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THE STRUCTURE OF DEMAND BY TUCSON HOUSEHOLDS FOR RURAL WATER-BASED OUTDOOR RECREATION

by

Carter Madison Cox

A Thesis Submitted to the Faculty of the

DEPARTMENT OF AGRICULTURAL ECONOMICS

In Partial Fulfillment of the Requirements
For the Degree of

MASTER OF SCIENCE

In the Graduate College

THE UNIVERSITY OF ARIZONA

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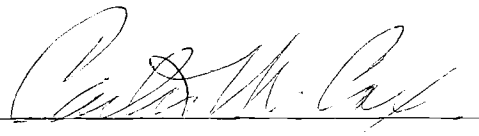
SIGNED: 

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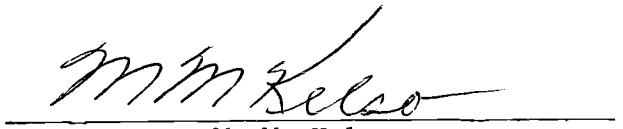

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TABLE OF CONTENTS

	Page
LIST OF TABLES	vii
LIST OF ILLUSTRATIONS	x
ABSTRACT	xi
CHAPTER	
I INTRODUCTION	1
The Problem	2
The Questions to be Answered by the Analysis	2
Conceptual Framework of the Analysis	6
II PROCEDURE	9
Data Collection	14
Pretest and the Sample	16
Selection of the Sample	17
The Schedule	18
Data Processing	19
III SUMMARY PROFILE OF TUCSON OUTDOOR RECREATION	23
Survey Results	24
Socioeconomic Characteristics	24
Age of Household Heads	26
Education of Household Heads	26
Occupation of Household Heads	29
Income of Households	29
Household Size and Composition	32
Workweek of Households	35
Household Vacations	37
Other Household Background Information	39
Summary of Socioeconomic Characteristics	41
Activity Analysis of Household Outdoor Recreational Involvement	42
Area Involvement in Household Outdoor Recreation	55
IV ANALYSIS OF NON-URBAN, WATER-BASED OUTDOOR RECREATION	59
Recreation Area Sets	60
Activity Analysis at Area Sets	64

TABLE OF CONTENTS--Continued

Page

Length and Frequency of Visit 69
Time of Visit 83
Income 86
Household Size 90
Workweek of the Household Head 92
Age of the Household Head 94
Other Factor Analysis 97

V HOUSEHOLDS AND THEIR RELATION TO AREA SETS 101

Analysis of Household Visitation Patterns 106
Single Area Visits Compared to Visits to Any Pair of Areas and to Multiple of Areas 107
Comparison of Single Area Visitations Involving Area 1 Only, Area 3 Only, and Area 4 Only 110
Comparison Between All Pairs Which Include Area 4 and All Pairs Which Do Not Include Area 4 113
Compairson Between All Area Pairs Which Include Set 4 and Multiple Area Patterns 116
Comparison of Single Area and Multiple Area Visitation Patterns 117

VI SUMMARY AND CONCLUSIONS 120

Outdoor Recreating Households in Tucson: Summary of the General Survey 121
The Kind and Quantity of the Outdoor Recreation Products Acquired 121
Socioeconomic Characteristics of Outdoor Recreating Households 123
Nonrespondents to the Recreation Survey 125
Non-Urban, Water-Based Recreation Purchases by Tucson Households: Summary 127
The Non-Urban, Water-Based Recreation Market: Summary 128
The "Market Basket" of Rural, Water-Based Recreation Purchases: Summary 135
Conclusions 140
Critical Appraisal of the Methodology 144

APPENDIX I: PRECONDITIONING LETTER 148

APPENDIX II: THE GENERAL SCHEDULE: TUCSON METROPOLITAN AREA OUTDOOR RECREATION SURVEY 150

TABLE OF CONTENTS--Continued

Page

APPENDIX III: FIRST (GENERAL) CODE FOR RECREATION SURVEY SCHEDULES 161

APPENDIX IV: SECOND OR NON-URBAN, WATER-BASED RECREATION CODE FOR COMPUTER PROGRAM 169

APPENDIX V: COMPUTER PROGRAM RUNS 174

APPENDIX VI: FIVE PATTERNS OF AREA VISITATION RELATED TO THIRTEEN ATTRIBUTES OF RECREATORS INCLUDING CHI-SQUARE TESTS OF SIGNIFICANCE FOR EACH COMPARISON 177

LIST OF REFERENCES 248

LIST OF TABLES

Table		Page
1.	Tucson Metropolitan Outdoor Recreation Survey Results	25
2.	Households by Age of Head	27
3.	Households by Highest School Grade Completed by Head	28
4.	Households by Occupation of Head	30
5.	Households by Income Class	31
6.	Households by Size	33
7.	Household Composition by Number of Children at Home	34
8.	Households by Workweek of the Head in Days	36
9.	Households by the Average Number of Hours Worked per Week by the Head	38
10.	Households by Place of Residence of the Head During Childhood (Under 18 Years of Age)	40
11.	Participation in Outdoor Recreational Activities by Households	43
12.	Household's Favorite Activity Under Existing Constraints	46
13.	Influence Limiting Activity Participation	48
14.	Favorite Activity of Households if Unconstrained in Choice	49
15.	Frequency of Household Participation in Outdoor Recreational Activities	52
16.	Time Spent in Each Participation in Each Outdoor Recreational Activity	54
17.	Households by Site Visitations for Outdoor Recreation	57
18.	Water-Based Recreation Sites in the Tucson Metropolitan Survey	62

LIST OF TABLES--Continued

Table		Page
19.	Hypothesized Area Sets of Water-Based Recreation Sites . . .	63
20.	Participation in Water-Oriented Activities by Households . .	65
21.	Frequency Distribution of Water-Based Recreating Households According to Set Visitations and Activity Participation	68
22.	Area Involvement by Water-Based Recreating Households . . .	70
23.	Length and Frequency of Visits by Tucson Households to All Non-Urban, Water-Based Recreation Areas	73
24.	Visitation Characteristics at the Five Area Sets	75
25.	Area Sets by Number of Visits and Visit Days Related to Length of Stay	77
26.	Households by Length of Visit Characteristics at the Area Sets	80
27.	Households by Frequency of Visit Characteristics at the Area Sets	82
28.	Time of Visit at the Area Sets	85
29.	All Households Classified by Participation in Water-Based Recreation and Annual Income	87
30.	Households Visiting Either of the Five Areas at Least Once Distributed by Area and by Income; and Households Visiting Any Area Distributed by Income	89
31.	All Households Classified by Participation in Water-Based Recreation and Household Size	91
32.	Households Classified by Participation in Outdoor Recreation and by Workweek Characteristics	93
33.	Households Classified by Participation in Outdoor Recreation and by Age of Household Head	95
34.	Households Visiting Each Area Classified by Age of the Household Head	96
35.	Favorite Recreational Activity of Non-Urban, Water-Based Recreators	99

LIST OF TABLES--Continued

Table		Page
36.	Household Visitation Patterns	103
37.	Area Visitation Patterns Compared to Income by Households	138
38.	Area Visitation Patterns Compared to Education of Household Head	139
39.	Area Visitation Patterns Compared to Size of Household . . .	141

LIST OF ILLUSTRATIONS

Figure Page

1. Participation in Outdoor Recreational Activities by Households as a Percent of all Households 44

ABSTRACT

This study represents an attempt to meaningfully ascertain and describe the pertinent relationship between activities, area visitation, and socioeconomic factors as they pertain to non-urban, water-based outdoor recreation demand by Tucson households. The objective was to conceptualize these relationships into a framework amenable to the subsequent application of demand theory.

In order to accomplish this goal, the basic approach was to view the population as one of sets and subsets. Permanent residents of Tucson were viewed as either recreators or nonrecreators. Further, they were differentiated in terms of whether they were urban or non-urban recreators as well as whether they were land or water-based outdoor recreators. The focal subset was that of non-urban, water-based outdoor recreators. Subsequently, this subset itself was viewed as being composed of further subsets of differing area and activity patterns. By describing the socio-economic characteristics and recreational activities of the non-urban, water-based recreator subsets and the areas associated with their visits and activities, the outcome has been description of the water-based outdoor recreation market in Tucson and of participants in that market.

CHAPTER I

INTRODUCTION

The demand for outdoor recreation in Arizona and the United States has, and is, increasing by tremendous amounts. The nature of this demand and the form in which it is and will be manifested represents a broadening spectrum of claims on the natural resource environment. The Bureau of Outdoor Recreation predicts that between the years 1965 to 2000, participation in outdoor recreation in the United States will have increased by 160 percent (U. S. Department of the Interior, 1967). These predictions imply broad social changes and the requirement for new adaptations of the natural environment.

Due to the nature of the resources necessary for many outdoor recreation activities, the need for future planning and preparation is vital if these apparent desires of society are to be satisfied. Broadly considered, resource planners are or will be concerned with the economic value of resources used for purposes of recreational activities as compared with the value generated by these resources in alternative uses. Unfortunately, at the present time economic evaluation of recreational use of resources is complicated by the relatively unknown nature of outdoor recreational demand, the lack of conceptualization of recreation within the context of currently existing economic theory, and the lack of data with which meaningful analyses can be conducted.

This research, which is the first of an integrated research program by the Department of Agricultural Economics and the Department

of Watershed Management at The University of Arizona relative to outdoor recreation in Arizona, is concerned primarily with the analysis and subsequent methodological problems associated with a study of non-urban, water-oriented outdoor recreational participation by Tucson Metropolitan Area households.

Tucson, Arizona, which is located in the southeastern portion of the state, has a population of 279,000 (Population Study Tucson, 1966). Thus, Tucson, one of the two major population centers in Arizona, comprises 17 percent of the total state population. The use of Tucsonans as a base from which data could be obtained and analyzed was considered pertinent because it represents a relatively high proportion of the total state population, as well as providing a base location from which a fixed population could be observed and analyzed in terms of its outdoor recreational behavior in the natural environment in which it exists.

The Problem

The problem confronting this research was that of meaningfully describing and ascertaining the pertinent relationships between activities, area visitation, and socioeconomic factors as they pertain to water-based outdoor recreational demand. The multidimensional aspects of outdoor recreation, the complexity of meaningfully determining and classifying the relevant factors, and the conceptualization of hypotheses all posed methodological problems for the purpose of this research.

The Questions to be Answered by the Analysis

At this stage of research relative to outdoor recreation in Arizona, the questions to be answered are seemingly unsophisticated, but difficult

to come to grips with in terms of meaningful solutions. The problem focuses upon basically five areas of inquiry. These are:

1. Describing the outdoor recreational behavior of Tucson households.
2. Determining the significant socioeconomic parameters from those hypothesized as being related to outdoor recreational behavior.
3. Describing Tucson household recreational behavior in terms of water-based recreation areas as typified by location relative to Tucson, intensity of involvement, and type of involvement.
4. Classification of water-based recreation areas by similarity of type, intensity of involvement by users, and by distance from Tucson.
5. Ascertaining the interrelationship between socioeconomic parameters of households, water-based recreation area involvement, and distance factors.

What this study attempts to provide subject to the five areas of inquiry is: (1) area classifications of non-urban, water-based recreational localities in terms of the nature of recreation demand by Tucson households, (2) development of the area and socioeconomic factors which underlie these demands and thus define these classifications, and (3) a critical evaluation of the methodological techniques used in obtaining data and testing hypotheses. Answering these questions will thereby serve as the basis on which the subsequent stages of the long-range research program may proceed.

Area classification is an important aspect of outdoor recreational demand analysis. One might consider that area visitation is similar to the purchase of a commodity in an economic sense. Yet, just as a person

might buy a product for a multiple of uses or purposes, so might an individual or household visit a recreation site for the purpose of participating in a multiple of recreational activities. The question remains as to just what is the basis for defining a product--in this case, a water-based recreation area. Clawson (Clawson and Knetsch, 1966, pp. 36-40) defines recreational areas in terms of three types: (1) intermediate areas, (2) user-oriented areas, and (3) resource-oriented areas. He differentiates these types on the basis of location, activity, time of visit, size of the area, and agency responsibility. However, he readily admits that these areas may fall into a continuum rather than being precisely distinct. What has been done in this study is to consider specifically non-urban, water-based recreational areas used by Tucsonans for water-oriented activities.[1] This essentially eliminates areas that Clawson would define as user-oriented since these areas are principally urban in geographic location. That leaves intermediate- and resource-based areas under his classification system. The nature of this study assumes that it is a resource, namely water, which in some manner motivates recreational participants to visit these areas. This, in effect, tends to diminish the distinction between the latter two classifications since it is a resource in a non-urban location that is being studied.

Determination of the correct procedure for area classification in terms of the water resource consideration is, in turn, related to

---

1. Non-urban, water-based outdoor recreation in this study was defined to be household participation in a water-oriented recreational activity at a water-based recreational site located in a non-urban area.

the second facet of the study, which is to determine what factors seem to define the posited area classifications as they relate to demand. Given that each area grouping of sites is a combination of lakes and reservoirs of roughly the same distance from Tucson, the theoretical costs of travel and time expenditure to get to the various sites that compose an area are approximately equivalent for recreationists who live in Tucson. However, this is only the case in an absolute sense as real money cost and real time sacrifice will be relative to income, workweek, and other factors. What this study hopes to show is that participation or visitation at these areas is definable in terms of socioeconomic factors and activity preferences--that both of these however, may be co-related--and that as a result, some one or some combination of these factors and the socioeconomic characteristics of the recreationists tend to define areas and activity participation. Income, age of the household head, length of the workweek, education, household size, and number of children are all conceivably factors which will influence recreation area classification from the standpoint of demand.

The third phase of this study is to evaluate the methodological techniques employed relative to effectiveness and applicability to future economic recreational demand studies. This is, perhaps, the important contribution of this analysis. Due to the fact that no data were initially available for the analysis desired in this study, a method for generation of information was necessary. The survey, which subsequently was conducted, provided a sufficient quantity of data to warrant the use of computers. Therefore, the range of research methods employed is broad enough in scope to provide a critical evaluation of techniques as they might relate to future research efforts.

Conceptual Framework of the Analysis

Conceptualization of the framework within which human decision-making relative to participation in outdoor recreation occurs, though difficult, is necessary in order to ascertain the data necessary for analysis. The data gathered must be associated with a prior concept or abstraction of what is believed to be pertinent rather than merely ad hoc information for information's sake alone. In this manner, posited hypotheses may be tested.

In analyzing recreation in an economic context, the extent of the unknown--conceptual as well as factual--is vast. The need is to define the product involved, the nature of the production process, and the manner and degree to which an objective value may be attached to the product by consumers. In this context, water-based recreation is conceived as being a product of the natural resource environment. The "product" is believed to be an intangible "thing" which is sensed through direct involvement in an activity and felt by the consumer as an experience. As such, the "product" is both produced and consumed simultaneously; hence, production occurs only in the act of consumption.

This approach might best be envisioned in terms of a specific recreational site, such as a particular portion of a reservoir which has been established as a swimming area. If, in fact, no one is swimming, then no recreational product is being produced. The nonstorable potential for swimming is, at best, being wasted. Yet, the instant someone utilizes this reservoir for swimming, production of the intangible product begins while simultaneously the swimmer is in the act of consumption.

Since sites or areas suitable for differing types of recreational experience are not limitless in terms of availability to consumers, scarcity exists. Product scarcity is a function then, of the resistances confronted by consumers to availability of sites or areas at which the recreational product may be consumed. These resistances are manifested in area location fixity, travel costs, costs of producing facilities, opportunity cost of the sites, and the leisure time constraints of the consumer.

Once these resistances or degrees of resistances are conceived to be a "cost" to the consumer for the recreational product, the applicability of economic theory becomes apparent. That is to say, the different types and different degrees of intensity of involvement relative to "cost" mean that overcoming these resistances or the payment of the "costs" for the "product" by consumers brings about a marginal value for the resource inherent in the production process. This permits conceptualization of recreation demand as a conventional demand function which enables the deduction of all the characteristics of such a function--elasticities, determinants, quantities, demand shifters, etc.

In this analysis, no classic demand function was derived, but rather within the limitations imposed by the data the cross relationship of classes of socioeconomic parameters with classes of areas defined by type and intensity of recreational involvement were tested by nonparametric statistics--largely chi-square tests. This was done to uncover the significant and meaningful attributes and parameters related to a conceptualized demand function. Later, more elaborate and definitive research will be confronted with the actual derivation of the classic demand function for such recreational demand.

The research reported herein, then, may be characterized as a first attempt to classify Tucson area, non-urban, water-based recreational products in a manner amenable to the subsequent application of relevant demand theory to such products.

CHAPTER II

PROCEDURE

Having conceptualized outdoor recreation within a framework believed to be meaningful, it was necessary to obtain data relevant to these concepts to ascertain and, hopefully, to test their validity. Since initially no such data were available, this was the first procedural problem.

As mentioned previously, it is not enough simply to gather information. The data ideally must be associated within a relevant conceptual framework and aimed at establishing or refuting that framework as a set of hypotheses. Insofar as current knowledge permitted, this was the case in this analysis.

Normally, in economic demand studies the product consumed is some quantifiable unit that theoretically bears a functional relationship to the economic variables, price of the product and income of the consuming units, the price of substitute products, and the tastes and preferences of the consumers. Hence, the product will be quantifiable and homogeneous, and the economic variable will be expressed through the market system in a money measure. Unfortunately, these qualities are not as yet available for purposes of recreational demand studies. At the outset, one is faced both with ascertaining the "product" and relating it to a quantifiable unit. Clawson (Clawson and Knetsch, 1966, p. 33) appears to consider the total recreational experience of the consuming unit to be the unit of study in demand analysis. Other writers

consider the composite of activities experienced on the recreation site as expressed in visitor days to be the quantity unit. From among these possibilities, the decision in this research was simply to consider visits as the unit of measure. Thus, participation in an outdoor recreation activity at a water-based recreation area by a household, or some member of that household, constituted a manifestation of demand. What they did, how often they did it, and at how many localities was seen as a measure of the type and intensity of involvement. This would permit ordinal, if not cardinal, measure of consumption.

The household, as an aggregate of its members, was considered to be the consuming unit for the purposes of this study. This definition was decided upon, among other reasons, on the assumption that this was the economic unit from which recreational decisions are made or sanctioned. Even though individual members of the household may participate in differing forms of recreation at different times, the household is the income generating unit "that finances recreation out of a common household budget, and the decision to participate is presumed to have household sanction," (U. S. Department of the Interior, 1962, Report 24). Utilizing the household as the aggregate consuming unit was also expeditious relative to drawing a sample from the Tucson Metropolitan Area. It enabled the use of Polk's Tucson City Directory (1966) as a listing of the population (households) from which sample units could be randomly selected.

Determination of the economic variable of "cost," as conceptualized, was perhaps the most difficult variable to derive. Essentially, all areas used for recreational purposes are "free" to the public.

Exceptions to this generalization are found in private sectors of recreation and in some federally administered areas. Yet, the former sector is insignificant relative to Tucson area, water-based recreation and the latter areas do not manifest a market derived price or "cost" to the consumer. As a result of these considerations, the analysis required determination of proxy measures. Most often recreational demand studies utilize travel costs and on-site expenditures in this context (Clawson and Knetsch, 1966, pp. 48-52). In this study a central location, Tucson, was selected from which distances to recreational sites could be measured. Thus, distances to each site are assumed to be equal for all consuming units. This being the case, the relative real cost of the water-based recreation experience at a single site differs between households in terms of the magnitude of other factors such as household income, size of the household, the amount of leisure time, and the preferences of households for certain activities or composites of recreational activities.

Of singular significance in recreational demand analysis is the relationship between income and the leisure time budget. These two variables serve further to differentiate recreational analysis from other types of economic research. The time dimension is inherently involved in the purchase of recreational "products." Preceding the decision to consume recreational experiences has been a prior decision in which, theoretically, the marginal utility of working to generate income has been equated with marginal utility of not working and obtaining leisure time. Once having made this decision, the consuming unit has the task of allocating a given quantity of discretionary leisure time

among alternative uses such that the maximum level of satisfaction will be derived. In this sense, a limited block of leisure time has economic implications.

An example will, perhaps, illustrate the economic implications of leisure time as related to recreational demand. Assume that two households, A and B, have the same income, stay the same length of time at the same site, have the same socioeconomic characteristics, and pay the same price in terms of travel costs and on-site expenditures. Additionally, they participate in the same activity composite. If household A has a small block of available leisure time than does B, then A is, in real terms, paying more for the recreational experience. This, of course, involves valuating leisure time and adding this to the proxy prices already determined.

Anthony Scott (1965), in discussing the theoretical aspects of evaluating game resources, considers the question of leisure time in terms of opportunity costs. That is, the value of time spent going to an area for recreational purposes, as well as the value of the time spent on the site, should include not only the travel costs and on-site expenditures involved but also the opportunity cost of income foregone. This approach is complicated by institutional factors such as job characteristics, which tend to hamper the derivation of the opportunity cost itself.

With these almost insurmountable difficulties in mind and realizing the objectives of this study, the determination of leisure time in this study was far from complete. Leisure time was ascertained by determining the workweek of the household heads, the vacation

characteristics of the household heads, and the manner in which days off occurred for households. This last factor seemed relevant in that a household might receive its "days off" in a combination of ways, any one of which might influence activity and area participation, For example, two household heads might have a five-day workweek. The two days one individual has off could come in sequence, whereas for the other they might be separated. The household with days off coming together could spend two joint days recreating while the household with separated days off would be limited to one day at a time--a greater time constraint.

Since the data generated in this fashion concerning leisure time would at best only establish possible effects, no sophisticated analysis was undertaken. Economic evaluation of the expenditure of the leisure time budget was beyond the scope of this research, but it must be incorporated in future economic demand studies if a meaningful demand function for the recreational product is to be derived.

The additional socioeconomic factors of household size, age of the household head, number of children, occupation of the household head, and education of the household head were also considered to be important factors influencing the demand for water-based outdoor recreation. Ascertaining these characteristics in association with manifested activity preferences by households would thus permit insight into the nature of consumer purchases and the evaluation of alternative recreational products.

Any future economic analysis of recreation must concern itself not only with the nature of the recreational product, but the substitutability of products as well. A major portion of this research is involved

with recreation area analysis. Inasmuch as the recreation product is both produced and consumed at a site, the determination of similar patterns of area recreational experience by Tucson households was conceived to be a procedure by which product and product substitutes could be determined.

Data Collection

The survey method, normally a necessity in obtaining primary social data, was the procedure followed in this research for obtaining the necessary information about the consuming units. This subsequently required consideration of (1) the method of conducting the survey--personal interview, mailed questionnaire, etc.; (2) the formulation of the schedule; (3) specification of the sample size and the sample design; (4) editing, coding, and tabulating specifications; (5) the type of analysis to be carried out; (6) consideration of the number of interviewers available; and (7) the inclusion of time and cost factors involved (Ferber and Verdoon, 1962).

Selection of the appropriate sample design was predicted by the desire to incorporate the use of certain statistical techniques in order to make inferences relative to posited hypotheses. Having no ex ante knowledge concerning the actual nature of the source of information nor the variability of the parameters of interest, simple random sampling was seen as the most plausible design for this survey. Random sampling is a sample selection in which each elementary unit in the population has an equal probability of occurring in the sample.

Considerable definitional problems arose in terms of what was the appropriate population and elementary unit for sampling purposes.

Having chosen random sampling as the method for sample selection, it was necessary that the population be finite and applicable for determining water-based outdoor recreation in Arizona. Additionally, the population had to be in listable form and be relatively easy to sample due to clerical, temporal, and financial constraints.

After considering all of these factors, it was decided that the population would be defined as all of the permanently residing households in the Tucson Metropolitan Area. This included households that had recently moved to Tucson and its adjacent areas, such as South Tucson and the Catalina Foothills. The elementary unit within this population was the household.

Technically, addresses were randomly selected; however, it was the household which was considered to be the source of data and the address merely a mechanism to select households. It should be mentioned that data relative to household demand were expanded in that an attempt was made to ascertain who, within the household, normally participated in the various outdoor recreation activities. This permitted a somewhat more specific analysis of household behavior and demand for recreational products.

The method of conducting the survey was based on temporal and financial limitations, as well as the unknown nature of the population to be interviewed. It was felt that the personal interview approach would meet both these requirements and permit greater flexibility in the schedule design. This flexibility, along with the fact that personal interviews normally result in a higher proportion of usable schedules as compared with mailed questionnaires, was considered ample reason for

adopting the former approach. The aim in this case was to adopt the most efficient technique for generating the maximum amount of quality data.

Since there were no prior data that could be utilized in a time series sense, the research was by necessity a cross-sectional analysis. This meant that consideration had to be given to the period of time to be analyzed. This required (1) that the period be long enough to determine the seasonal recreational behavior of the population, and (2) not so long that the problem of recall or memory was detrimental to the validity of the information obtained from households. With these factors in mind, the households in the sample were interviewed in terms of their outdoor recreational experiences during the year preceding the interview.

Pretest and the Sample

No indicators were available as to how a survey of this type would be received by the population being sampled. Additionally, the applicability of the schedule and the variability of the pertinent parameters were unknown. This latter unknown precluded estimation of the standard deviations of sample statistics which were necessary for determining the sample size that would generate statistical validity. For these reasons, a pretest of 100 sample units was conducted.

Results of the pretest indicated that, for the most part, the schedule as formulated was applicable and with a few minor changes it was used in the expanded sample. The pretest also indicated that a multiple of sample sizes would be required due to the large number of sample statistics and the range of standard deviations involved. A sample size large enough to incorporate all of the possible sizes

required for the estimation of parameters of the population at the 90 percent level of significance would require that 275.1 households be interviewed.[2] Temporal and financial constraints of the research precluded obtaining a sample of this size. However, by combining the 100 interviews of the pretest with a further sample of 150, the estimates would be close enough for purely descriptive purposes. Subsequently, this decision was implemented and the total sample size of this analysis was established at 250 household interviews.

Selection of the Sample

In both the pretest and the expanded sample, the method of sample unit selection was the same. From a random numbers table, pairs of numbers were selected. These pairs thus corresponded to a page number and a household address as found in the Directory of Householders, Section III of Polk's Tucson City Directory (1966). The first number of the randomly selected pair represented the page and the second number the address on that page. In the event that the selected address contained a commercial firm or a household that was not permanently residing in Tucson, an alternate was selected. If the selected household was on vacation at the time of the initial interview, an attempt was made to reinterview that household when they returned.

---

2. Estimation of the sample size was based on data obtained on the pretest. Selecting the statistic that would require the largest sample size, the computation was as follows: (Cochran, 1964)

$$t = 1.66 \qquad p = .52 \qquad d = .05$$

$$N_o = \frac{t^2 pq}{d^2} = \frac{(1.66)^2 \ (.52) \ (.48)}{(.05)^2} = \frac{.6879}{.0025} = 275.1$$

In both the pretest and the expanded sample, a preconditioning letter (Appendix 1) was sent to the household head at the selected address. This letter stated the purpose of the study, the interviewer's name, and the manner in which the interviewee had been selected.

The Schedule

The schedule (Appendix 2) used in the survey was essentially divided into three sections. These included questions relative to outdoor recreational activity participation, the recreational areas at which these activities took place, and the socioeconomic characteristics of the households in the sample. The schedule was designed in a manner which would permit description of who was doing what and where with regards to outdoor recreational demand. Since the survey was a combined effort by two disciplines at The University of Arizona, it was necessary that the information obtained be broad in content so that appropriate extractions could be made by the two research departments.

Throughout the schedule, both structured and unstructured questions were utilized. With regard to activity participation, area visitation, and socioeconomic factors, the bulk of the data was obtained through structured questions. This permitted specific responses relative to information that was of direct concern to the objectives and also facilitated coding of the generated data. The outdoor recreation activities of interest were considered to be the 20 activities as defined by the Outdoor Recreation Resources Review Commission Report 19 (U. S. Department of the Interior, 1962). The areas of interest were developed from the predominant recreation sites--both water-based and land-oriented--within and without Arizona which were believed to be an integral part of the Tucson household outdoor recreation demand.

Unstructured questions were utilized for obtaining information relative to household preferences and explanatory portions of some questions. For example, households were asked which area was their favorite and why this was so. They were also asked which factor was the most important in influencing activity participation and area visitation and why this was the case. These types of questions were incorporated in the schedule in order to obtain insight into the influence certain factors have on recreational behavior.

Data Processing

Due to the diversity of data obtained from the schedules, it was necessary that a procedure for machine tabulation be developed. Consequently, all of the pertinent data were coded, Appendix 3, and placed on IBM electronic data processing cards. Coding is the process whereby numerical symbols are assigned to data to permit manipulation by electronic data systems. This procedure permitted compilation of most of the gross characteristics of the survey through the use of sorting and tabulating machines.

At this point the schedules of data secured from non-urban, water-based recreators in the sample were separated from those obtained from all other households. This procedure was followed in order that the demand for water-based outdoor recreation could be determined exclusive of general demand for outdoor recreation. The demand for water-based recreation was believed to be a function of preferences for activities, the availability of sites, and socioeconomic characteristics of the households. Gross data appeared to substantiate this concept. Since the recreational product is produced and consumed at a

site, or perhaps some multiple of sites, the description of existing patterns of recreational behavior was conceived to be a means of determining what comprised the recreational demand for water-based recreational experiences, as well as some insight into the substitutability between sites relative to such recreational patterns. This would provide greater product definition for purposes of future demand analysis by assuming that sites exhibiting similar patterns of recreation can be studied as sets producing a single recreation product.

On the basis of these notions, sites were combined into area sets of similar distance from Tucson and activity-use patterns. These sets of sites (or "areas") were then related to household characteristics of those households which visited within or among them.

In processing the data for this phase of the analysis, water-based recreating households were recoded (Appendix 4) according to the site set or area classification and the factors which were believed to be defining the nature of the demand at these area sets. These factors were (1) activity participation, (2) length of stay, (3) frequency of visitation, (4) time of visitation, (5) income, (6) household size, (7) number of children, (8) education and age of the household head, and (9) workweek of the household head. The degree to which these factors differ from area to area would indicate the appropriateness of the classification.

Having hypothesized five area sets of water-based recreation sites and the factors believed to be associated with demand for them, an appropriate statistical device was needed to test the applicability of these classifications. Testing these hypotheses was complicated by

virtue of the number of possible combinations of area sets that households could conceivably visit; hence, be demanding. Realizing that five area sets have 150 different permutations, the data had to be analyzed to ascertain how many such combinations actually were contained in the sample. It turned out that 29 possible combinations of sets actually appeared in the data.

The chi-square test for independence of samples was used as the statistical device for testing the degree of independence of each set of recreational sites from all other sets, thus testing the hypothesis that each posited set constituted a single recreational product. However, with 29 subsets involved, the numbers and frequency distributions of related parameters were inconclusive in a majority of cases. The tests did, however, provide indications as to the validity of the area set classifications. In order to utilize this statistical device, the data were processed through a modified chi-square test program on a Fortran 2 computer.

The chi-square test for independence of samples is a nonparametric technique for making inferences that may be used to determine the significance of differences between two presumably independent groups. This test involves the hypothesis that two groups differ with respect to certain posited characteristics and, therefore, with respect to the frequency with which members of the groups will be found to exhibit particular patterns of recreational behavior (Siegel, 1956, pp. 104-111). The test compares (1) the observed frequency with which a single group's members exhibit certain relevant characteristics with, (2) the frequency expected on the basis of simple chance. The greater the difference

between the observed and the expected frequencies with which a descriptive datum appears in an hypothesized class, the larger is the chi-square value and the more likely that the two groups differ with respect to their classifications. When this is the case, rejection of the null hypothesis that the two sets or classes are not independent of each other can be rejected.

The limitations of the chi-square test of independence of groups when used in this study principally related to the magnitude of the expected and observed frequencies in the various classifications. If no fewer than 20 percent of the matrix of cell frequencies contain less than five individuals and if no cells contain less than one, the test is generally applicable. Unfortunately, in most of the chi-square tests run in this study these requirements were not met.

CHAPTER III

SUMMARY PROFILE OF TUCSON OUTDOOR RECREATION

In this chapter, a summary of the data generated by the Tucson Metropolitan Area Outdoor Recreation Survey is presented. The chapter is divided into the following parts: (1) general socioeconomic characteristics of households in the sample, (2) the recreation activities participated in by the households, and (3) the areas that Tucson households visited for outdoor recreational purposes. The survey and the data obtained were directed toward describing who engages in outdoor recreation, what activities they prefer, and where these recreationists go to participate in outdoor recreation.

In this summary profile, all households supplying able questionnaire information are included and they are classified as outdoor recreating households if they participated in one or more of the 20 forms of outdoor recreation, as defined by the Outdoor Recreation Resources Review Commission.[3] Many of these forms of outdoor recreation, notably swimming, horseback riding, bicycling, playing games, and attending sports events and concerts are urban oriented. Hence, this chapter describes the involvement of Tucson households in all forms of outdoor

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3. These activities were swimming, fishing, picnicking, sightseeing, hunting, boating, water-skiing, camping, hiking, nature walks, horseback riding, bicycling, driving for pleasure, walking for pleasure, playing golf, playing baseball, playing tennis, playing other outdoor games, attending outdoor sports events, or attending outdoor concerts.

recreation, whether urban or non-urban and whether land- or water-based. Chapters IV and following will analyze these same households with respect to their involvement in non-urban, water-based outdoor recreation.

Survey Results

From the 250 randomly selected household addresses interviewed during the period of July 1967 to September 1967, 204 interviews were usable. This constituted 82 percent usable responses from the total survey. Table 1 represents the completed sampling results and indicates that refusals and vacationers were 18 percent of the survey.[4] Contained in the 204 households from which usable schedules were obtained were 187 households which were recreators.[5] They comprised 92 percent of the usable samples, while the 17 nonrecreating households were the complement or eight percent of the usable schedules.

Socioeconomic Characteristics

The socioeconomic characteristics of each household considered were age, education, occupation, income, household size and composition, workweek, vacation time, and miscellaneous background characteristics. Primarily, these characteristics are those of the household head as this is the most practical procedure for presenting the gross socio-economic characteristics of the households interviewed.[6] In cases where

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4. An attempt was made to reinterview addresses in which the household was initially on vacation. If they were still on vacation at the close of the survey, they remained a nonusable schedule.

5. A household was defined as a recreating household if within the year preceding the interview, one or more individuals in the household participated in one or more of the 20 outdoor recreation activities.

6. If the household consisted of a man and wife, the male was considered to be the head. Where there was but one adult and children, the adult was considered to be the household head.

Table 1. Tucson Metropolitan Outdoor Recreation Survey Results.

Survey Identity	Total Number	Percent of 250
Households interviewed	250	--
Refusals	42	16
Vacationers	4	2
Usable schedules	204	82

the characteristics of other members of the household are pertinent to specific types of analysis, these characteristics are presented.

Age of Household Heads

The age characteristic of each household was defined as being the age of the household head. Ages have been combined into five-year ranges, beginning with 15 years and extending through 75 years. Those falling below and above these ranges have been combined into "below 15 years" and "above 75 years." Table 2 shows the frequency distribution of household heads as to age and indicates the percent of each age group which were recreating households. The distribution tends to be normal, however, the upper limit is considerably larger than the lower one. Since this question was asked in terms of the age of household heads and Tucson is a notable health and retirement community, this situation is not surprising. In the 75 and over group, nonrecreators predominate while in all other age classes recreators hold this position. Due to the size of the sample and the small number of nonrecreators, generalizations that may be made relative to nonrecreators and their age characteristics are limited. However, the data reveal that 76 percent of all nonrecreating household heads are over 60 years of age.

Education of Household Heads

Table 3 classified households by the highest grade in school completed by household heads. The data indicate that 26 percent of the household heads had completed eight or less grades of formal education, whereas another 38 percent had attended or completed high school and 35 percent had attended or completed college or received postgraduate

Table 2. Households by Age of Head.

Age Class	Number	Percent	Percent that are Recreators
Under 15	0	0	0
15-19	1	.5	100
20-24	11	5	100
25-29	20	10	100
30-34	14	7	100
35-39	22	11	100
40-44	23	11	91
45-49	21	10	100
50-54	22	11	100
55-59	19	9	89
60-64	16	8	94
65-69	12	6	83
70-74	10	5	100
75 and over	13	6	38
Total	204	100[a]	92

a. On this and several other tables in this chapter percentages fail to total 100 because of rounding errors.

Table 3. Households by Highest School Grade Completed by Head.

School Grade Completed	Number	Percent	Percent that are Recreators
0	1	.5	100
1	22	11	95
2	0	0	0
3	0	0	0
4	3	1	100
5	3	1	67
6	4	2	75
7	2	1	100
8	18	9	89
9	7	3	71
10	8	4	75
11	8	4	75
12	56	27	96
College			
13	14	7	86
14	13	6	100
15	6	3	100
16	23	11	96
Postgraduate			
17 and over	16	8	94
Total	204	100	92

college education. Whereas 64 percent of all households have completed 12 or less years of schooling, 76 percent of the heads of households that do not recreate are found in this group.

Occupation of Household Heads

In Table 4, household heads are classified by occupation, as defined by the United States Census of Population 1960, Arizona (U. S. Department of Commerce, 1961). The two major occupational groups in the sample are professionals and craftsmen, foremen, and kindred workers. The retired group is quite large and some 30 percent of this group are nonrecreators. Interestingly, this 30 percent includes 82 percent of all nonrecreating households.

Income of Households

Table 5 represents the distribution of average gross annual incomes before taxes when tabulated in classes with a range of $3,000. The results imply a normal distribution; however, the group receiving less than $3,000 is disproportionately large compared to the group receiving $15,000 and over. This can, in part, be explained by the high proportion of retired households in the sample. Recreating households are principally in the middle and upper income groups, which tends to support the hypothesis that outdoor recreation is positively correlated with income. Supporting this notion is the fact that 88 percent of the nonrecreators in the sample were in the group receiving less than $3,000. Because nonrecreating households tend to be concentrated in the age group over 60 years of age, in the retired occupation class, and in the income class receiving less than $3,000, it can be deduced that

Table 4. Households by Occupation of Head.

Occupation	Number of Household Heads	Percent of Total	Percent that are Recreators
Professional	47	23	100
Retired	46	23	70
Craftsmen, foremen, and kindred workers	31	15	100
Managers, officials, and proprietors (except farm)	19	9	100
Salesworkers	12	6	100
Operatives and kindred workers	11	6	100
Service workers (except private households)	10	5	100
Unemployed	9	4	78
Clerical and kindred workers	8	4	88
Laborers (except farm and mining)	5	2	100
Student	5	2	100
Private household workers	1	.5	100
Farmers and farm managers	0	0	0
Farm laborers and farm foremen	0	0	0
Total	204	99.5	92

Table 5. Households by Income Class.

Income Class	Number of all Households	Percent of all Households	Number of Outdoor Recreators	Percent of Outdoor Recreators
Less than $3,000	48	24	33	69
$3,000 to $5,999	41	20	40	98
$6,000 to $9,999	62	30	61	98
$10,000 to $14,999	32	16	32	100
$15,000 and over	21	10	21	100
Total	204	100	187	92

nondemand for outdoor recreation tends to be a function of advanced age and low retirement income.

Household Size and Composition

Table 6 represents the frequency distribution of household sizes in the sample. Table 7 describes the composition of the households in terms of numbers of children present. Generalizations concerning the relationships of household size and composition with participation in outdoor recreation are difficult due to the small number of nonrecreators in the sample, which brings about very small numbers of nonrecreators in most of the household size groups. However, 90 percent of all nonrecreating households contain no children and 82 percent of all nonrecreating households are composed of one or two persons. It might appear, therefore, that participation in outdoor recreation tends to be related to the presence of children. Recalling, however, that nondemand for outdoor recreation has been shown to be concentrated among the elderly and retired households, it may be more reasonably deduced that it is this characteristic, rather than numbers of children present, that explains nonrecreation behavior. It would appear that if elderly and retired households were eliminated from the classifications in Tables 1 and 7, the proportion of recreating households among those composed of one or two persons without children would be as high as among those households that contain children. Of course, because of the manner in which household participation in outdoor recreation was defined in this study, it cannot be said whether the presence of children motivates the household as a unit to participate in outdoor recreation (though this deduction would appear a reasonable hypothesis) or whether the presence of children

Table 6. Households by Size.

Household Size	Number of Households	Percent of Total	Percent that are Recreators
1	43	21	74
2	47	23	94
3	26	13	96
4	37	18	97
5	17	8	100
6	16	8	100
7	10	5	90
8	6	3	100
9	0	0	0
10 or more	2	1	100
Total	204	100	92

Table 7. Household Composition by Number of Children at Home.

Number of Children	Number of Households	Percent of Total	Percent that are Recreators
0	91	45	84
1	23	11	100
2	37	18	100
3	20	10	95
4	15	7	100
5	7	3	100
6	8	4	88
7	1	.5	100
8	2	1	100
9 or more	0	0	0
Total	204	99.5	92

merely increases the probability that some one member of the household will have taken part in an outdoor recreation activity, thus placing his household in the recreating class.

Workweek of Households

Table 8 indicates the distribution of households in terms of the length in days of the workweek of the household head. In the four-, five-, six-, and seven-day categories essentially all of the households were recreators. The rather large number of household heads in the sample having no days of work during the week can be attributed to the relatively large proportion of Tucson households that are in the retired category, though this class also includes the unemployed. Within this category are found 94 percent of the nonrecreating households. Underlying this factor is the interrelationship of retirement with advanced age, health restrictions, and low incomes--all of which help to explain the lack of participation in outdoor recreation. It is interesting to note that even the category in which the head works seven days a week, all households are recreators, thus further substantiating that it is age, retirement and low income that explains nondemand for outdoor recreation.

To obtain a further picture of the work characteristics of Tucson households in order to derive some conception of the leisure time budget within which recreation decisions are made, the sequence of days of work was obtained as well as the average number of hours of work per week. This approach was taken on the assumption that household heads could work five days a week but have differing sequences of days off. Some household heads could receive their days off together, as on Saturday and Sunday, while others might have Sunday off and some day

Table 8. Households by Workweek of the Head in Days.

Days of Work	Number of Households	Percent of Total	Percent that are Recreators
0	57	28	72
1	0	0	0
2	0	0	0
3	0	0	0
4	3	1	100
5	104	50	100
6	34	17	97
7	9	4	100
Total	204	100	92

other than Saturday. Such being the case, the hypothesis was posited that differing recreational behavior could conceivably result due to the effect on the leisure time budget. A further look at these relationships will be taken in subsequent chapters where non-urban, water-based outdoor recreation is examined.

Table 9 describes the household distribution relative to the average number of hours worked per week by the household head. The greatest number of household heads are in the 40 to 44 hours per week range, which closely corresponds with the five-day workweek reported by 104 household heads. Broadening the range somewhat, the data indicate that 56 percent of the household heads worked on the average of from 40 to 49 hours per week. This range contains 55 percent of the households defined as recreators. Only in the households in which the head does not work by virtue of being retired or unemployed is there a significant number of nonrecreators. In this range, 94 percent of the nonrecreators are found.

Household Vacations

Another important facet of the block of leisure time available to households is the amount of vacation time available to the household. The approach followed in this study was to ascertain the amount of paid vacation received by household heads, as well as whether or not the vacation was taken all at once or spread through the year. The incidence of paid vacation might be viewed as not only available time for recreational purposes, but also as a type of subsidy relative to income. Insofar as income influences recreational participation, paid vacations should induce recreation through the increased income effect. Whether

Table 9. Households by the Average Number of Hours Worked per Week by the Head.

Average Hours of Work per Week	Number of Household Heads	Percent of Total	Percent that are Recreators
0	55[a]	27	73
1-24	0	0	0
25-29	1	.5	100
30-34	0	0	0
35-39	8	4	100
40-44	91	45	100
45-49	22	11	95
50-54	11	5	100
55-59	2	1	100
60 or more	14	7	100
Total	204	99.5	92

a. This number contains 46 retired and 9 unemployed heads of households.

or not the vacation is taken all at once or spread through the year should likewise influence the type and area of recreational participation. Several weeks of vacation in a block would permit recreation at resource-oriented areas, while the same amount of vacation spread through the year might mean that households would be induced to seek areas and to participate in activities found in areas close to Tucson (Clawson and Knetsch, 1966). These hypotheses are dealt with further in later chapters where the analysis of non-urban, water-based outdoor recreation is reported. Summarizing the gross data relative to the various aspects of household vacations, 45 percent of the sample households received a paid vacation; while in all, 71 percent of the sample took a vacation, paid or otherwise, during the year preceding the interviews, of which only 48 percent took their vacations during the summer months. In terms of length, 68 percent of the households with paid vacations received from two to three weeks. Approximately the same percent of the sample indicated they took their vacation all at once as opposed to spreading it throughout the year.

Other Household Background Information

To round out the general picture of households in the sample in terms of probable influences upon outdoor recreation, the background of the head of the household and of the spouse, if one existed, was determined. Information of this nature included (1) place of residence in childhood (under 18 years of age), (2) participation in outdoor recreation as a child (under 18 years of age), and (3) household membership in an outdoor-oriented club (that is, Rod and Gun Club, Boy Scouts, Girl Scouts, etc.). Table 10 shows the place of residence of the household

Table 10. Households by Place of Residence of the Head During Childhood (Under 18 Years of Age).

Location	Number of Household Heads	Percent of Total	Percent that are Recreators
On farm	35	17	89
Rural nonfarm	7	3	86
Village or city under 10,000	53	26	92
City 10,000 to 99,999	41	20	93
City 100,000 to 499,999	33	16	88
City 500,000 or more	35	17	97
Total	204	99	92

head during that individual's childhood (under 18 years of age). The distribution of recreators and nonrecreators among the locations is relatively uniform. Due to the small number of the latter in the sample, however, no valid generalizations can be made. The broad definition of outdoor recreation used in this research, as well as handling the data in gross terms, could preclude any relationship being manifested. The most applicable approach relative to childhood environment and participation in recreation might be to specify particular activities such as camping or fishing and correlate this with the household head's environment in earlier years. Seventy-nine percent of the household heads that recreated indicated they had participated in outdoor recreation as a child under 18 years of age. Only 57 of the households, or 27 percent of the sample, contained anyone that was a member of an outdoor-oriented club, such as the Boy Scouts or Girl Scouts.

Summary of Socioeconomic Characteristics

This section has described the socioeconomic characteristics of Tucson households presumed to be related in some way to their outdoor recreation behavior. Though it has presented much information of interest about Tucson households, only a very small part of it has been found to be relevant to their total outdoor recreation involvement.

Essentially, all Tucson households participate in some degree in outdoor recreation as it was defined for purposes of this chapter. The only significant class of nonrecreators was found to consist of those childless households in which the head was retired (or unemployed), was elderly, and received low incomes. In every classification, most

of the nonrecreating households turned up in one of these or some closely intercorrelated class.

This is hardly surprising when one considers the broad spectrum of activities defined as outdoor recreation. If one child in the household swam at least once in a public or private pool, played baseball in the Little Leagues, or went for a hike with the Boy Scouts; or if one adult played a game of golf or went to a high school or college football or baseball game; or if the family went on at least one picnic outing in an urban park or in Sabino Canyon, the household was classed as an outdoor recreator. Obviously, only the elderly, for reasons of infirmity or lack of motivation or of income, might be expected to stay home or indoors. In general, that is about all that this chapter reveals about outdoor recreation by Tucsonans.

A further hypothesis of the study is, however, that if outdoor recreation involvement by these households is subdivided into urban and non-urban and the latter into water-based and land-based forms, significant differences in the socioeconomic characteristics of participating households in each class of outdoor recreation will be revealed. The rest of this chapter examines these hypotheses relative to all recreating households and the following chapters examine their validity as to water-based, non-urban recreation.

Activity Analysis of Household Outdoor Recreational Involvement

In Table 11 and Figure 1, the number of households having at least one member who participated in one or more of the defined outdoor recreational activities is shown.

Table 11. Participation in Outdoor Recreational Activities by Households.

Activity	Number of Households Participating	Percent of all Households
Picnicking	129	63
Sight-seeing	115	56
Swimming	110	54
Driving for pleasure	102	50
Attending outdoor sports events	73	36
Camping	68	33
Fishing	64	31
Walking for pleasure	58	28
Hiking	44	22
Bicycling	44	22
Playing other games	40	20
Playing baseball	39	19
Hunting	38	19
Boating	34	17
Playing golf	34	17
Nature walks	34	17
Horseback riding	32	16
Attending outdoor concerts	26	13
Playing tennis	25	12
Water-skiing	13	7
Total	1,122[a]	
Nonrecreating households	17	8

a. Represents the total number of activities participated in by one or more households.

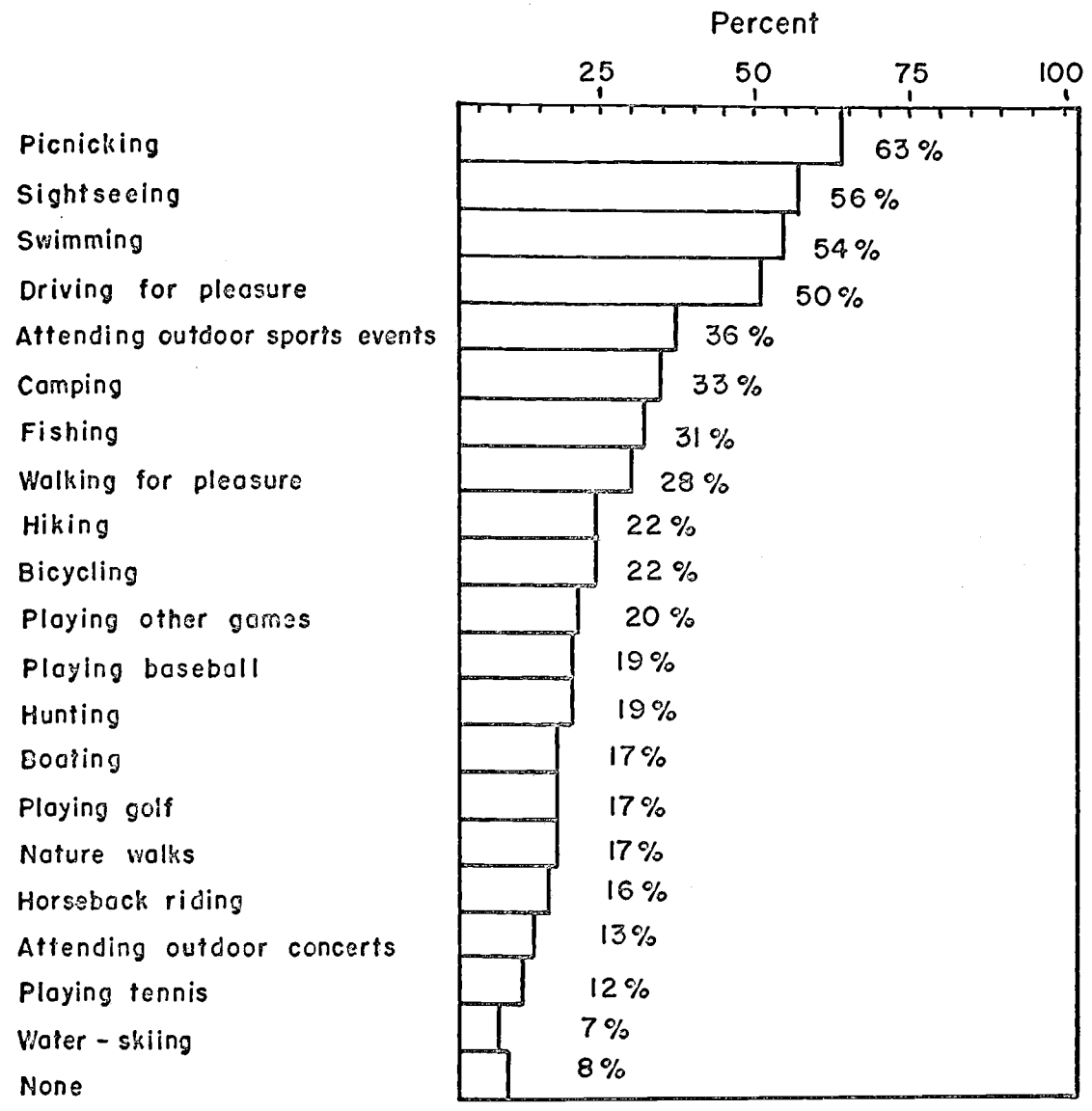

Figure 1. Participation in Outdoor Recreational Activities by Households as a Percent of all Households.

The four activities most frequently participated in were picnicking, sight-seeing, swimming, and driving for pleasure. These activities accounted for 456 or 41 percent of the 1,122 activity participations reported by all households. The four activities of the next most frequent participation were attending outdoor sporting events, camping, fishing, and walking for pleasure. These four activities accounted for another 263 or 23 percent of the 1,122 reported participations. These eight activities accounted for 719 or 64 percent of all 1,122 household activity participations. The remaining 12 activities accounted for the remaining 36 percent of outdoor recreation activity involvement.

To obtain information relative to the household's favorite activity, and hence some notion of preferences, two approaches were followed. One approach was to ask what was the household's favorite activity under currently existing constraints of time, money or other commitments and the other was to inquire as to its favorite activity if it could do what it wanted to with no constraints. In the first approach, the respondent was asked simply to indicate the household's presently favorite activity. Table 12 shows the results of this question. In this instance, the four most frequently chosen favorite activities were swimming, picnicking, camping, and fishing. The first two activities were among the four activities most frequently participated in by households while camping and fishing ranked sixth and seventh. However, this is plausible considering the time involved in camping and the availability of adequate fishing areas within a close proximity to the Tucson Metropolitan Area. What seems likely is that even though the household may have a favorite activity, there were a number of possible constraints which precluded this preference from being manifested.

Table 12. Household's Favorite Activity Under Existing Constraints.

Activity	Number of Households	Percent of all Households
Swimming	35	17
Picnicking	32	16
Camping	26	13
Fishing	16	8
Attending outdoor sports events	12	6
Driving for pleasure	11	5
Sight-seeing	6	3
Horseback riding	5	2
Walking for pleasure	4	2
Playing golf	4	2
Boating	4	2
Playing other games	3	1.5
Playing baseball	3	1.5
Attending outdoor concerts	3	1.5
Playing tennis	3	1.5
Nature walks	2	1
Water-skiing	2	1
Hiking	1	.5
Hunting	1	.5
Bicycling	0	0
No preference given	31	15
Total	204	100

In order to probe into this hypothesis further, a number of factors or influences which were posited as having a major bearing on outdoor recreation activity participation were submitted to the respondents and they were requested to choose those which they felt prevented them participating in their favorite outdoor activity. The list submitted included: (1) cost of the activity, (2) available time, (3) available facilities, (4) family responsibilities, (5) family participation, (6) differing recreational interests within the family, (7) religious responsibility, (8) health, and (9) other factors. Table 13 shows that available time, cost of the activity, health, and available facilities were the four most important influences on existing activity participation. When asked to select the one most important influence, respondents more frequently chose available time, cost of activity, health, and religious responsibility in that order as the important influences.

The second approach to the question of household preferences was asked in terms of what respondents would do if they could do as they pleased. Under these conditions, the households were free of the constraints of available time, cost of the activity, health, and other influences on activity participation. Table 14 shows that sight-seeing and camping were by far the preferred activities if no constraints stood in the way. Notable is the choice of sight-seeing as the activity most frequently selected under these conditions.[7] This activity was

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7. Sight-seeing in this sense includes travel. Many people indicated that if they could do as they pleased, they would travel more. For the purpose of this study, this activity was considered to be sight-seeing.

Table 13. Influences Limiting Activity Participation.

Influence	Number of Households	Percent of all Households
Available time	135	66
Cost of activity	97	48
Health	59	29
Available facilities	48	24
Family participation	35	17
Religious responsibility	34	17
Family responsibility	28	14
Differing recreational interests in the family	23	11
Other	15	7
Total[a]	474	--

a. Total number will not equal 204 due to the fact that more than one influence could be selected by a single household.

Table 14. Favorite Activity of Households if Unconstrained in Choice.

Activity	Number of Households	Percent of all Households
Sight-seeing	56	27
Camping	39	19
Fishing	18	9
Swimming	12	6
Picnicking	11	5
Playing other games	10	5
Attending outdoor sports events	9	4
Horseback riding	5	2.5
Boating	5	2.5
Hunting	5	2.5
Playing golf	3	1.5
Water-skiing	3	1.5
Walking for pleasure	2	1
Playing baseball	2	1
Attending outdoor concerts	2	1
Playing tennis	2	1
Nature walks	1	.5
Hiking	1	.5
Driving for pleasure	0	0
Bicycling	0	0
No choice given	20	10
Total	204	100

not one of the more frequently selected favorite activities under conditions of constraint, but this seems logical in light of the importance attached by respondents to the factors of available time and cost of the activity. Sight-seeing is normally resource-oriented (Clawson and Knetsch, 1966, p. 37); therefore, the magnitude of variable costs of travel and on-site expenditures are subject to the availability of these types of resources. Since these types of sites are normally more distant from urban centers, even in the case of Tucson, the influence of available time and the cost of engaging in the activity are of considerable importance. The inclusion of travel within the category of sight-seeing adds to the significance of these factors relative to participation because this implies visitation to areas at a distance from Tucson.

Interestingly, 99 respondents or 57 percent of those individuals having a favorite activity preference under constrained conditions changed their choice of favorite activity under the second or "unconstrained" approach to this question. Predominately, this was a shift from some other activity to sight-seeing (including travel). Also, 17 respondents had no choice under the initial conditions, but did have a choice when constraints were removed. The data obtained from this portion of the survey, although lacking statistical verification, tend to indicate the importance of the factors of available time, cost of the activity, and indirectly, income relative to preferences for outdoor recreational activities. Assuming this to be the case, these factors will be important demand shifters for outdoor recreational activities.

Two other important facets of outdoor recreational behavior in Tucson include (1) the frequency within the year preceding the survey

that households participated in various activities, and (2) the average length of time these households spent participating in outdoor recreational activities. In order to ascertain the frequency that families engage in various activities, respondents were asked to indicate the approximate number of time that anyone within the household had participated in the activities within the year preceding the time of interviewing. These data were then classified in the following categories: (1) one to three times, (2) four to seven times, and (3) eight or more times. Table 15 shows the tabulation of the resulting data and indicates the most frequently mentioned frequency category for each of the respective activities. For 12 of the 20 activities, most households reporting any participation reported doing so one to three times during the course of the year; in the other eight activities--all of which might be characterized as urban outdoor recreation activities--most households reporting participation indicated they did so more than eight times. One would expect to find more frequent indulgence in urban-based, outdoor recreation.

Table 15 reveals that of the eight outdoor activities frequently engaged in as shown in Table 11 and described more fully on page 45, four (picnicking, sight-seeing, camping, and fishing) were participated in by most households one to three times during the year and the remaining four (swimming, driving and walking for pleasure, and attending outdoor sporting events) were participated in by most households eight or more times. It may be significant that of the four activities in which the largest proportion of all households take part, but in which they tend to participate relatively infrequently (one to three times) are, except

Table 15. Frequency of Household Participation in Outdoor Recreational Activities.

Activity	Frequency					
	1-3 Times		4-7 Times		8 or More Times	
	Number of Households	Percent of Households Participating	Number of Households	Percent of Households Participating	Number of Households	Percent of Households Participating
Picnicking	69[a]	54	26	20	34	26
Sight-seeing	66[a]	57	25	22	24	21
Swimming	35	32	10	9	65[a]	59
Driving for pleasure	32	31	8	8	62[a]	61
Attending outdoor sports events	21	29	8	11	44[a]	60
Camping	46[a]	68	14	20	8	12
Fishing	33[a]	52	17	27	14	20
Walking for pleasure	21	36	4	7	33[a]	57
Hiking	26[a]	59	8	18	10	23
Bicycling	14	34	1	2	27[a]	64
Playing other games	14	35	3	7	23[a]	58
Playing baseball	15	38	3	8	21[a]	54
Hunting	18[a]	47	11	29	9	24
Boating	18[a]	53	7	21	9	26
Playing golf	10	29	6	18	18[a]	53
Nature walks	17[a]	50	9	26	8	24
Horseback riding	21[a]	64	4	12	8	24
Attending outdoor concerts	19[a]	73	4	15	3	12
Playing tennis	10[a]	40	6	15	9	36
Water-skiing	8[a]	62	0	0	5	38

a. Indicates the frequency category most often mentioned by those households reporting participation in the activity.

for picnicking, relatively costly in time and/or money. Finding picnicking in this category is somewhat surprising, but may be due to the fact that though most households on an outing may include "picnicking," they do not consider it a picnic but something else--fishing or driving for pleasure, for example. Picnicking, as an activity engaged in for its own sake, may be relatively infrequent though engaged in occasionally by many households.

It may also be significant that of these eight more frequently engaged in activities, all but swimming and possibly walking for pleasure, are of the sort one would expect usually to be participated in by the household as a unit. Though our data do not permit testing this seemingly plausible hypothesis, they do tend to indicate that outdoor recreation participation is most often a family or household affair.

Having looked at the frequency with which sampled households participated in various activities, the usual length of time of each participation was next determined. Table 16 indicates the interval of time, whether hourly or daily, that the majority of households spent each time it participated in each of the activities. The eight activities most often participated in eight or more times during the past year were engaged in principally in the interval of one to four hours. Because of their urban character and relative accessibility to the population, the relative frequency and short time duration of participation in these eight activities is not surprising.

Summarizing activity participation by the households in the sample, those in which the greatest number of households participated--picnicking, sight-seeing, swimming, and driving for pleasure--were that

Table 16. Time Spent in Each Participation in Each Outdoor Recreational Activity.

Activity	Prevalent Interval of Participation	Number of Households	Percent of all Households Participating in Activity
Picnicking	1-4 hours	67	52
Sight-seeing	1-4 hours	57	50
Swimming	1-4 hours	100	93
Driving for pleasure	1-4 hours	69	68
Attending outdoor sports events	1-4 hours	71	97
Camping	1-4 days	61	90
Fishing	1-4 days	38	59
Walking for pleasure	1-4 hours	55	95
Hiking	1-4 hours	29	66
Bicycling	1-4 hours	39	89
Playing other games	1-4 hours	32	80
Playing baseball	1-4 hours	36	92
Hunting	1-4 days	22	58
Boating	1-4 days	19	56
Playing golf	1-4 hours	27	79
Nature walks	1-4 hours	29	85
Horseback riding	1-4 hours	30	94
Attending outdoor concerts	1-4 hours	26	100
Playing tennis	1-4 hours	23	92
Water-skiing	1-4 hours	7	54

activities (1) normally required a relatively short period (one to four hours) of leisure time, (2) that lent themselves to family participation, (3) that required few special skills for participation, (4) that were associated with accessible facilities, and (5) that, except for driving pleasure, were high on the preference list of activities the household preferred under both constrained and unconstrained assumptions. Noticeable exceptions in manifested behavior relative to expressed preferences are camping and fishing. Both were high on the preferences of households, but the factors of available time and cost of the activity probably precluded them from being in the top four activities in which the households actually participated. The four activities in which Tucson households participated most frequently are evenly divided between the one to three and the eight or more frequency classes. Sight-seeing and picnicking, both primarily non-urban in character, fall in the former and swimming (primarily urban) and driving for pleasure fall in the latter categories.

Area Involvement in Household Outdoor Recreation

To ascertain where Tucson households engaged in outdoor recreation, particularly non-urban recreation, a list of 34 sites of interest to the research program was presented to the sample respondents and they were asked to indicate which of the sites any member of the household had visited within the year preceding the interview.[8] Relative to each

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8. Visitation by a household will hereafter be defined to mean that at least one person from the household visited the site within the year preceding the time of interviewing.

site visited, the respondent was asked to indicate (1) what outdoor recreation activities were participated in at that site, (2) who from the household visited the site, (3) how often during the past year the site was visited, and (4) when the visits normally occurred (weekdays, weekends, or vacations).

Table 17 shows the number of households from the sample that visited each of the 34 sites within the last year. Two categories, other sites in Arizona and other sites outside Arizona, were inserted in order to determine recreational participation that may have occurred at sites other than the 34 of specific interest to the research. Within the other sites in the Arizona category are found the urban, water-based recreation sites--all other are non-urban. One hundred and six households, or 52 percent, of the sample visited in one or the other of the two above mentioned sites for recreational purposes within the past year. These are sites of significant importance in terms of recreation, but for the purposes of this study are essentially unanalyzed. Future research will, no doubt, want to explore these sites further.

Table 17 is divided into two types of classifications--water-oriented sites and land-oriented sites. Subsequent analysis in this thesis will concern itself only with Tucson household participation in outdoor recreation at non-urban, water-oriented sites tabulated in Part I of Table 17.

Complementing this study of non-urban, water-based recreation participation will be a study of non-urban, land-oriented outdoor recreation that will be conducted in the Department of Watershed Management at The University of Arizona.

Table 17. Households by Site Visitations for Outdoor Recreation.

Site	Number of Households That Visited Each Site	Percent of all (204) Households That Visited Each Site
I. Water-Oriented Sites		
Rose Canyon Lake	43	21
Pena Blanca Lake	37	18
Parker Canyon Lake	25	12
Riggs Lake	5	2
Ruby Lake	3	1
Rucker Lake	1	.5
Roosevelt Lake	23	11
San Carlos Lake	8	4
Apache Lake	22	11
Canyon Lake	14	7
Bartlett Reservoir	6	3
Saguaro Lake	4	2
Horseshoe Lake	3	1
Painted Rock Reservoir	2	1
Lake Pleasant	0	--
White Mountains	57	28
Lake Mead	10	5
Lake Powell	6	3
Lake Havasu	6	3
Lake Mary	6	3
Lake Mohave	3	1
Gulf of California	12	6

Table 17. (Continued).

Site	Number of Households That Visited Each Site	Percent of all (204) Households That Visited Each Site
II. Land-Oriented Sites		
Sites in Arizona		
Mt. Lemmon	112	55
Sabino Canyon	106	52
Tucson Mountains	85	42
Madera Canyon	49	24
Chiricahua Mountains	11	5
Patagonia	9	4
Graham Mountains	8	4
Others in Arizona[a]	64	31
Sites Outside Arizona		
California	31	15
Rocky Mountains	4	2
Pacific Northwest	1	.5
Others Outside Arizona	42	21
Total	818[b]	--

a. Because each household may go to several different sites, this total exceeds 204. On the average, each household interviewed visited 818/204 or 4 sites.

b. Includes urban, water-based outdoor recreation visits within the Tucson urban area.

CHAPTER IV

ANALYSIS OF NON-URBAN, WATER-BASED OUTDOOR RECREATION

The analysis of water-based outdoor recreation follows two approaches. In the first approach reported in this chapter, the recreation sites are described and classified into five "area sets" and three areas then compared relative to the characteristics of the households which visit them and the nature of the visits made to them. Since any single household could visit one or a multiple of the five "area sets," the second approach reported in the following chapter classifies and compares households relative to their visitation patterns as between single area sets, pairs of such sets, and multiples of such sets. In other words, this chapter takes the areas as the base of comparison and determines area set characteristics relative to household visits, while the following chapter takes the households as the base of comparison and attempts to distinguish among households as to area set visitation patterns.

Data obtained from the Tucson Metropolitan Area Outdoor Recreation Survey indicated that, during the year preceding the survey, 116 households visited at least one of the non-urban, water-based recreation areas considered in the study.[9] Thus, 57 percent of all 204 households, or

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9. A non-urban, water-based recreation household is defined to be a household which, within the preceding year, had at least one member who visited one or more of the rural areas defined by this study to be water-based for the purpose of participating in one or more water-oriented outdoor recreation activities. Subsequently, water-based recreation will refer to non-urban, water-based recreation only.

62 percent of all 187 outdoor recreators were defined as non-urban, water-based outdoor recreating households.

Recreation Area Sets

For purposes of this research, the 20 non-urban, water-based recreational sites included in the study were classified into five major area sets according to two criteria--distance from Tucson and the principal outdoor recreational activities that occurred at each.

Relative to distance, the 20 sites were classified into three groupings designated as local lakes, middle distant lakes, and distant lakes.

Relative to recreational activities occurring at each, the middle distant sites were divided into three different area sets due to distinction in activities principally associated with each subset.

The products produced or activities purchased at the 20 recreation sites were found to include 9 of the 20 activities defined by the Outdoor Recreation Resources Review Commission. These activities were: (1) swimming, (2) fishing, (3) boating, (4) water-skiing, (5) camping, (6) nature walks, (7) hiking, (8) picnicking, and (9) sight-seeing. These activities were grouped into five major categories of activities. The first group was directly water-using in nature and consisted of swimming, pleasure boating, and boating associated with water-skiing. The second category, also directly water-using but of a different nature, comprised of fishing and boating associated with fishing. The third, fourth, and fifth groupings of activities were water-oriented but not directly water-using in nature. The third group was composed of camping, nature walks, and hiking. The fourth and fifth groups were picnicking and sight-seeing, respectively.

The five area sets considered in this research were composites of 20 different sites. Table 18 lists these 20 water-based sites, the principal activity participation by Tucson households at each site, and the distance category relative to Tucson that characterized each site. On the basis of these relationships, these 20 sites were combined into five distinct areas, as shown in Table 19. The middle distance lakes were differentiated from the Salt River Lakes primarily on the basis of the difference in activity orientation at these two sets. San Carlos and Roosevelt Lakes were sites where Tucsonans principally were demanding a fishing and boating recreational product. The Salt River Lakes, on the other hand, were sites at which the demand was for boating, water-skiing, and swimming--primarily at Apache and Canyon Lakes. The Colorado River lakes were sites where the principal activity participation by Tucson households was sight-seeing. Separation of the White Mountains into an individual set was based on the large number of recreation areas and activities available in that composite and its popularity as a "vacation" area. This tends to set the White Mountains apart as a particular aspect of the water-based recreation demand by Tucsonans.

The area sets were analyzed in terms of the following characteristics of the households that visited them--length of visitation, frequency of visitation, time of visitation, income, household size, work-week of the household head, and age of the household head. The number of children in the household was not considered separately, as originally planned, because this factor was interrelated with the household size. Education was also dropped from separate consideration as this tended to be correlated with the income level of households.

Table 18. Water-Based Recreation Sites in the Tucson Metropolitan Survey.

Site	Principal Activities at the Site	Distance Category
1. Riggs Lake	fishing	local lake
2. Ruby Lake	fishing, camping	local lake
3. Rucker Lake	fishing	local lake
4. Pena Blanca Lake	picnicking, fishing	local lake
5. Parker Canyon Lake	picnicking, fishing	local lake
6. Rose Canyon Lake	picnicking, fishing	local lake
7. San Carlos Lake	fishing, camping, boating	middle distance lake
8. Roosevelt Lake	fishing, boating	middle distance lake
9. Apache Lake	boating, swimming, camping	middle distance lake
10. Canyon Lake	boating, water-skiing	middle distance lake
11. Bartlett Reservoir	sight-seeing	middle distance lake
12. Painted Rock Reservoir	picnicking, sight-seeing	middle distance lake
13. Horseshoe Lake	fishing	middle distance lake
14. Saguaro Lake	fishing, swimming	middle distance lake
15. White Mountains	fishing, boating	middle distance lake
16. Lake Mary	sight-seeing	distant lake
17. Lake Havasu	swimming, boating, sight-seeing	distant lake
18. Lake Mohave	sight-seeing	distant lake
19. Lake Mead	sight-seeing	distant lake
20. Lake Powell	sight-seeing	distant lake

Table 19. Hypothesized Area Sets of Water-Based Recreation Sites.

Site	Set Name	Set Code Number
1. Riggs Lake 2. Ruby Lake 3. Rucker Lake 4. Pena Blanca Lake 5. Parker Canyon Lake 6. Rose Canyon Lake	Local lakes	Set 1
7. San Carlos Lake 8. Roosevelt Lake	Middle distance lakes	Set 2
9. Apache Lake 10. Canyon Lake 11. Bartlett Reservoir 12. Painted Rock Reservoir 13. Horseshoe Lake 14. Saguaro Lake	Salt River lakes	Set 3
15. White Mountains	White Mountain lakes and streams	Set 4
16. Lake Mary 17. Lake Havasu 18. Lake Mohave 19. Lake Mead 20. Lake Powell	Distant (Colorado River) lakes	Set 5

Activity Analysis at Area Sets

Analysis of activities purchased by households was pursued in terms of what the households normally did when they visited within or among the area sets. In this sense the study was attempting to determine what recreational product was usually purchased by each household at each location. Complicating this approach was the problem of multiple purchases of activities within a set or among sets of water-based areas. The question arises as to what is the product purchased when a household participates in a multiple of recreation activities at one area or at a multiple of areas. Handling this question was far from satisfactory. If a household participated in one or more of the activities in an activity set, it was tallied as participating in that activity set. If a household participated in a multiple of the activity sets, it was counted as participating in each of the appropriate activity sets. Thus, an activity set is considered to be a single activity; a household is tabulated once, but only once in a single activity set regardless of participation in more than one component activity in that set. However, it will be tabulated in each different activity set in which it may participate. Thus, the total of activity participations may be larger than the total number of participating households.

Table 20 shows the involvement in the five activity sets by all households participating in all outdoor recreation, urban and non-urban, compared to involvement in the same activity sets at specified non-urban area sets only. Water-based recreating households are rather evenly distributed among the water-oriented activities (with the exception of fishing) which would indicate a relatively broad range of products

Table 20. Participation in Water-Oriented Activities by Households.

Activity	All Households; Activities at all Urban and Non-Urban Locations		Number of Households Participating at Specified[a] Non-Urban Water-Based Area Sets	Percent of all Non-Urban Water-Based Recreators	Percent of all Households Participating at all Locations
	Number of Households Participating	Households			
1. Swimming, boating, water-skiing	157	77	56	48	36
2. Fishing	66	32	64	55	97
3. Camping, nature walks, hiking	146	72	56	48	38
4. Picnicking	129	63	59	51	46
5. Sight-seeing	115	56	51	44	44
Total activity involvements	613[b]	300	286[b]	247	47
Total households	204	100	116	100	57

a. See Table 19.

b. These figures will not total the number of households observed (204 and 116, respectively) because each household could engage in a multiple of activities.

being purchased by these recreators. Of interest is the difference between the number of households in the total sample which participated in these activities at all locations, urban and non-urban, compared to the number of non-urban, water-based recreating households which participated in them. There seem to be two ways to account for the differences between total participation and participation in non-urban water recreation only. First, a household that participated in these activities only within the urban area would not be included among the non-urban, water-based recreating households. Second, households participating in these activities exclusively at areas outside of Arizona which were not included among the area sets studied herein would not be included among the water-based recreation households either. The results indicate that only fishing is predominately an Arizona-wide, non-urban, water-based recreation activity. However, it is important to understand that this says only that most of the Tucson households which fished did so at one of the specified area sets whether or not they may also have fished at other areas outside Arizona within the preceding year as well. In the case of Activity Set 1 (swimming, boating, and water-skiing), the difference in extent of all location and non-urban area participation is, no doubt, in part explained by the number of households that contain individuals that swim only and then only at an urban location.

In Activity Sets 3, 4, and 5, the divergence between all location and non-urban area participation results from those households who participate only within the urban area, only at nonwater related areas, or outside the State.

In the balance of this chapter, the analysis will relate only to those households (116) that reported visitations to the non-urban, water-based recreation area sets.

Table 21 reports the frequency distribution of households by activity participation at the five area sets. From these distributions, it can be seen that the local lakes are demanded principally for picnicking and fishing. San Carlos and Roosevelt Lakes, the middle distance lakes, are principally used for swimming and for boating associated with fishing and water-skiing. Set 3, the Salt River lakes, are primarily demanded for swimming, boating, and water-skiing with a secondary demand for fishing. The primary demand at this set is manifested principally at Apache and Canyon Lakes. The White Mountains experience a broad spectrum of demands relative to outdoor recreation products or activities. There is relatively even distribution of household participation among swimming, boating, water-skiing, picnicking, sight-seeing, camping, nature walks, hiking, and fishing. The distant lakes, located primarily along the Colorado River, were visited by Tucson households principally for sight-seeing purposes.

When the frequency distribution of households visiting the various sets of areas is compared with activity participation at the various sets and, subsequently, subjected to a chi-square test of independence, the results tend to indicate that these sets are identifiable in terms of activities. There is reason to believe that the sets of areas are independent of one another on the basis of the activities that households demand from them and, in this sense, represent different recreational products.

Table 21. Frequency Distribution of Water-Based Recreating Households According to Set Visitations and Activity Participation.[a]

Area Sets Number	Area Sets Name	Households	Activity Sets 1 Swimming, Boating, Water-skiing	2 Fishing, Boating	3 Camping, Hiking, Nature Walks	4 Picnicking	5 Sightseeing	Combinations of Activity Sets 1-5 (1, 2)	(1, 4)	(2, 3)	(2, 4)	(4, 5)	(3, 4 & 5)	Percent of Total
1	Local lakes	Number	6	16	6	18	6	0	0	7	4	2	8	74
		Percent	.08	.22	.08	.24	.08	.01	0	.09	.05	.03	.11	100
2	Middle distance lakes	Number	7	7	2	1	5	0	0	3	0	0	1	26
		Percent	.27	.27	.08	.04	.19	0	0	.11	0	0	.04	100
3	Salt River lakes	Number	14	8	1	2	3	1	3	1	1	2	1	37
		Percent	.38	.21	.03	.05	.08	.03	.08	.03	.03	.05	.03	100
4	White Mountains	Number	3	9	11	2	12	1	13	2	0	1	2	56
		Percent	.05	.16	.19	.04	.21	.02	.23	.04	0	.02	.04	100
5	Distant lakes	Number	3	1	1	1	14	1	1	2	0	0	0	24
		Percent	.13	.04	.04	.04	.58	.04	.04	.08	0	0	0	100
Total			33	41	21	24	40	4	17	15	5	5	12	217[b]

a. When these frequency distributions are subjected to a chi-square test of independent groups, the results are significant at the five percent level (χ^2 calculated = 125.70; χ^2 with 40 Degrees of Freedom = 55.76).

b. This number will not total 116 because 65 households went to more than one set. See Table 22.

The extent to which households visited more than one of the area sets is worthy of consideration as it provides a measure or "index" of the degree to which non-urban, water-based recreating households tend to demand diverse area products. Table 22 shows the distribution of water-based recreating households according to the number of area sets visited by the households within the year preceding the survey. Forty-four percent of the households went to only one area and 56 percent visited some combination of areas. In this phase of the analysis, a household is counted if it visits an area set regardless of whether it has visited in other areas as well. Therefore, a household may be counted more than once in such tabulations. Assuming a household visited one and only one set, such tabulations would total 116 households. However, the tabulations by areas in this chapter total 217. Therefore, the extent to which 217 exceeds 116 is an index of the degree to which water-based recreating households visit more than one area. This concept is significant in demand analysis in that it may be taken to indicate the degree to which recreators (consumers) are visiting (purchasing) a number of different areas (products).

Length and Frequency of Visit

Ascertaining appropriate estimates for the length and frequency of visitation by households at the sets of areas was complicated due to the manner in which this information was originally obtained on the schedule. The length of stay at a single visit was determined in terms of hours or days, dependent upon how long the household normally stayed when it visited a single site. Since a household might visit a multiple

Table 22. Area Involvement by Water-Based Recreating Households.

Number of Area Set Visits	Number of Households	Percent of Total Water-Based Households	Area Involvement Measure	Area Involvement Index
One area	51	44	51	1
Two areas	37	32	74	2
Three areas	21	18	63	3
Four areas	6	5	24	4
Five areas	1	1	5	5
Total	116	100	217	1.9

of sites within a set and a multiple of sets as well, a method for taking this into account had to be derived.

The frequency of visiting a site was obtained on the schedule in terms of the following three ranges: (1) one to three times during the year, (2) four to seven times during the year, and (3) eight or more times during the year. This form was inapplicable for conducting the desired analysis due to the set and subset problem. Therefore, a method had to be devised for converting these ranges into a value from which separate frequency ranges by area sites could be summed. This would permit derivation of the number of aggregate visits households made to the various sets and when combined with the length of stay, would provide an estimate of visit days to the sets of areas.

In resolving these issues, the length of stay per visit was converted in all cases to days. The hourly visits were considered in all cases to be a single day visit and all other multiple day visits were tabulated according to the number of days each represented. Converting the hourly visits to a day visit did not appear to be harmful to the results since the significant point in terms of area demand was whether they were principally in demand for day or for overnight use.

More heroic, perhaps, is the way the frequency of visit ranges were converted to absolute values. The one to three visit category was converted to a value of 1.4 visits on the average during the year. The basis for this value was that of interviewer estimates as to the number of households in the one to three range who actually visited an area only once. Recall suggested that at least two-thirds of the people in this range only went one time. Assuming this estimate to be correct,

this leaves the other one-third going on the average of two times during the year; if this influence is weighted with the majority within the range who went once, the average value of 1.4 was determined. Using this value tends to lower the upward bias of the midpoint value and makes the aggregate estimate of visits more meaningful. The four to seven range was converted to five visits per year, a figure slightly below the midpoint of the range. The open-ended range of eight or more was tabulated in terms of eight visits during the year, a definite downward bias; but since the numbers in this category are small, it does not significantly bias the aggregate results.

On the basis of these conversions, households were recorded according to the length of visit they reported as their usual behavior and the frequency with which these visits occurred. Table 23 shows the results generated by this procedure for all water-based recreating households. It reveals that water-based recreators made approximately 607.0 visits during the year to the water-based recreational areas. The average frequency of visits per household was 5.23 times within the year. On the basis of the total number of visit days that the 116 households made during the year, which was 1,008.6, the average number of visit days to water-based recreational areas per household was 8.7 days. This means that the average length of visit per visit during the year was 1.66 days. Table 23 also indicates that most of the visits made by households were day visits. Sixty-one percent of the visits were in this category. Of interest is the fact that though a relatively small percentage of the total number of visits resulted from two-day trips, this generated some 354.8 visit days which was 35 percent of the total

Table 23. Length and Frequency of Visits by Tucson Households to All Non-Urban, Water-Based Recreation Areas.

Length of Visit in Days	Frequency of Visits	Percent of Total Number of Visits	Number of Visit Days	Percent of Total Number of Visit Days
1	377.0	61	377.0	37
2	177.4	30	354.8	35
3	27.4	5	82.2	8
4	4.2	1	16.8	2
5	1.4	.2	7.0	1
6	0	0	0	--
7	14.0	2	98.0	10
8 or more	5.6	.6	72.8	7
Total	607.0	99.8[a]	1,008.6	100

a. Percent totals will not necessarily add to 100 due to rounding errors.

number. This would imply that in terms of days of use, the two-day visitors are demanding almost as much from the area as are the more frequent day visitors. In other words, even though the two-day visitors come into the recreational market fewer times during the year, they still demand an almost equivalent quantity of the recreational product output as do the one-day visitors.

Analysis of the individual area sets reveals a diversity of visitation characteristics. This would tend to add credence to the hypothesis that the area sets embody differing recreation products for consumers. Table 24 shows the visitation characteristics at each of the five area sets. As was expected, the local lakes received the most visits by Tucson households, but the shortest length of stay per visit. The White Mountains, on the other hand, though not visited as often, experienced an average length of stay per visit--such that the total number of visit days was approximately equivalent to the number at the local lakes. If the total number of visit days generated at an area set can be taken to be some measure of consumption (hence, production) of the recreational product, then these two sets, one nearby and one at a considerable distance, produced roughly the same output in terms of the Tucson market area. Which of the two areas embodies greater value to the consumer would hinge on the elements of cost involved. Intuitively, it would seem that the White Mountains would involve larger "costs" in overcoming the accessibility factor for Tucsonans; hence, it would be generating a larger total value product as a recreation resource than the local lakes. This question would have to be explored more explicitly, however, before any tested statements concerning this point could be made.

Table 24. Visitation Characteristics at the Five Area Sets.

Area Set	Number of Households Which Visited the Set	Number of Household Visits per Year	Percent of Household Visits per Year	Average Frequency of Visits per Household per Year	Number of Visit Days per Year	Percent of Visit Days per Year	Average Number of Visit Days per Household per Year	Average Length of Visit per Visit
Local lakes	74	250.4	41	3.38	301.8	30	4.08	1.21
Middle distance lakes	26	65.4	11	2.52	111.2	11	4.28	1.70
Salt River lakes	37	135.0	22	3.65	203.6	20	5.50	1.51
White Mountains	56	105.4	17	1.88	301.6	30	5.39	2.86
Distant lakes	24	50.8	8	2.12	90.4	9	3.77	1.78
Total	217[a]	607.0	100	--	1,008.6	100	--	--

a. This number will not total to 116 as individual households were visited in more than one set. See Table 22.

The Salt River lakes, among which Apache and Canyon Lakes are the dominant suppliers of recreational products for Tucson consumers, were visited by 37 households from among the 116 water-based recreating households. These 37 households were unusual in that, on the average, they manifested an annual frequency of visits (3.65) and an annual number of visit days per household (5.50) that were higher than for any other class of households visiting any other areas. The unique character of the behavior of these households probably is related to the nature of the recreational product produced and consumed at those lakes. The product at Apache and Canyon Lakes was principally water-skiing and/or boating. A preference for this type of activity will be greatly affected by the supply of facilities that produce it. Apache and Canyon Lakes are the water impoundments closest to Tucson that are highly suitable for water-skiing; thus, households with a strong preference for this activity tend to avail themselves of these areas. What accounts for the intensity of demand associated with this activity by these households, as measured by their strong propensity to participate, is not revealed by the data analyzed in this study.

Table 25 indicates the visit and visit day characteristics of water-based recreating households at the area sets in terms of the length of visit. In all but one of the area sets, the White Mountains, a majority of the visits were one-day outings. In the White Mountains, a majority of the visits were two-day outings.

Visits and visit days within different sets appear to be related to distance and the type of use within the area set. It was expected that the local lakes would be principally one-day use areas.

Table 25. Area Sets by Number of Visits and Visit Days Related to Length of Stay.

Area Set	Length of Stay in Days	Number of Visit Days	Percent of Total Visit Days in the Set	Number of Visits	Percent of Total Visits in the Set
Local lakes	1	218.6	72	218.6	87
	2	41.2	14	20.6	8
	3	21.0	7	7.0	3
	4 or more	21.0	7	4.2	2
Total		301.8	100	250.4	100
Middle distance lakes	1	39.2	35	39.2	60
	2	44.0	40	22.0	34
	3	8.4	8	2.8	4
	4 or more	19.6	17	1.4	2
Total		111.2	100	65.4	100
Salt River lakes	1	70.6	35	70.6	52
	2	120.4	59	60.2	45
	3	12.6	6	4.2	3
	4 or more	--	--	--	--
Total		203.6	100	135.0	0
White Mountains	1	19.2	6	19.2	18
	2	112.0	37	56.0	53
	3	40.2	13	13.4	13
	4 or more	130.2	44	16.8	16
Total		301.6	100	105.4	100
Distant lakes	1	29.4	33	29.4	58
	2	37.2	41	18.6	37
	3	--	--	--	--
	4 or more	23.8	26	2.8	5
Total		90.4	100	50.8	100
All areas	1	377.0	37	377.0	62
	2	354.8	35	177.4	29
	3	82.2	8	27.4	5
	4 or more	194.6	19	25.2	4
Total		1,008.6	100	607.0	100

This hypothesis was borne out by the data in that visits and days of use generated were heavily concentrated in the one-day class. Conversely, the White Mountains were hypothesized to be an area used by recreators during long weekends or vacations. The data bear out that for this area the visits are predominantly two days in length. However, of greater significance was the finding that the largest number of visit days was generated by visits of four or more days duration. At the other three area sets, two-day visits predominated and generated the largest number of visit days as well. These relationships seem plausible when one considers that the resistances to or "costs" of visitation tend to increase as distance from Tucson increases. Thus, one might expect to find frequent short visits to local areas and infrequent longer visits to more distant areas. Future research will need to use great care in determining not only type of use but the quantity of product consumed (produced) at a recreational area. If the sample number of visits, rather than visit days, is used for this purpose comparison between areas could be misleading. Number of visits may relate to one set of distance and use relationships, while number of visit days as a result of length of stay relative to visits may reveal quite a different kind of distance and use, hence, demand.

In order to follow this line of reasoning further, the length and frequency of visits at the area sets were put in redefined classes. Length of visit behavior of each household was classified in four categories. These categories were: (1) one-day visits, (2) overnight or short-stay visits (two to three days), (3) extended period visits (four or more days), and (4) indeterminate short-stay visits (households

that stay at some areas at some times for one day and others for two to three days). Frequency of visits behavior was classified into three groups. These were (1) infrequent recreators (1 to 2.8 visits during the year), (2) frequent recreators (4.2 to 7.0 visits during the year), and (3) very frequent recreators (eight or more visits during the year). The aim of these reclassifications was to attempt to place households into classes which more simply described their degree and intensity of involvement in recreation relative to manifested behavior. In turn, these characteristics were related to area sets for purposes of ascertaining the nature and volume of the product being produced at each set. As conceptualized, to describe consumption of the product by household is, in part, to describe production since the two occur simultaneously.

Table 26 indicates the distribution of households among length of visit categories as defined above. In all but one of the area sets, the White Mountains, most households visiting in and among the sets were characterized as day visitors. Approximately 81 percent of the households visiting the local lakes area set were in that category. In the White Mountains, on the other hand, a majority of the visitors were in the short stay or overnight group, but this set also contained a larger number and percent of extended stay households than any of the other area sets. When the frequency distribution of the length of stay characteristics of households at the five area sets were subjected to a statistical chi-square test of independence, the results indicated that those visiting the various sets were independent of one another in terms of the length of stay at the sets. Thus, it appears that the posited area sets may be differentiated in terms of the length of stay exhibited by households at the several areas.

Table 26. Households by Length of Visit Characteristics at the Area Sets.[a]

Area Set	Length of Visit Category: Day Visit — Number of Households	Day Visit — Percent of Total Visiting the Set	Short Stay Visit — Number of Households	Short Stay Visit — Percent of Total Visiting the Set	Extended Stay Visits — Number of Households	Extended Stay Visits — Percent of Total Visiting the Set	Indeterminate Short Visit — Number of Households	Indeterminate Short Visit — Percent of Total Visiting the Set	Number of Total Households Visiting Each Set	Percent of Total Households Visiting Each Set
Local lakes	60	81	10	13	2	3	2	3	74	34
Middle distance lakes	14	54	11	42	1	4	--	--	26	12
Salt River lakes	18	49	17	46	--	--	2	5	37	17
White Mountains	9	16	35	63	12	21	--	--	56	26
Distant lakes	17	71	6	27	1	4	--	--	24	11
Total	118	54	79	36	16	7	4	2	217	100

a. These frequency distributions, when subjected to a chi-square test of independence, were significant at the five percent level (χ^2 calculated = 75.36; $\chi^2_{(12_{df})\ (.05)} = 21.03$).

Table 27 represents the frequency with which the households visited the area sets or the degree of intensity in recreational participation manifested at the different areas. For all areas, a majority of the visiting households were infrequent recreators in that most households visiting each set normally did so 1.4 to 4.2 times during the year. The frequency with which households visited areas as the distance from Tucson increases tends to decline, which is what was hypothesized. The increasing travel costs and expenditures from a discretionary leisure time budget represent an increase in the real cost of the recreational product. Therefore, the frequency with which these products were purchased during the year declined with distance. The Salt River lakes were a slight exception in that there was some tendency for a larger percentage of households in this set to be characterized as frequent and very frequent recreators when classified by the number of visits made to that area during the year. This seems to imply that the demand preferences of those households visiting that area tend to be stronger than they are for households visiting the other areas.

These data concerning the frequency of recreational participation were subjected to a chi-square test of significance and were found to be not significant. From this one would conclude that the frequency of visit characteristics as between areas did not differ substantially from what could have been expected by chance--provided the sample size was sufficiently large to fill the cell requirements of the chi-square test. Since the last requirement was not met, no definite conclusions can be drawn.

Table 27. Households by Frequency of Visit Characteristics at the Area Sets.[a]

Area Set	Number of Infrequent Recreating Households	Percent of Total Visiting the Set	Number of Frequent Recreating Households	Percent of Total Visiting the Set	Number of Very Frequent Recreating Households	Percent of Total Visiting the Set	Number of Total Households Visiting Each Set	Percent of Total Households Visiting Each Set
Local lakes	60	81	6	8	8	11	74	34
Middle distance lakes	22	85	1	4	3	11	26	12
Salt River lakes	25	68	6	16	6	16	37	17
White Mountains	51	91	2	4	3	5	56	26
Distant lakes	22	92	1	4	1	4	24	11
Total	180	83	16	7	21	10	217	100

a. The frequency distribution of the households in this table were not significant when subjected to a chi-square test (χ^2 calculated = 11.21; $\chi^2_{(.05)}$ = 15.51 with eight Degrees of Freedom.

Summarizing the relationship between length and frequency of visits at the several areas, the local lakes, the middle distance lakes, and the distant lakes experienced a demand for their respective recreational products that tended to be relatively infrequent and for short stay visits. The Salt River lakes and the White Mountains were exceptions to this characterization. The Salt River lakes, with emphasis on demand for the water-skiing activity, experienced a very frequent use by the households that visited them. This finding suggests further research as to the nature of the demand for this activity, as well as the characteristics of the households which manifest it. The White Mountains, on the other hand, were infrequently visited by most households, but the lengths of stay were generally longer than at the other areas. This characteristic is probably associated with the distance factor and the wide diversity of recreational experiences available there. The question might then be asked as to the correlation between length of stay and the variables of distance and kind and range of recreational experiences available at an area location. This question was not investigated in this study.

Time of Visit

The survey question concerning time of visit was asked in terms of when the family normally visited a site or set of sites. They were asked to indicate whether they usually visited a site on weekdays, weekends, or for a vacation of longer duration. It was hypothesized that this characteristic is an important aspect of recreational demand in general and that it differs between different areas. It was further hypothesized that areas close to Tucson would tend to be visited on

weekdays or weekends, while areas more distant from Tucson would tend to be visited on weekends and vacations. It was thought this characteristic would be further defining of the sets of areas relative to demand for their products on the part of Tucson households.

The bottom line of Table 28 shows the number and percent of all visits to all sets relative to the time of week categories. The preponderance of visits, approximately 88 percent, were made on weekends, clearly indicating that non-urban outdoor recreation is a weekend activity. The distribution of visits between weekday and vacation categories was approximately equal as a percent of all visits.

Distributing the time of visit data over the five area sets does not support the hypothesis that area sets closer to Tucson experience a higher proportion of visits on weekdays. In fact, weekday visits at the local lakes was a smaller percent of all weekday visits than at any other area. The distant lakes, which were visited primarily for sight-seeing purposes, had the highest percentage among all areas of visits that occurred on weekdays and during vacations. This is probably accounted for by the transient nature of most of the visits to that area. That is, households tended to visit these lakes, either going to or coming from another area which was the major motivation for the trip. The White Mountains, which are relatively far from Tucson, also had a comparatively high percentage of visits which occurred on occasions other than the weekend. The Salt River lakes, however, experience the highest proportion among all areas of household visits on weekdays. This occurrence is perhaps related to the nature of the activity demand and is further grounds for more explicit research on the demand for the recreational product at this area set.

Table 28. Time of Visit at the Area Sets.[a]

Area Sets	Weekdays Only		Weekends Only		Vacation		Total Visits
	Number of Visits	Percent of Total	Number of Visits	Percent of Total	Number of Visits	Percent of Total	
Local lakes	9.8	4	227.2	91	13.4	5	250.4
Middle distance lakes	4.2	6	61.2	94	--	--	65.4
Salt River lakes	13.4	10	120.2	89	1.4	1	135.0
White Mountains	11.2	11	87.2	82	7.0	7	105.4
Distant lakes	7.0	13	38.2	76	5.6	11	50.8
Total	45.6	7	534.0	88	27.4	5	607.0

a. The frequency distribution of visits in terms of time categories in this table, when subject to a chi-square test, was significant at the five percent level (χ^2 calculated = 59.23; $\chi^2_{(.05)}$ = 15.51 with eight Degrees of Freedom).

When the distribution of time of visits across the area sets was subjected to a chi-square test, it was found to be significant at the five percent level. This implies that the area sets differ according to time of visit beyond what would be expected by chance.

Weekday only visits are apparently an increasing proportion of all visits as distance from Tucson increases. This is contrary to the beginning hypothesis. A plausible hypothesis at this juncture to account for this finding is that weekday participation in non-urban outdoor recreation is related to vacations centered on areas and purposes other than the five areas studied herein or is related to income, employment, and family composition that endows some households with a degree of foot-looseness that permits within the week recreation. Further analysis of the nature of recreational demand relative to time of visit characteristics is indicated.

Income

Data as to annual incomes of households surveyed were obtained in terms of five ranges of incomes--less than $3,000, $3,000 to $5,999, $6,000 to $9,999, $10,000 to $14,999, and $15,000 and over. Table 29 reports the distribution over these income classes of all households surveyed, all nonrecreating households, all urban or nonwater-based outdoor recreating households, and all non-urban, water-based recreating households. Of the 204 total households. 116 or 57 percent participated to some degree during the year in recreation at the non-urban, water-based sites included in the analysis reported in this chapter. However, Table 29 reveals:

Table 29. All Households Classified by Participation in Water-Based Recreation and Annual Income.[a]

Annual Income	Households	Nonrecreating Households	Recreating Households	
			Only Urban or Not Water-Based	Water-Based
		A. By Numbers of Households		
Less than $3,000	48	15	24	9
$3,000-$5,999	41	1	8	32
$6,000-$9,999	62	1	19	42
$10,000-$14,999	32	0	13	19
$15,000 and over	21	0	7	14
Total number	204	17	71	116
Percent	100	8	35	57
		B. By Percent of Households		
Less than $3,000	24	88	34	8
$3,000-$5,999	20	6	11	28
$6,000-$9,999	30	6	27	36
$10,000-$14,999	16	0	18	16
$15,000 and over	10	0	10	12
Total	100	100	100	100

a. This distribution was not subjected to a chi-square test because of the small number of nonrecreators in the sample. This would lead to cells with no observations as well as some with less than five, thus invalidating the test.

1. a marked tendency for households receiving less than $3,000 not to participate in outdoor recreation of any kind, especially to avoid non-urban, water-based recreation;
2. a slight tendency for households receiving from $3,000 to $10,000 to participate somewhat more than proportionately in non-urban, water-based recreation;
3. households receiving over $10,000 to participate in both classes of outdoor recreation about in proportion to their numbers in the total population.

It appears obvious that a low level of income or factors related thereto are distinct deterrents to participation in non-urban, water-based recreation, as defined for purposes of this study. Incomes above the lowest level seem to have little, if any, relation to such participation.

Table 30 shows for each of the five areas the distribution by income class of households visiting that area and the income class distribution of households that visit any area at least once. This permits two comparisons: (1) an "area involvement index" by income class and (2) the income class distribution of households visiting each area, compared to that for households visiting any area.

The first comparison reveals that area involvement tends to increase with income level, from 1.3 for incomes less than $3,000 to 2.3 for incomes from $10,000 to $15,000. This seems to indicate a wider range of choice available to households of higher incomes.

The second comparison reveals an apparent tendency for (1) the middle distance lakes to be underrepresented in the lower income classes and overrepresented in the middle and higher income groups; (2) for

Table 30. Households Visiting Either of the Five Areas at Least Once Distributed by Area and by Income; and Households Visiting Any Area Distributed by Income.[a]

Area Set	Annual Income: Number of Households — Less Than $3,000	$3,000-$5,999	$6,000-$9,999	$10,000-$14,999	$15,000 and Over	Annual Income: Percent of Households Visiting Indicated Area — Less Than $3,000	$3,000-$5,999	$6,000-$9,999	$10,000-$14,999	$15,000 and Over	Total Number of Households
Local lakes	3	22	30	10	9	4	30	41	13	12	74
Middle distance lakes	1	2	12	6	5	4	8	46	23	19	26
Salt River lakes	3	9	10	11	4	8	24	27	30	11	37
White Mountains	3	16	19	12	6	5	29	34	21	11	56
Distant lakes	2	4	11	4	3	8	16	48	16	12	24
Total (All Sets)	12	53	82	43	27	6	24	38	20	12	217
Water recreating households	9	32	42	19	14	8	28	36	16	12	116
Area involvement index	1.3	1.7	2.0	2.3	1.9	--	--	--	--	--	1.9

a. The frequency distributions in this table were not significant when subjected to a chi-square test (χ^2 calculated = 13.22; $\chi^2_{(.05)}$ = 24.99 with 16 Degrees of Freedom.

the Salt River lakes to be underrepresented in the lower middle income classes and overrepresented in the higher middle income group; and (3) for the distant lakes to be underrepresented in the lower middle and overrepresented in the middle income classes. Admittedly, the chi-square tests of significance have not been applied to these comparisons so one cannot assert the statistical significance of these relations. All that can be said is that they suggest the plausible hypotheses that the middle distance lakes, the Salt River lakes, and the distant lakes tend to be visited disproportionately by households of middle and larger incomes and that the other areas tend to be used about proportionately by households of all income levels.

Household Size

Table 31 indicates the household size distribution of all households in the survey and how these household sizes are distributed according to their participation in outdoor recreation. Though a sizable proportion of households composed of one or two persons do participate in non-urban, water-based recreation, households of this size are heavily overrepresented among the nonrecreating households and overrepresented, though to a lesser degree, among participants in urban or nonwater-based recreation. Households of middle size (three to five persons) exhibit a contrary pattern, being somewhat overrepresented among non-urban, water-based recreating households and underrepresented in the other recreating and nonrecreating groups.

When the households of the various sizes were distributed over the five area sets, no significant differences among the areas appeared relative to household size involvement; that is, the distribution of

Table 31. All Households Classified by Participation in Water-Based Recreation and Household Size.[a]

Household Size (Persons)	All Households	Nonrecreating Households	Recreating Households	
			Only Urban or Not Water-Based	Water-Based
		A. By Numbers of Households		
2 or less	90	14	38	38
3 to 5	80	2	20	50
6 or more	34	1	13	20
Total	204	17	71	116
		B. By Percent of Households		
2 or less	44	82	54	33
3 to 5	39	12	28	50
6 or more	17	6	18	17
Total	100	100	100	100

a. This distribution was not subjected to a chi-square test due to the fact that sample size would not permit fulfillment of statistical requirements.

household sizes for each area were about in line with the distribution found for water-based recreating households as a whole. However, among the sets, households visiting the White Mountains contained the largest percent of households containing two or less persons, and the households visiting the middle distance lakes contained the highest percentage of households consisting of six or more persons. However, little can be deduced from this relationship between household size and demand for the latter area because in many instances only one or two individuals from the household were the participants in the area's recreation.

Workweek of the Household Head

The approach adopted in analyzing the workweek of the household head in relation to non-urban, water-based recreation was to ascertain the length of the workweek in five categories--(1) retired or unemployed, (2) five days a week with days off together, (3) five days a week with days off separated, (4) six days a week, and (5) seven days a week. In this manner an aspect of the leisure time budget was incorporated into the categories.

Table 32 indicates the sample results in terms of workweek of heads of all households, nonrecreating households, urban or nonwater-based recreating households, and non-urban, water-based recreating households. Fifty-one percent of all households in the sample were in one of the two five-day workweek groups; whereas, among the water-based recreating households, 65 percent were in these groups. Thus, the overrepresentation of five-day workweek households among water-based recreating households suggests that this workweek characteristic is associated in a positive manner with this type of recreation. The

Table 32. Households Classified by Participation in Outdoor Recreation and by Workweek Characteristics.[a]

Workweek Days	All Households	Nonrecreating Households	Recreating Households	
			Only Urban or Not Water-Based	Non-Urban Water-Based
		A. By Numbers of Households		
0	57	16	19	22
5 with days off together	87	0	20	67
5 with days off separate	17	0	9	8
6	34	1	20	13
7	9	0	3	6
Total	204	17	71	116
		B. By Percent of Households		
0	28	94	27	19
5 with days off together	43	0	28	58
5 with days off separate	8	0	13	7
6	17	6	28	11
7	4	0	4	5
Total	100	100	100	100

a. This distribution was not subjected to a chi-square test due to the fact that sample size would not permit fulfillment of statistical requirements.

findings reported earlier in this chapter that water-based recreators were primarily weekend, short-period visitors is reinforced by the observation that 58 percent of the water-based recreating households were in the group having a five-day workweek with two days off together, which is conducive to this type of visit.

When the distribution of households relative to workweek and area set visited was subjected to a chi-square test, the frequency distributions were not significant. The amount of leisure time as measured in terms of workweek of the household head thus appears to be associated with the incidence of water-based recreation as a whole, but not necessarily with visitation to particular area sets.

Age of the Household Head

In analyzing the age of the household head relative to a household's participation in non-urban, water-based outdoor recreation, the households were grouped by nine-year ranges with the lower age group defined as households headed by a person aged 20 years or less and the upper age group defined as those headed by a person aged 61 years or over. This procedure was followed to facilitate the area subset analysis which follows.

Table 33 shows the distribution of households in terms of age of the head as this is related to all households and to participation in outdoor recreation. These data seem to warrant the hypothesis that participation in non-urban, water-based recreation tends to be inversely related to age of the household head.

Table 34 shows the distribution by age of head of households visiting each of the five area sets. Although the distributions in the

Table 33. Households Classified by Participation in Outdoor Recreation and by Age of Household Head.[a]

Age of Head	All Households	Nonrecreating Households	Recreating Households: Only Urban or Not Water-Based	Recreating Households: Non-Urban Water-Based
		A. By Numbers of Households		
20 or under	1	0	0	1
21 to 30	31	0	9	22
31 to 40	36	0	7	29
41 to 50	44	2	14	28
51 to 60	41	2	20	19
61 and over	51	13	21	17
Total	204	17	71	116
		B. By Percent of Households		
20 or under	b	0	0	1
21 to 30	15	0	13	19
31 to 40	18	0	10	25
41 to 50	22	12	20	24
51 to 60	20	12	28	16
61 and over	25	76	29	15
Total	100	100	100	100

a. This distribution was not subjected to a chi-square test due to the fact that sample size would not permit fulfillment of statistical requirements.

b. Less than .5 of one percent.

Table 34. Households Visiting Each Area Classified by Age of the Household Head.[a]

Area Set	Number of Households							Percent of Households						
	20 or Less	21-30	31-40	41-50	51-60	61 or More	All Ages	20 or Less	21-30	31-40	41-50	51-60	61 or More	All Ages
Local lakes	1	10	22	20	12	9	74	33	25	39	34	37	33	34
Middle distance lakes	0	5	7	9	3	2	26	0	12	13	16	9	7	12
Salt River lakes	1	11	7	10	3	5	37	33	28	13	17	9	19	17
White Mountains	1	10	16	10	11	8	56	33	25	28	17	33	30	26
Distant lakes	0	4	4	9	4	3	24	0	10	7	16	12	11	11
Total	3	40	56	58	33	27	27	100	100	100	100	100	100	100

a. This table was not statistically significant when subjected to a chi-square test.

table are not statistically significant, there are several plausible hypotheses one may draw: (1) there is no relation between the age of household head and household visits to the local lakes, the White Mountains, and the distant lakes; (2) younger age households tend to use the Salt River lakes more than proportionately to their numbers in the Tucson population, reflecting the interest in water-skiing at this area; and (3) the middle distance lakes are used disproportionately by middle-aged households and less by older aged families.

Other Factor Analysis

Three additional factors thought to characterize households that participate in non-urban, water-based recreation were analyzed. These factors are: (1) the ownership of recreational equipment, (2) the favorite household activity, and (3) the most important factor in area choice.

Seventy-one percent of all recreators in the survey owned recreational equipment. Since 84 percent of all the water-based recreators owned appropriate recreational equipment, it appears that water-based recreators tend more than other households surveyed to own equipment; one may also deduce that non-urban, water-based recreation tends to require equipment ownership by its participants.

When the ownership of recreational equipment was analyzed relative to individual area sets, no meaningful relationships were found.

In order to obtain some notion of the base for household decisions in non-urban, water-based recreation at each or any of the five areas, the households were asked to select from among six stated reasons the one most important reason why the selected area was chosen. The six

choices given them were: (1) convenience, (2) aesthetics, (3) available facilities, (4) cost, (5) travel time, and (6) roads. In tabulating the results of the survey, it was found that most, or 24 percent, of the households indicated facilities to be the most important factor. When this same analysis was applied area set by area set, no discernible relationship was found between visits to particular areas and the most important factor influencing such visitation choices. For each area, most households selected facilities as the most important factor in their choice of that area.

Water-based recreating households were diverse in their selection of the household's favorite recreational activity. Table 35, which shows the distribution of household selections, indicates that most of the households that participated in water-based recreational activities selected some activity other than a water-using one as the household's favorite activity. In this characteristic, water-based recreators do not differ much from the total sample; consequently, no generalizations can be drawn.

Analysis of households relative to their visits among the five area sets and their indication of their favorite recreational activity, most of the households visiting the local lakes and the distant lakes selected activities other than water-oriented ones--such as golfing, attending sports events, etc.--as their favorite activity. The close proximity of the former set to the urban community and the almost incidental nature with which households visited the latter set probably accounts for the preference selection of these households. The households visiting the middle distance lakes most frequently selected

Table 35. Favorite Recreational Activity of Non-Urban, Water-Based Recreators.[a]

Activity	Number of Households	Percent of Total Sample	Percent of Total Number of Water-Based Recreators
1. No choice	31	15	5
2. Swimming, boating, water-skiing	41	20	19
3. Fishing, boating	16	8	10
4. Camping, nature walks, or hiking	29	14	22
5. Picnicking	32	16	16
6. Sight-seeing	6	3	2
7. Other	49	24	26
Total	204	100	100

a. This distribution was not significant when subjected to a chi-square test (χ^2 calculated = 10.40; $\chi^2_{(.05)}$ = 1,259 with six Degrees of Freedom).

fishing as their favorite activity. At the Salt River lakes, more of the households had a preference for swimming, boating, and/or water-skiing. It seems that at these two sets the households were tending to participate in activities which they enjoyed the most. The households visiting the White Mountains were relatively diverse in their selection of favorite activities. They most frequently selected camping, while activities other than water-oriented ones were the second most prevalent selection.

One might deduce that a large proportion of the households visiting the local lakes and the distant lakes regarded the products of these area sets as secondary forms of recreation; hence, "inferior goods" in an economic sense. An "inferior good" is a commodity the demand for which does not shift directly with changes in income (Carter and Snavely, 1961). This characterization of the recreational product available at the local lakes seems particularly apt. As household incomes increase, the tendency will likely be for them not to consume more of the products of this area, but rather to purchase "experiences" at other areas such as the White Mountains or more of the recreational activities which are their expressed favorites.

CHAPTER V

HOUSEHOLDS AND THEIR RELATION TO AREA SETS

Having looked at the general characteristics of the five area sets as they relate to households which visit them, it is the aim of this chapter to look at the households which visit specific area sets (or combinations thereof). The purpose of this approach is to determine (1) behavioral patterns of water-based recreators relative to their preferences among areas and area combinations, (2) the factors which relate to these patterns, (3) the differences, if any, between household characteristics at particular areas (or combinations of areas), and (4) the characteristics of water-based recreating households as a whole.

The five areas which involve some 20 different sites could have involved 31 possible visitation patterns. Determination of which patterns were, in fact, manifested by water-based recreators in the sample was accomplished by recoding the initial data of the survey in terms of the five area set definitions presented in the previous chapter. In the analysis reported in this chapter, however, each household was identified with the actual area or combinations of areas it visited. Those households that visited one and only one area were analyzed as a distinct group of households from those that may have visited the same area but did so in combination with one or more other areas. In handling the data in this fashion, it was determined that of the 31 possible visitation patterns, 29 actually occurred in the survey.

Because many of the areas and area combinations had few household observations in them, difficulties arose relative to the analysis to which they could be subjected. To resolve this problem, the five area sets were combined further into groups believed to be meaningful to the objectives of this study. Table 36 shows the five area sets and area combinations which were analyzed, the sites contained therein, and the number of households included in each visitation pattern. These areas and area combinations will be referred to hereafter by their area set code numbers.

Activity participation and socioeconomic characteristics of households exhibiting these visitation patterns were subjected to a chi-square statistical test of independence. In order to accomplish this test, agricultural experiment statisticians developed a program in which the data developed in the survey could be analyzed. This program is on file at the Department of Agricultural Economics.

Basic to the test involved in this portion of the analysis is the null hypothesis that there is no significant difference between households with different visitation patterns relative to socioeconomic and activity characteristics. The proportions within the various factor classes, in terms of visitation patterns, are assumed to be "merely chance variations that are to be expected from the same population" (Siegel, 1956, p. 174). When these proportions are found to be significant, the null hypothesis is rejected and the visitation pattern is believed to be definable in terms of those characteristics.

One requirement of this test is that the expected frequencies in each cell of a matrix should not be too small. Statisticians have

Table 36. Household Visitation Patterns.

Degree of Involvement	Household Visitation Patterns	Area Set Code Number	Make-Up of Each Area Set	Number of Households	Percent of Total Water-Based Recreators
Single area visits only	Local lakes only	1	Parker Canyon Lake Pena Blanca Lake Rose Canyon Lake Ruby Lake Rucker Lake Riggs Lake	24	21
	Middle distance lakes only	2	Roosevelt Lake San Carlos Lake	1	1
	Salt River lakes only	3	Apache Lake Canyon Lake Painted Rock Reservoir Barlett Reservoir Horseshoe Lake Saguaro Lake	11	9
	White Mountains only	4	White Mountains lakes and streams	12	10
	Distant lakes only	5	Lake Mary Lake Havasu Lake Mohave Lake Mead Lake Powell	3	3
	All area pairs which include area 4	6[a]	White Mountains and any one of the other areas	25	22

Table 36. (Continued).

Degree of Involvement	Household Visitation Patterns	Area Set Code Number	Make-Up of Each Area Set	Number of Households	Percent of Total Water-Based Recreators
Area pair visits	All area pairs which do not include area 4	7	Any pair of areas which does not include the White Mountains	11	9
Multiple area visits	All other Combinations of areas	8	Any multiple of areas greater than pairs	29	25
Total				116	100
	Pair set - area 1 and area 4 only[a]	6A[a]	Local lakes and White Mountains only	17	15

a. Set 6A, composed of Area 1 and Area 4 in combination, was analyzed separately from pairs with Area 4 (Set 6). This pair (Set 6A) comprises 68 percent of all households included in Set 6.

recommended that for χ^2 tests with degrees of freedom larger than one that fewer than 20 percent of the cells should have an expected frequency of less than five, and no cell should have an expected frequency of less than one. In many cases, adoption of this criteria would render the statistical findings of this research invalid.

Initially, 15 socioeconomic and activity factors were posited as being related to area visitation patterns. These factors were: (1) activity orientation, (2) income of the household head, (3) household size, (4) age of the household head, (5) number of children in the household, (6) length of stay of the visit, (7) time of visit, (8) frequency of visit, (9) average workweek of household head, (10) education of the household head, (11) the most important factor in area choice, (12) the household's favorite activity, (13) the most important factor influencing activity participation, (14) identity of the usual participants at an area, and (15) the ownership of recreational equipment. As a result of the program capacity, as well as the statistical requirements to which these factors in terms of visitation patterns were to be subjected, several alterations were necessary. We dropped two factors from further analyses--(1) the most important factor influencing activity participation and (2) the identity of the usual participants at an area.

The first computer run, which involved the largest number of observed frequencies within cells, indicated that future runs involving these two factors would be statistically meaningless due to insufficient observations in cells. With the elimination of these two factors there were 13 of the 15 which were utilized in this portion of the analysis.

Analysis of Household Visitation Patterns

In determining (1) the differences, if any, in the socioeconomic characteristics of households visiting different areas and area combinations, and (2) whether the characteristics of households visiting particular area sets differed appreciably from the gross socioeconomic characteristics found in the previous chapter, 12 different approaches or computer runs were conducted each involving comparison of different areas or area combinations. Because of the limited basis for *a priori* judgments as to what visitation patterns, if any, were meaningful and, subsequently, what socioeconomic factors would be found to be related to them, 12 computer runs testing a wide array of possible visitation patterns were necessary to determine the validity of the preconceived notion that areas can be differentiated by the nature of the recreation product available at each as revealed; on the supply side, by the activities engaged in at each and, on the demand side, by the socioeconomic attributes of the household visiting at each.

For each of the 12 computer runs testing on classification of areas, there were 13 contingency tables, one for each socioeconomic and activity factor or, in all, 156 comparison tables. These tables are on file in the Department of Agricultural Economics. The rows in each of these tables represented the visitation pattern or area classification being tested and the columns were the attributes of the socioeconomic or activity factor under consideration. The resulting chi-square value indicated whether or not the area classifications involved differed significantly with respect to the frequency distributions of that factor.

Because a majority of the computer runs appeared to lack explanatory power or had too few observations to have any statistical significance, only five runs were analyzed. These were the ones which involved all of the area classifications in their most aggregate sense or that were the most significant patterns of visitation as measured by the number of households. The 65 matrices of these five runs are presented as Appendix 5. What follows, then, are the findings from employing this methodological approach.

Single Area Visits Compared to Visits to Any Pair of Areas and to Multiple of Areas

We begin with a comparison between all of the households that went to one area only, to some pair of areas, and to some larger multiple of areas. This comparison was undertaken because it would provide descriptive data of all water-based recreating households in terms of the 13 factors of interest relative to visitation patterns manifested.

In total, there were 116 households in this comparison. Forty-four percent of the households went to one area only, 31 percent went only to pairs of areas, and 25 percent went to combinations of three or more areas. The factors in the comparison which were found to be significant by the chi-square test were (1) type of activity participated in by households, (2) the frequency of visits to the areas by households, and (3) the length of visits. This implies that the households visiting in the three respective area patterns tended to differ not so much in terms of socioeconomic characteristics as in the nature of their visitation characteristics.

Households which visited one and only one area engaged in a wide range of activities with the largest proportion, 24 percent,

engaging in sight-seeing. Of the households which visited a pair of areas, 22 percent participated in sight-seeing and picnicking as the largest proportionate distribution among activities. Households which visited a combination of areas appeared most frequently to combine swimming, boating, or water-skiing with fishing and boating. These findings suggest that increase in intensity of area involvement as revealed by area visitation may be directly related to the range of water-oriented activities participated in by households. That is to say, people that go to one area only may be enjoying the water incidental to a nonwater-use activity; but, as water activity orientation increases, the visitation pattern increases accordingly. Underlying this may be a strong preference for a particular activity, such as fishing or water-skiing, which tends to motivate the consumer to a number of areas and subsequently into supplementary activities such as picnicking.

Frequency of visit characteristics were determined by the same procedure outlined in Chapter IV. Accordingly, the definitions of that chapter are applicable here. (See Chapter IV, page 78.)

Analysis of the frequency of visit characteristics relative to area visitation patterns indicated that both single area and pair area visiting households were principally infrequent visitors (1.0 to 3.0 visits per year). Of those households visiting a multiple of areas, however, 52 percent were characterized as being frequent visitors (4.0 to 7.0 visits per year). This is not astounding, however, since these households must have visited at least three areas to be in the multiple visit groups. The important point is that the multiple area visiting households necessarily are inclined to be more frequent recreators.

Households which visited one and only one of the five areas comprised 48 percent of all of the infrequent visiting households, while the multiple area visiting household comprised only 18 percent of the category. (Households that visited pairs of areas accounted for 34 percent of all infrequent visiting households). On the other hand, of households visiting a combination of areas, 90 percent are characterized as being frequent or very frequent visitors. Thus, generally as the number of areas visited increases so does the frequency of participation. This implies that the multiple area visiting households tend to be more avid recreators than the other groups.

Analysis of length of stay per visit is based on the most frequently observed length of stay manifested by households. The gross results involving all water-based recreators indicated that 55 percent of the households were day visitors. On the other hand, 71 percent of the households which visited one and only one of the areas were day visitors. This indicated that these households were not only infrequent visitors but short period visitors as well. Of particular interest is the observation that the pair area visitors contained the largest proportion of the households which stayed for three days or more while the multiple area visiting group contained no households in this category. This finding is primarily accounted for by pair area visiting households which visit some area in combination with the White Mountains, an important vacation area, where visitors tend to stay for a longer period of time. It may be significant that no multiple area visitors are long stay visitors, thus indicating a preference for frequent relatively short visits and, if they take the common longer vacation, not to take

it at an Arizona water-based recreation area. Though not a factor that exhibited statistical significance in this analysis, it is a plausible hypothesis that income would tend to be higher among households visiting increasing numbers of areas. This hypothesis is given plausibility by the income distribution findings. Although most of the households visiting one and only one area and most of those visiting multiple areas are found in the middle income ranges, the distributions tend to "tail" in opposite directions. Eighty percent of the households visiting single areas are found in the $9,999 and less average annual income group and 97 percent of the multiple area visitors are found in the $6,000 and over average annual income class.

In terms of leisure time, the group of households visiting multiple areas when compared with other classes contains the largest proportion of households that have a five-day workweek with days off coming together.

Comparison of Single Area Visitations Involving Area 1 Only, Area 3 Only, and Area 4 Only

Having, in the previous chapter, examined the characteristics of non-urban, water-based recreating households as a class and, in the previous section, examined the characteristics of those households which went to one and only one area, the analysis now centers on three selected areas visited by many households on a one and only one area basis. This will provide some insight into differences between households that visited these single areas when compared to all single area visiting households and to all water-based recreating households.

The areas in this comparison include the local lakes, the Salt River lakes, and the White Mountains. As such, they tend to represent

each of the distance categories and three of the activity orientations which were used as a basis for combining sites into areas. Of the 47 households (41 percent of all water-based recreating households) that went to one of these areas only, 51 percent went to Area 1, 23 percent to Area 2, and 26 percent to Area 4. The findings of this analysis tended to substantiate some of the beginning hypotheses. Family size of households visiting these areas singly was inversely related to the distance that the area is from Tucson. That is, households of larger sizes tended to go to the local lakes while households with only one or two members comprised 75 percent of all the households that went to only Area 4--the White Mountains. This inverse relationship also held true for the age of the household head. Those who visited local lakes only apparently were households with relatively young heads who had one to three children, while the White Mountain visitors were older individuals without the responsibility of young children. Interestingly, the households which visited Area 4 only were all classified as infrequent visitors. This contrasts rather sharply with pair set visitors that include the White Mountains. In the pair visit pattern, including Area 4, there is a disproportionate number of frequent visitors. This seems to imply that those households which visit the White Mountains only are older couples that go there perhaps once during the year--they usually stay at least overnight and 33 percent of them are retired. On the other hand, pair area visitors to the White Mountains include many younger families with children that combine it for vacation purposes with other visits to another area.

Adding insight into the preferences of these households were their statements as to the most important factor influencing their area choices. A majority of those who visited local lakes only divided their responses evenly between convenience and facilities, while 56 percent of the households who visited only the Salt River lakes indicated facilities to be the principal factor in their choices. Since the Salt River lakes--Apache and Canyon Lakes--are used heavily for water-skiing, this appears to substantiate the hypothesis that the character of the product (services) produced at these areas is unique for this group of consumers. On the other hand, the households which visited the White Mountains only indicated travel time as the most important factor in area choice, probably accounting for the infrequent visit characteristics of this group.

In general, these comparisons tended to reinforce some of the intuitive notions of the researcher as to the nature of the significant differences in water-based recreation products as revealed in supply and demand differences related to them. The significance of the product differences as revealed by the characteristics and activities of water-based recreators remains a subjective judgment due to the increasing weakness of the statistical test involved brought about by the sub-classifying of the initial sample. However, the statistical test of this comparison did serve to indicate that the single area use of these areas is generally related to socioeconomic and activity characteristics in a manner which follows currently existing recreational economic theory. Statistical validation of these findings will require a different sample design. Only family size and frequency of visit were found to be statistically significant in the procedures followed here.

Comparison Between All Pairs Which Include Area 4 and All Pairs Which Do Not Include Area 4

Because the incidence of visiting the White Mountains was believed to be a complex behavioral characteristic of water-based recreating households, it was decided that a computer run involving households which visited this area set in combination with another should be compared to those households which visited a pair of areas not including the White Mountains. This might provide insight into this aspect of recreational demand. Fifty-six or 48 percent of the 116 water-based recreating households included the White Mountains in their mix of recreational experiences. Twenty-five households or 44 percent of the 56 who went to the White Mountains visited some one other area during the year. Thus, of the 36 households who were pair set visitors, 25 or 70 percent included the White Mountains as one area of the pair they visited. These 25 households, combined with 12 households that went only to the White Mountains, comprise 66 percent of the 56 that went to this area. The remaining 19 households that visited the White Mountains did so in combination with two or more other areas and are included in Area Set 7. Thus, of the 29 multiple area visitors, 66 percent included the White Mountains in their recreation mix. Furthermore, of the 56 households that visited the White Mountains during the year, 44 or 79 percent included one or more visits to one or more other areas during the year. Thus, it is quite apparent that the White Mountains are a major component in outdoor recreation demand by Tucsonans.

It was expected that the major difference between the households visiting the pairs of areas which included the White Mountains and those not including the White Mountains would be principally in activity

orientation and possibly in frequency of visits during the year. This difference, it was thought, would be the result of the wide range of activities available in the White Mountains and the relatively long distance to the mountains from Tucson which would tend to limit the frequency of visits. As it turned out, only the activity distribution was statistically different. In both area sets the frequency of visit category was emphatically infrequent. Eighty percent of both pair groups fell in this category, thus falling relatively close to the 75 percent of all water-based recreating households that were infrequent participants.

In general, this comparison failed to indicate socioeconomic characteristics which might explain the difference between the two household groups involved. The households which visited in combination with the White Mountains tended to be more widely distributed among all groups and factors but not to the extent of statistical significance. These findings seem to indicate that households visiting in pair combinations are basically the same in terms of socioeconomic characteristics regardless of the areas included in the pair, but differ in terms of the nature of their recreational preferences.

Interestingly, 68 percent of the households visiting an area in combination with the White Mountains and 72 percent of those households visiting a pair of areas not including the White Mountains did so with the local lakes being the other area involved. In total, 74 or 64 percent of all non-urban, water-based recreating households visited the local lakes at least once during the preceding year. Twenty-five of the 29 households visiting multiple areas did so in combination with the local lakes. This implies that the local lakes are indeed a

significant component of the recreational "packet" purchased by Tucson households during the year. Whether or not the recreational product purchased at the area that is combined with the local lakes is competitive, complementary, or supplementary in relation to the products consumed at the local lakes is definitely an area of interest for further research. It would seem likely that income and leisure time constraints faced by these households explain the manifested behavior, but the available data does not permit substantiation of this hypothesis. What is probably occurring is a supplementary demand relationship in which the households have a total recreation demand that embodies local lake purchases which are inexpensive in terms of overcoming the "cost" of accessibility and another area, such as the White Mountains, which is considerably more "costly" due to distance and leisure time factors. Just as the housewife has a demand for meats--some more costly than others--so does the recreation consumer have a demand for recreational products; hence, areas of different levels of "costliness." This rationale is applicable to analysis of these area pair relationships which involve the local lakes and some other area.

Interesting in this connection would be an analysis of these relationships to determine the effect of increasing household income on visitation to the local lakes. If visitation declines as income increases, the implication would be that the recreational product of the local lakes tends to be an "inferior" good.

Comparison Between All Area Pairs Which Include Set 4 and Multiple Area Patterns

Looking further at the rationale developed in the previous section, the analysis now looks at the significant pairs of areas in comparison with households which visited multiple combinations of areas. In effect, the recreational "market basket" is expanded further in this case.

It was hypothesized that there could be three possible explanations for the difference between the two groups involved in this comparison. First, the number of areas visited might be explainable in terms of the wide spectrum of household recreational activity demands. Second, the areas visited might be explainable in terms of an intense specific activity orientation. Or third, a combination of the first two might account for the widening number of area visitations.

The results of the computer analysis relative to activity participation, although not statistically significant, appear to support the third explanation for the number of area visitations. The households which visited a pair of areas which included the White Mountains engaged in a wide array of activities indicating a diversified activity demand by these recreators. The households visiting multiple areas, on the other hand, tend to become grouped around direct water-using activities and activity subsets involving direct water-using activities.

Socioeconomic characteristics of the households exhibiting these two visitation patterns are not appreciably different except that the households visiting the multiple areas tend to be found primarily in the upper range of the income and age of household head distributions.

Comparison of Single Area and Multiple Area Visitation Patterns

In order to further analyze the relationship of socioeconomic and activity factors with the number of area sets visited, a computer run comparing households that visited only one area with those visiting a multiple of areas was included. The results of the run indicated five socioeconomic and activity characteristics in which the household distributions as between the two area classes were statistically significant. These were: (1) income ($\chi^2_{cal} = 12.00$; $\chi^2_{(.05)} = 9.49$ with 4 Degrees Freedom), (2) number of children ($\chi^2_{cal} = 2.51$; $\chi^2_{(.05)} = 5.99$ with 2 Degrees of Freedom), (3) length of stay ($\chi^2_{cal} = 39.80$; $\chi^2_{(.05)} = 11.07$ with 5 Degrees Freedom), (4) time of visit ($\chi^2_{cal} = 15.20$; $\chi^2_{(.05)} = 7.81$ with 3 Degrees Freedom) and (5) activity participation ($\chi^2_{cal} = 40.37$; $\chi^2_{(.05)} = 18.31$ with 10 Degrees Freedom).

The income distribution of the two groups indicates a substantially larger proportion of multiple area visiting households in the upper income ranges as compared to households visiting single areas only. Eighty-two and six-tenths percent of the households visiting multiple areas and 49 percent of those visiting single areas only were in the $6,000 and above average annual income class. Undoubtedly, this finding is highly correlated with the educational levels described in the previous paragraph. This appears to imply that education and income levels do have a significant bearing on the character of recreation experiences which households demand. It would be interesting in future research to attempt to ascertain the influence that education has on preference patterns and

the change, if any, on these preferences when income levels permit latent preferences to manifest themselves.

Households which visited a multiple of areas during the year were found to have a larger number of children than those which visited only a single area. The "skewness" in the distributions were in the opposite directions which is to say that multiple area visiting households were predominately in the three to five and six or over children groups; whereas, households visiting single areas only were predominately in the two to three and one to two children groups. However, underlying this relation may be an inherent bias due to the manner in which the data were collected. If any member of a household visited an area, that household's socioeconomic characteristics were associated with that visit in this analysis. Therefore, the larger the household the greater the probability that the household would be classified as a recreating household and the greater the possibility that a variety of areas would be visited when the visits of all individual household members were aggregated.

The nature of the recreational visit was a characteristic in which the single area only visitors definitely differed from those visiting multiple areas. Households visiting only one area did so primarily on hourly, daily, or weekend visits. On the other hand, the households visiting multiple areas tended generally to visit for longer periods, and within their total "packet" of visits, they usually stayed for longer periods as the area distance from Tucson became greater. Associated with this tendency was a decrease in frequency of visit as the travel distance increased.

The workweek characteristics of the household heads were interesting in that 48 percent of the heads visiting single areas only were found in the group having a five-day workweek with two days off, while 69 percent of heads visiting multiple areas were found in the same category. Compared to the prevalence of this characteristic among water-based recreators in general, the findings reveal that the proportion of households that have this workweek and that visit single areas tend to be less than the 58 percent of all 116 water-based recreating households who have this workweek characteristic; whereas, the proportion of households visiting multiple areas that have this workweek exceeds this figure.

Although not conclusive, these findings appear to show up the obvious hypothesis that leisure time influences the extent to which households recreate. In this sense, it appears that the leisure time variable may be as important a demand "shifter" as is income in classic demand analysis for "normal" goods and services. Functional demand curves show a price/quantity relationship with other things such as income, technology, and preferences remaining unchanged. In the case of recreational goods or "experiences," it seems that leisure time is an important independent variable which requires explication similar to income if the derived demand function is to be meaningful.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The objectives and thesis of this research have been essentially exploration of demand as it pertains to rural, water-based outdoor recreation. The question has been asked--what is the demand by Tucson residents for outdoor recreation, specifically water-based outdoor recreation, and how can this demand be measured and its determinants revealed and assessed? In order to answer these questions, the problem was conceptualized in a framework which would permit inferences to be made. Though this conceptualization appears workable, it remains only a set of posited hypotheses relative to recreational demand as no effort was made herein to quantify explicitly the price and quantity variables that would be necessary in order to derive a demand function in the economic sense.

Within this conceptualization, several different approaches have been tried for utilizing the derived data for analytical purposes--no one of which was entirely successful. However, this research does permit some insight of a descriptive kind into the nature of Tucson household outdoor recreation demand. From this descriptive analysis, it may be possible to develop more specialized approaches that will lead to derived demand functions in the economic sense.

The basic approach adopted in this research has been to view the population as one of sets and subsets. That is to say, from among the permanent residents of Tucson there were two basic sets--nonrecreators

and recreators. Further, the recreator set included a subset of non-urban, water-based outdoor recreators and this subset itself was composed of further subsets of differing area and activity patterns.[10] By describing the socioeconomic characteristics and recreational activities of these non-urban, water-based recreator subsets and the area associated with their visits and activities, the outcome has been a description of the water-based outdoor recreation market in Tucson and of participants in that market. The power of the statistics used declines as the analysis proceeds from description of the total sample to subsets within the sample. However, it is felt that even with this underlying weakness the results do offer indications of tendencies within the Tucson recreation market. This is, in fact, the real objective of this research.

Outdoor Recreating Households in Tucson: Summary of the General Survey

The Kind and Quantity of the Outdoor Recreation Products Acquired

In summarizing the findings of the general survey, it was determined that outdoor recreation in its broad context has a diversified market and consumer base. With 92 percent of the households sampled indicating they went into the "recreational market" and made at least one "purchase" during the year, the implication is that a recreational

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10. Other subsets were non-urban, land-based recreators and urban facility outdoor recreators.

product of some sort is in demand by practically every household in Tucson.

But what of the nature of the product? In general, the survey revealed that the activities participated in by the greatest number of households, picnicking, sight-seeing, swimming, and driving for pleasure, were activities that: (1) lent themselves to family participation, (2) required few special skills or equipment, (3) were associated with accessible (hence, lower "cost") facilities, and (4) required only a small portion of the leisure time budget. In other words, just as with any other type of commodity, the economic forces of supply and demand are operative and the largest quantities of recreational experiences produced and consumed are those which are the least "cost" ones. As the "cost" increase relative to accessibility, whether in terms of travel time, available facilities, special equipment, etc., the quantity consumed declines and the consumer market becomes more constricted.

Of further significance are the quantities of the various recreational activities purchased by the recreational households. For most of the activities--two of the three most popular activities, including picnicking and sight-seeing--households normally enter the recreational market but one to three times during the year. This purchasing pattern seems to characterize all of the activities which tend to become more "costly" as measured by leisure time expenditure, specialization of skills, equipment requirements, and specific facility and/or resource needs.

More frequent purchases are made of such items as swimming, driving for pleasure, and attending outdoor sports events which are

usually readily accessible in terms of the above "costs." These demand patterns indicate quite clearly the uniqueness of the several recreation products in terms of site factors and the interrelationship to the costs involved in obtaining site access.

Not unlike the household purchases of "staple" and specialized food commodities, the content of the recreational activity "basket" is determined by the interplay of price and income (in both money and time), tastes and preferences, the price of substitute activities, and a number of socioeconomic characteristics. Worthy of note is the finding that though the quantity consumed of any one activity may be small (one to three times during the year) when the total of all outdoor recreational activities consumed by each Tucson household are aggregated relative to frequency of participation, the average household in Tucson may be described as a frequent (four to seven times during the year) consumer of outdoor recreational commodities (experiences).

Socioeconomic Characteristics of Outdoor Recreating Households

Age. Eighty percent of the recreating households were headed by individuals who were 60 or less years of age. Conversely, 76 percent of recreators in the sample were over 60 years of age.

Education. Although a majority of household heads in the sample completed 12 or less years of formal education, there was a marked difference between the distribution of recreators and nonrecreators contained therein. Only 17 percent of the heads of recreating households had completed eight or less years of school, while 29 percent of the nonrecreators were found in this educational range. Additionally, 43

percent of the recreator heads attended college while only 22 percent of the nonrecreators had done so. Those households with heads that had completed more than 12 years of education that indicated no one in the household recreated generally had an offsetting factor such as advanced age or illness that precluded recreational participation.

Occupation. Occupationally, 47 percent of the recreators were found in either professional, craftsmen, foremen, kindred workers and managers groups. On the other hand, 94 percent of the nonrecreators were unemployed (retired or without work). Again, this occupational characteristic was usually associated with advanced age or a physical disability of some sort. The occupation of the household head is significant relative to the character of the household's recreational activities because of two factors associated with occupation--income and leisure time.

Income. In terms of income, 71 percent of the recreating households had an average annual income of $3,000 and above, while 88 percent of the nonrecreators received less than $3,000 average annual income. This would imply a very strong, though not necessarily linear, relationship between family income and the incidence of recreation. It was anticipated that as income increased, recreational participation would increase. This was found to be generally true, but only when unconstrained by advanced age or by occupational responsibilities. Either one of these two constraints, which are often associated with higher income levels, can act to constrain recreational participation even though income levels may be high. Advanced age will hamper participation for physical reasons and occupational responsibilities will impinge on available leisure time.

Household Size. The incidence of a recreating household tended to be associated with at least two or more members in the household. Certainly, it can be said that nonrecreators are primarily found in households of only a single member. Furthermore, in nonrecreating households this single member is typified as being over 60 years of age, retired, and having an average annual gross income of less than $3,000. As the household increases in size, however, the probability that at least one member of the household will recreate increases. This is multivariant in its connotations as households with one to three children tend to represent young to middle-age families with above $3,000 average annual income. For such households, the propensity to participate in some type of recreational activity is high.

Workweek. Workweek characteristics of Tucson household heads reflected several interesting things. First, 55 percent of the recreating household heads worked only five days a week. Conversely, only 18 percent of nonrecreators are found in this class. Secondly, the majority of nonrecreators, 82 percent, are found in the retired or unemployed occupational group; hence, they work zero days per week. The available leisure time is obviously outweighed by limited incomes, physical disability, and/or advanced age.

Nonrespondents to the Recreation Survey

Rounding out the summary of the general survey, an attempt was made to identify the households which refused to respond to interviews. Due to the fact that this information by necessity was obtained by interviewers' observation, it is far from exact but useful for further

research. Socioeconomic characteristics were estimated on the basis of what the interviewer could ascertain, both before and after the respondent's refusal.

Ethnic background appeared to have considerable bearing on the incidence of nonresponse. From among the 21 cases of nonresponse in which the interviewers specified ethnic background, 52 percent were found to be Spanish-American, Negroid, or Indian. Approximately, 30 percent of the respondents were found in these ethnic groups.

Seventy-six percent of the nonrespondents were believed to be nonrecreators based on the interviewer's observation relative to socioeconomic characteristics. The mean age of the nonrespondents was believed to be 52 years of age; 77 percent of the households were believed to fall in the below $5,000 average annual gross income bracket; and the interviewers felt that approximately 66 percent of the nonrespondents were in the group having 12 or less years of formal education. When all of these factors are considered together and subsequently related to the survey findings, it seems safe to conclude that the nonrespondents reflect the socioeconomic characteristics of nonrecreators.

The principal reasons given by the nonrespondents for not wishing to be interviewed included, in order of frequency: (1) aged or disabled and did not recreate, (2) too busy and (3) they were ill and hence, did not recreate. These reasons further substantiate the belief that the bulk of nonrespondents were nonrecreators. Hence, the proportion of recreating households in the total population, as reported herein, is biased upward and the socioeconomic characteristics of nonrecreators, as reported herein, may also be biased, but indeterminately.

Non-Urban, Water-Based Recreation Purchases by Tucson Households: Summary

Non-urban, water-based outdoor recreation by Tucson households was the specific concern of this research. Consequently, the primary emphasis of data and analysis relates to this problem. Due to the unique nature of the production and consumption process in outdoor recreation, two analytical approaches have been followed.

In the first, attention centered on the rural, water-based recreation areas as a whole and on its component areas separately as the "market" and as "alternative markets" for such recreation "purchases" by Tucsonans. This approach is analogous to determination of the distribution among markets of the total purchases by consumers of specified classes of agricultural products. The objective of this phase of the study was to determine the total purchases by Tucsonans of rural, water-based outdoor recreation within the recreation area as a whole (the overall market) and as among the individual areas which constituted the several alternative "markets" and/or "commodities" into which the total market was divided.

In the second approach, the "basket" of rural, outdoor water-based recreation purchased by each individual household was the study focus. This approach centered on the behavior of the "consumer" of recreation (rather than on the market, as did the first) and is analogous to the analysis of meat purchases by individual consumers in terms of the composite of meat products purchased relative to factors of cost, preferences, income, and other socioeconomic parameters.

The Non-Urban, Water-Based Recreation Market: Summary

The Overall Area Market. Sample results indicated that 57 percent of households (116) entered the non-urban, water-based recreation market at least once during the year preceding the survey. This is a substantial portion of the sample and represents 62 percent of all recreators.

1. Recreation Services Acquired--As water-based recreators, activity participation in order of magnitude was (1) fishing, (2) picnicking, (3) swimming, boating and/or water-skiing, and (4) camping, nature walks and/or hiking. This represents a shift from the general survey where picnicking and swimming were the more popular activities.
2. Frequency of Acquisition--In acquiring recreation services in the rural, water-based area, the 116 water-based recreating households may be characterized as: (1) making on the average of five visits during the year to water-based areas, (2) they stay on the average of approximately 1.7 days per visit, and (3) typically, the visits were made on the weekend. Thus, rural, water-based recreators as a group participate more frequently and tend to stay for longer periods of time than do outdoor recreators in general.
3. Socioeconomic Characteristics of Participants--
   (a) Income--Sixty-four percent of the water-based recreating households has an average annual gross income in the $3,000 to $9,999 range, compared with 54 percent of all recreators

and 50 percent for all households in the sample. The income range containing the largest number of water-based outdoor recreating households was the $6,000 to $9,999 range wherein were found 36 percent of the 116 households. This compares with 32 percent for all recreating households and 31 percent of all households in the sample.

(b) Workweek--The workweek was taken to be a measure of the availability of leisure time of households. Water-based recreators were found to have proportionately more leisure time according to this measure than was the case with recreators in general. Fifty-six percent of the water-based recreating households worked five days a week with two consecutive days off, while only 46 percent of the general recreators fell in this group. Remembering that water-based recreation, as defined, required a considerable expenditure of travel and on-site time to participate in the experience, it is not surprising that the incidence of available time is more apparent among water-based recreators.

(c) Household size--Fifty percent of the non-urban, water-based recreating households contained from three to five members. This compares with 42 percent for all recreating households and 39 percent for the total population. As such, water-based recreating households tend not to be in the two or less size class. The most noticeable difference between general recreators and water-based recreators is the two previously mentioned household size groups. The water recreators

contained proportionately fewer in the two or less size and more in the three to five size household than was the case with general recreators.

(d) Age of household head--The age distribution of household heads for water-based recreating households was essentially the same as that for general recreators. Sixty-seven percent of the water-based household heads were found to be between the ages of 21 and 50 years. Associated with this age grouping and differing from the general recreators is the probability of a three to five household size or one or more children. The incidence of a household with children thus appears to increase the probability that a household will recreate and that it will do so at a water-based area.

Particular Rural, Water-Based Recreation Markets. Water-based recreation sites were grouped into area sets each of which, it was hypothesized, produced a relatively homogenous composite of recreational activities and each of which was composed of sites which were roughly of similar distance from Tucson. In this way, area visitation, hence, demand by particular "markets," could be analyzed in terms of socio-economic variables under the assumption that travel cost or "price" and recreation product were similar for all sites within each area set, but differed between sets for Tucson residents. Thus, each area set represented a different recreation product, the demand for which could be analyzed in terms of socioeconomic and preference variables of the households visiting them.

Five area sets representing different recreation products were delineated. They were (1) the local lakes, (2) the White Mountains, (3) the Salt River lakes, (4) the middle distance lakes, and (5) the distant lakes. Of the 116 households that acquired rural, water-based recreation products, more of them went to the local lakes than any other area. This area set was followed in descending order of popularity by the White Mountains, the Salt River lakes, the middle distance lakes, and the distant lakes. Each of these areas was most frequently used for the following activities:

Local lakes	Picnicking and fishing
White Mountains	A broad range of water-related activities
Salt River lakes	Swimming, boating and/or water-skiing
Middle distance lakes	Fishing and boating
Distant lakes	Sight-seeing

The distance of the area set from Tucson appeared to have a strong relationship to the total number of households from Tucson which visited it. A major exception was the White Mountains, where the broad range of activities and unique resource orientation seemed to have a high value to Tucson consumers. They were, therefore, more willing to pay the "cost" of obtaining the recreational experience offered there.

The socioeconomic characteristics of the recreation participants at each area set and the nature of the preferences exhibited by them as between the sets are summarized as follows:

1. Local lakes--The local lakes were visited by 63 percent of the water-based recreating households principally for the purpose of picnicking and/or fishing. Most of the households visited

there three times during the year, usually for a day visit and on the weekend. Thus, they were typically infrequent short stay visitors. A majority of the households visiting the local lakes received from $3,000 to $9,999 average annual income, worked five days a week with two consecutive days off, and had from three to five members. Of all the area sets, households visiting the local lakes tended to stay for the shortest period of time per visit.

2. Salt River lakes--The Salt River lakes were visited by 37 or 31 percent of the water-based recreating households principally for the purpose of swimming, boating, and water-skiing. The preponderance of water-skiers in this group influenced the visitation characteristic at this area to the extent that households visiting there did so more frequently than at any other of the area sets--3.65 times during the year. The average length of their visits were for a day and a half. As was the case for every other area set, the household that visited the Salt River lakes were nonetheless typically infrequent visitors who visited this area on the weekend.

Although the households which visited the Salt River lakes were typically in the $3,000 to $9,999 average annual income bracket, there were more households proportionately in the $10,000 to $14,999 income group than any other area set. This would indicate that activities offered at this area tended to draw households of somewhat higher incomes than did other area sets. The high incidence of water-skiers at this area set--recreators who

appear to have a strong preference for this activity--and the necessary high fixed cost to participate in it may account for the tendency of this area to attract households of higher income levels who can afford the sport and who have the financial ability to visit the area more frequently.

In terms of age of the household head, the households visiting the Salt River lakes had the highest proportion of those visiting the area set who were in the 21 to 30 age group. Again, the activity orientation at this set no doubt explains this finding.

3. Middle distance lakes--The middle distance lakes were visited by 22 percent of the 116 water-based recreating households principally for the purpose of fishing and/or boating. These households visited this area on the average of 2.52 times during the year, typically for two days per visit. Therefore, they would be characterized as infrequent overnight visitors in terms of their visitation in this area set. As was the case in all other area sets, the typical use of the area by Tucsonans occurred on the weekends.

   In terms of socioeconomic characteristics, households which visited the middle distance lakes were found to be typical of the general water-based recreating households.

4. White Mountains--The White Mountains, due to their ability to provide a broad range of recreational activities and their unique resource orientation, provide an interesting manifestation of recreational consumer demand behavior. This area set was the second most popular area in terms of the number of households

in the sample. Forty-eight percent of the water-based recreators visited the White Mountains and their range of activity participation was so widely distributed that it is difficult to specify one activity as the principal activity demand for this area. The White Mountains were the least frequently visited area set from among the sets, but the average stay per visit was the longest of any of the sets. This would seem to indicate that a large number of households were willing to overcome the "cost" of obtaining a recreation experience in the White Mountains, but were unwilling or did not do so very often during the year. However, when they did decide to go to the mountains they stayed there for a relatively long time. White Mountain visitors can, therefore, be characterized as infrequent, but relatively long stay visitors.

The socioeconomic characteristics of households visiting the White Mountains were generally similar to other water-based recreators with the exception that proportionately more of the households visiting this area were composed of two or less members, as compared to the proportions manifested at the other area sets. This would seem to further substantiate the finding that the White Mountains have the broadest demand in terms of activities and relative to socioeconomic factors.

5. Distant lakes--The distant lakes were visited by the least number--24 or 21 percent--of water-based recreators in the sample. Somewhat surprisingly, those households which did visit there did so principally for the purpose of sight-seeing and the

visit was usually of a supplementary nature in that the visit was primarily motivated by another goal. The recreational product of this area thus might be conceptualized as a "by-product" and demand for it by Tucsonans analyzed in this context. This would have to be taken into account when considering the willingness of recreational consumers to overcome the "cost" of visiting this area set.

Households visiting the distant lakes did so on the average of two times during the year for an average of two days per visit. They are thereby characterized as being infrequent, overnight visitors.

Typically, households visiting the distant lakes were middle-age and older couples who were on a sight-seeing or otherwise motivated trip.

The "Market Basket" of Rural, Water-Based Recreation Purchases: Summary

The second analytical approach followed in this research was to examine area visitation patterns by individual households. Since each area set represented a different recreation product, this approach examined the mix of such products acquired by each participating household and related these revealed preferences to socioeconomic characteristics of the household.

Although 11 different statistical computer runs were accomplished, five of the runs appear to be the most informative and meaningful and are summarized below.

Area Visitation Patterns. Forty-four percent of the water-based recreating households went to only one area set and this was principally the local lakes. This followed what was expected *a priori* since this type of visitation behavior standing alone would involve the least "cost" of the visitation patterns. Fifty-one percent of the people who visited only one area set visited the local lakes.

Thirty-one percent of the water-based recreating households visited two area sets and 25 percent visited three or more. Taken together, 56 percent of water-based recreating households were visitors to two or more area sets. This indicates a relatively high propensity for water-based recreating households to recreate and to do so at more than one area set, as defined in this research. As such, Tucson households appear to manifest a demand of significant magnitude for water-based recreation resources.

Activity Participation. Although there was a wide distribution of activity preferences among non-urban, water-based recreating households, the data indicate that as the number of area sets visited increased the orientation toward water-using activities tends also to increase. For example, those households visiting only one area set appear to have no specific activity preference and, as a group, participated in a wide range of activities. Yet, those households which visited a wide variety of area sets appear to have been motivated more strongly by a preference for a particular water-using activity such as swimming, water-skiing, boating, and/or fishing.

Frequency of Visits. The character of the visit by households also changed as the number of area set visits increased. As a group,

the non-urban, water-based recreators were characterized as being infrequent day recreators, but this changes somewhat when considering households that manifested particular visitation patterns. For example, 75 percent of all water-based recreators were found to be infrequent visitors, but 90 percent of those households which visited more than two area sets were either frequent or very frequent recreators. Underlying this, these households apparently exhibit a strong activity preference which motivates them to recreate more often.

Socioeconomic Characteristics of the Purchasers of Each "Mix" of Recreation.

1. Income--Income characteristics of those households visiting in one, two, or a multiple of area sets indicate a direct relationship in terms of their visitation patterns. As Table 37 depicts, 41 percent of the households visiting only one set are found in the less than $6,000 average annual gross income group, while 41 percent of the households visiting a multiple of area sets are in the $10,000 and above income ranges. Within the $6,000 to $9,999 income range, as the number of area sets visited increases, so do the proportion of households within the visitation pattern.
2. Education--Though there is a clear relation between education of the household head and area visitation pattern as Table 38 shows, the degree to which the relation is expressed through income levels is not revealed by this analysis. The hypothesis is suggested that education tends to broaden recreational participation and visitation patterns for given income levels.

Table 37. Area Visitation Patterns Compared to Income by Households.

Visitation Patterns	Income Ranges					
	Less than $3,000	$3,000-$5,999	$6,000-$9,999	$10,000-$14,999	$15,000- and over	Total
	(Percent)					
Single area set only (n = 51)	14	37	29	10	10	100
Pair of area sets (n = 36)	6	25	38	17	14	100
Multiple area sets (n = 29)	0	17	42	31	10	100
Total (n = 116)	8	28	36	16	12	100

Table 38. Area Visitation Patterns Compared to Education of Household Head.

Visitation Patterns	Education Level in Years				
	Less than 8	9-12	13-16	More than 16	Total
	(Percent)				
Single area only (n = 51)	26	33	33	8	100
Pair of area sets (n = 36)	14	39	30	17	100
Multiple area sets (n = 29)	3	48	45	4	100
Total (n = 116)	16	39	35	10	100

The empirical data collected for this study are not sufficiently sophisticated or precise to substantiate this hypothesis statistically. Further research into this hypothesis is warranted.

3. Household Size--Household size may have a bearing on the number of areas which a household may visit. Table 39 indicates the proportion of household sizes within the respective visitation patterns. The data indicate that: (1) the proportion of households of two or less members decreases as the number of area sets visited increases, and (2) as the number of area sets visited increases, the proportion of households of six or more members also increases. This would seem to refute the hypothesis that the larger the household the greater the restraint on distance of travel from Tucson for outdoor recreation. However, the manner by which the basic data on this point were gathered in the household survey casts doubt on the interpretation of the relations revealed in Table 39. A possible explanation for the proportional increases in household size as the number of area sets visited increases may lie in the greater probability in a larger household of individual members will have visited different areas, thus tending to classify large households as multiple-area visiting households.

Conclusions

Results of this research indicate that Tucsonans are active outdoor recreators as it is defined herein. In addition, within the mix of this recreation purchased by them they include a considerable

Table 39. Area Visitation Patterns Compared to Size of Household.

Visitation Patterns	Household Size			
	2 or less	3-5	6 or more	Total
	(Percent)			
Single area sets only (n = 51)	43	45	12	100
Pair of area sets (n = 36)	31	52	17	100
Multiple area sets (n = 29)	17	52	31	100
Total (n = 116)	33	49	18	100

amount of non-urban, water-based outdoor recreation. Not only were 82 percent of the sample recreators, but 52 percent were non-urban, water-based recreators.

Generally, Tucsonans are household or family recreationists that participate in any one activity infrequently during the year, but who, in their aggregate purchases of recreational activities, may be described as frequent recreators (4.0 to 7.0 times during the year). They usually participate in non-urban, water-based recreation on the weekends on a one-day outing.

The extent to which families or households participate in outdoor recreation is closely related to the socioeconomic characteristics of income, household size, the number of children, age, education, and activity orientation. However, this relationship is multivariant since advanced age, physical disability, or lack of leisure time will thwart the propensity to engage in outdoor recreation with higher levels of income. Furthermore, levels of education and income are themselves interrelated, thus jointly related to recreation participation.

In general, socioeconomic characteristics were found to be associated with activity and area orientations since (1) lower income groups tended to participate in least "cost" activities such as picnicking, driving for pleasure or urban-oriented outdoor activities; (2) household size tended to be related to activity orientation; (3) limited leisure time tended to be associated with activities which required little such time; (4) specialized activities requiring specialized areas, physical ability, or equipment tended to exhibit a multivariant relationship with ability of the "consumer" to pay in terms of income and

leisure time as well as age; and (5) area visitation and its related "cost" (travel "cost" and leisure time expenditure) generally bore a direct relation to income and the availability of leisure time. Thus, the conclusion can be drawn that water-based outdoor recreation participation in general is related to the socioeconomic parameters employed in this research.

Classifying and defining area sets on the basis of travel distance from Tucson and activity orientation tending to predominate at each met with but modest success. However, the findings indicated (1) a tendency for the number of households visiting an area set to be related inversely to its distance from Tucson and (2) a tendency for area sets to display somewhat different mixes of activities. Statistical validation and quantification of these relationships were not possible in this study due to the smallness of sample size. The White Mountains, because of the broad range of activities produced there, and the Salt River lakes, because of the water-skiing and boating orientation at this set, deserve further research into the nature of the demand for and supply of the recreation consumed at each.

Analysis of households which visited in particular visitation patterns provided the observations that: (1) as orientation toward directly water-using activities, that is, fishing and boating, increased so did the tendency of households to visit a multiple of areas; and (2) as household size and income increased so also did the tendency for households to visit a multiple of areas. Though households of three to five member size and of middle-income range predominated in all area visitation patterns, as the number of area sets visited increased the

proportionate distributions in the upper ranges of these variables tended also to increase.

Because of the small sample size and subsequent small number of observations in cells of several area visitation patterns, few validated inferences can be made in this phase of the analysis.

Critical Appraisal of the Methodology

Empirical data obtained in this study indicated that both activity participation and area visitation were related to the "cost" involved as derived from the distance from Tucson, as well as income levels, available leisure time, the nature of the activity preference, and other socioeconomic factors believed to be influencing recreational participation. Problems arise in a descriptive work such as this, however, in weighing the influence quantitatively. This was not the intent here, but the study has shown the need for considering the interrelatedness of factors and the necessity for establishing a method of determining just how much each factor is affecting recreational participation. For example, the high income conducive to recreation was present in some cases, but advanced age counteracted this effect, such that the hypothesized influence was not seen. The general relationships were evident, but the necessary combinations were difficult to derive.

In other words, all socioeconomic factors interrelate with one another and determination of the effect they are having on recreational participation requires that the data be gathered in such a way that all factors but one be held constant while that one is allowed to vary; the observed influence of each factor, in turn, on recreational participation

can then be observed. This would seem to call for stratification of the population for sampling purposes and then subjecting the empirical data to factor analysis or regression techniques.

The sampling procedure followed in this research appears to have been procedurally correct; however, the sample size was too small in terms of the analytical approaches to which the data was subjected. In this instance, this could not be helped and the results derived do offer indications as to the direction subsequent efforts should take. Lack of knowledge as to the correct procedure and ranges for obtaining data on qualitative and quantitative variables, as well as lack of standardization within the recreational field, have made analysis of the data difficult. In many cases, such as was necessary for frequency and length of stay in multiple set visitations heroic assumptions were necessary. Even though this type of situation is not unique to this study, it does indicate that careful consideration must be given to sampling procedures and data collection when sets and subsets of behavioral patterns are to be analyzed. In a descriptive sense, this set and subset approach appears to have served a useful purpose because it indicated the complex character of area visitations that consumers make in meeting their total recreation demands.

Because of the unique relationship in recreational activity between production and consumption as well as intercorrelations between supply and demand, this research has shown that great care must be taken in differentiating between area demand and activity demand. They are not mutually exclusive and area demand is basically a "derived" demand based on demand for recreational experiences or activities. For this

reason, it is felt that demand analysis should first take place in terms of recreational activities in much the same fashion as was followed in the general survey of this research. In using the same locational population, it is possible to assume that travel costs are similar for all segments of the population. Hence, manifested demand for activities will depend on quantitative and qualitative socioeconomic factors. When activity participation in days is regressed on socioeconomic factors derived from a stratified population, the results should indicate the impact that these factors have on recreational participation. Projecting the magnitudes of these variables into the future and injecting their values into the derived equations would then provide an estimate of future activity participation based on socioeconomic factors.

This approach avoids determination of an explicit "proxy" price in terms of travel cost but implicitly involves this variable. The activity participation equations would be derived given the currently existing availability of recreational sites and associated facilities. Time series equations and the changes in the socioeconomic coefficients of the equations as the supply of sites and facilities change over time might offer clues as to the influence the supply has on the propensity of the population to recreate giving socioeconomic characteristics. In effect, this would be indicating the impact of the "cost" as measured in travel costs and time.

In conclusion, as a first descriptive analysis the approach adopted in this study appears to be informative, but it is static in nature. What must follow is an expansion of the data obtained and its reorganization into a form which will not only describe, but indicate

more precisely functional relationships for predictive purposes. The derivation of these causal relationships based primarily on socioeconomic factors may eventually permit determination of a classic economic demand function based on the initial conceptualization of this study. In the interim, however, and before this can be accomplished is the necessity for determining what it is that is of value to the recreator and what factors influence the expression of this preference. Unlike other economic goods and services, there appears to be a unique relationship between recreation and leisure time that can outweigh "ability to pay" in strictly economic variables. These relationships appear to need far greater exploration before economic demand functions which are meaningful can be derived. For these and other reasons, the quest for such functions might, for the time being, emphasize theoretical and empirical determination of the interrelationships between what the recreator considers he is buying and the factors which appear to express its value to him, in addition to any values measured by market-derived dollar expenditures.

APPENDIX I

PRECONDITIONING LETTER

THE UNIVERSITY OF ARIZONA
TUCSON, ARIZONA 85721

COLLEGE OF AGRICULTURE
DEPARTMENT OF WATERSHED MANAGEMENT

Dear

The Agricultural Economics and Watershed Management Departments of The University of Arizona are conducting a survey of residents of the Tucson area. The purpose of the survey is to find out how Tucsonans use their leisure time and what outdoor recreation activities they enjoy doing. This information will be useful for planning future recreation development in Arizona.

Your family is a member of a randomly selected sample of 100 families in the Tucson area. Within the next few weeks you will be contacted by Mr. Carter Cox, a University graduate research assistant, for a personal interview that will take about 30 minutes of your time. Your cooperation in this survey will be very much appreciated.

If you have any questions about the survey, please contact me.

Thank you.

Sincerely yours,

David A. King
Associate Professor

DAK:ec

APPENDIX II

THE GENERAL SCHEDULE
* * *
TUCSON METROPOLITAN AREA
OUTDOOR RECREATION SURVEY

CONFIDENTIAL

COVER SHEET
TUCSON METROPOLITAN STUDY

INTERVIEWER_____

ADDRESS OF INTERVIEWER_____

DATE OF INTERVIEW_____ LENGTH_____

HOUR OF INTERVIEW_____

INTERVIEW NUMBER_____ (Only if Complete)

SAMPLE NUMBER_____ (Completed Interview or not)

SPECIFIC PERSON INTERVIEWED_____
(Position in Family)

REASON FOR NO INTERVIEW:

_____1. RESPONDENT ABSENT

_____2. REFUSAL

_____3. FOR OTHER REASONS (EXPLAIN BELOW)

FOR REFUSALS (BEST ESTIMATE OF):

1. AGE
2. EDUCATION
3. INCOME
4. RECREATION PARTICIPATION YES_____ NO_____
5. RECREATION EQUIPMENT
   _____
   _____
   _____
   _____
6. OTHER:

SPACE FOR COMMENTS ABOUT INTERVIEW (INTERVIEWEE'S ATTITUDE, ETC.)

_____

_____

_____

Questionnaire
1967 Tucson Metropolitan Recreation Survey

1. a. Are you a permanent resident of Tucson? Yes_____ No_____
(IF NO, EXPLAIN THAT THEY ARE NOT ELIGIBLE MEMBERS OF THE SAMPLE, THANK THEM AND LEAVE.)

b. IF YES, how long have you lived in Tucson

Months-Years_____

2. (HAND CARD A TO INTERVIEWEE) Here is a list of outdoor recreation activities that some people enjoy.

a. In the last 12 months (or months indicated in 1b) have any members of your immediate family participated in any of the activities on the list, away from home? Yes_____ No_____

b. How many family members participated in _____ during the past 12 months (OR AS INDICATED IN 1B)?

c. Who in the family participated? (Husband, Wife, Son, Daughter)

d. About how many times did they _____ or do _____?

e. When _____ (Family Member) _____ (Activity), about how long does he, she, you, they, usually stay?

List of Activities	(2a) Partic-ipated	(2b) No. of Family Members	(2c) Identity of Participant	(2d) Frequency 0-1, 4-4 8-more	(2e) Time Stayed
SWIMMING					
FISHING					
BOATING					
WATER-SKIING					
CAMPING					
HUNTING					
HIKING					
NATURE WALKS					
PICNICKING					
HORSEBACK RIDING					
BICYCLING					
DRIVING FOR PLEASURE					
SIGHT-SEEING					
WALKING FOR PLEASURE					
PLAYING GOLF					
PLAYING BASEBALL					
PLAYING TENNIS					
PLAYING OTHER GAMES OR SPORTS					

List of Activities	(2a) Partic-ipated	(2b) No. of Family Members	(2c) Identity of Participant	(2d) Frequency 0-1, 4-4 8-more	(2e) Time Stayed
ATTENDING OUTDOOR SPORTS EVENTS					
ATTENDING OUTDOOR CONCERTS					

f. Which one of these activities is the family (the individual's) favorite? _____

3. What equipment does your family have that is used for recreational purposes?

_____

_____

_____

4. Is all of this equipment used only for your recreation activities or is some of it used on other occasions? Explain.

_____

_____

_____

5. Approximately how much does your family have invested in such equipment?

$_____

6. (HAND CARD B TO INTERVIEWEE) Here is a list of things that sometimes influence the recreational activities that families engage in. Could you tell me which of these are important in your case?

_____

_____

a. Cost
b. Available time
c. Available facilities
d. Family responsibilities
e. Family participation
f. Differing recreational interests in the family
g. Religious responsibility
h. Health
i. Other _____

_____

(a) Which factor is most important?

_____

Why? _____

_____

(b) Does this tend to limit or encourage your participation in your family's favorite activity?

_____

_____

_____

(c) If you could do as you please, what activity would your family most prefer to do, or do more of?

_____

_____

7. (HAND CARD C TO INTERVIEWEE) Here is a list of recreation areas that I wish to ask you some questions about.

a. Are there any areas in Arizona that anyone in your family visited during the past 12 months that are not on this list? (IF YES, ADD TO LIST OF AREAS.)

b. In the past 12 months has anyone in your family visited any of these areas?

c. How many family members visited _____?

d. Who in the family visited _____?

e. About how many times did they visit _____?

f. How long do they usually stay on a visit to _____ (Place)

_____? (Days-Hours)

g. What do they (you) usually do at _____?

h. When do they (you) usually go, on weekends, weekdays, evenings, or vacations _____?

i. For about how many years have they (or you) been visiting _____?

j. Of all these areas, which one does your family like best?

_____

Why _____

_____

k. Do you consider this area best for your family's favorite activity?

Yes_____ No_____

(IF NOT, WHY)_____

_____

Which one is best for your family's favorite activity?

_____

_____

List of Areas	(9b) Visited	(9c) No. of Members	(9d) Iden- tity	(9e) Fre- quency	(9f) Length	(9g) Act.	(9h) Time	(9i) Years
1 SABINO CANYON								
2 MT. LEMMON (Other than Rose Canyon)								
3 CHIRICAHUA MTS. (Other than Rucker Lake)								
4 MADERA CANYON								
5 GRAHAM MTS. (Other than Riggs Lake)								
6 TUCSON MTS.								
7 WHITE MTS.								
8 ROOSEVELT LAKE								
9 APACHE LAKE								
10 CANYON LAKE								
11 SAGUARO LAKE								
12 PARKER CANYON LAKE								
13 PENA BLANCA LAKE								
14 ROSE CANYON LAKE								
15 SAN CARLOS LAKE								
16 LAKE PLEASANT								
17 LAKE MARY								
18 LAKE HAVASU								
19 LAKE MOHAVE								
20 LAKE MEAD								
21 LAKE POWELL								
22 RUBY LAKE								
23 RIGGS LAKE								
24 RUCKER LAKE								
25 HORSESHOE LAKE								
26 PAINTED ROCK RESERVOIR								
27 BARTLETT RESERVOIR								
28 PATAGONIA								

List of Areas	(9b) Visited	(9c) No. of Members	(9d) Iden-tity	(9e) Fre-quency	(9f) Length Act. Time	(9g)	(9h)	(9i) Years
29 OTHERS IN ARIZONA:								
OUTSIDE OF ARIZONA:								
30 GULF								
31 ROCKIES								
32 NORTHWEST								
33 CALIFORNIA								
34 OTHER:								

Activity Code

Swimming	1	Bicycling	11
Fishing	2	Driving for pleasure	12
Boating	3	Sight-seeing	13
Water-Skiing	4	Walking for pleasure	14
Camping	5	Playing golf	15
Hunting	6	Playing baseball	16
Hiking	7	Playing tennis sport	17
Nature Walks	8	Other games	18
Picnicking	9	Attending outdoor sports	19
Horseback Riding	10	Attending outdoor concerts	20

CROSS CHECK (9f) WITH (2a)

8. If your favorite area was closed or became overcrowded, what other area would you visit? _____

   Why? _____

   _____

9. What are some of the important things that your family looks for in choosing a recreation area?

   _____

   _____

   _____

   _____

10. (HAND CARD D TO INTERVIEWEE) Here is a list of things some people think are important in choosing a recreation area. Are there any on the list you may have forgotten to mention?

a. CONVENIENT	_____
b. AESTHETICS	_____
c. FACILITIES	_____
d. COST	_____
e. TRAVEL TIME	_____
f. ROADS	_____
	_____

Which of the above factors is the most important in choosing a recreation area? _____

Why? _____

_____

11. Would you go somewhere else than (NAME OF FAVORITE AREA) _____ _____ if the entrance fees at that area were _____ per person per day?

	YES	NO
a. $ .25	_____	_____
b. $ .50	_____	_____
c. $ .75	_____	_____
d. $1.00	_____	_____
e. $1.50	_____	_____
f. $2.00	_____	_____
g. $2.50	_____	_____
h. $3.50	_____	_____
i. $5.00	_____	_____

Which area would you go to instead? _____

12. If it became necessary for public agencies to acquire more revenue for the development of recreation areas, what do you think would be the best method?

a. Increased general taxes
b. Higher entrance fees
c. Both
d. Taxes on recreation equipment

Would you mind telling me why you think that would be the best method?

_____

_____

_____

This completes most of the questions about your recreational activities. Now we would like to know a little more about you and your family so that we can evaluate some of the reasons for your particular interests.

13. Where were you born? City_____
State_____

Your spouse? City_____
State_____

14. How long have you been a resident of Arizona _____years _____months.

15. (IF INTERVIEWEE HAS MOVED TO TUCSON WITHIN LAST 12 MONTHS) Have your outdoor recreational activities changed since you moved here?
Yes_____ No_____
If yes, in what manner?_____

_____

Why?_____

_____

16. As a child under 18, did you ever participate in any form of non-urban outdoor recreation?

Yes_____ No_____

Did your spouse? Yes_____ No_____

17. Where did you live during most of your childhood?

	HUSBAND	SPOUSE
1. On Farm	_____	_____
2. Rural Nonfarm	_____	_____
3. Village or City under 10,000	_____	_____
4. City of 10,000 to 99,999	_____	_____
5. City of 100,000 to 499,999	_____	_____
6. City of 500,000 and over	_____	_____

18. How many years of school has each member of your family completed?

Husband_____
Wife_____
Children:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

19. Could you give me the ages and sexes of the members of the family?

	AGE	SEX
Husband	_____	
Wife	_____	
Children:		
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____

20. Do any members of your family belong to the Boy Scouts, Girl Scouts, 4H or attend any kind of summer camp?

Yes_____
No_____

21. Do any members of your family belong to any outdoor oriented clubs such as hiking, horseback riding, jeep or rod or gun clubs?
Yes_____
No_____

22. What is the occupation of the head of the family?_____

23. What is the average workweek of the family head ____days ____hours
(IF WIFE HOLDS JOB) Spouse ____days ____hours

Has this changed in the last three years Yes_____ No_____

24. (IF YES) Has it increased or decreased? _____

25. (IF INTERVIEWEE HAS MORE THAN ONE DAY OFF PER WEEK) Do your days off come together, like on a weekend (Saturday and Sunday) or are they spread apart like one day during the week and one day on the weekend?

Together_____ Apart_____

26. Does the head of the family receive a paid vacation?
Yes_____ No_____

(IF YES) How long is it?
Has the amount of paid vacation you receive changed in the past three years? Yes_____ No_____

(IF YES) Has it increased or decreased? _____

27. When you take your vacation, do you usually take it all at once or do you tend to spread it out throughout the year?

_____

In what season do you usually take your vacation?

_____

28. (HAND CARD E TO INTERVIEWEE) The average family income level before taxes from all sources for the last 12 months was:

a. Less than $3,000
b. $3,000 to $5,999
c. $6,000 to $9,999
d. $10,000 to $14,999
e. $15,000 and over

29. What has been the average family income level before taxes from all sources for the past five years (To be taken from the same card) _____

30. What are your family income expectations for the next five years?

a. Same
b. Increase
c. High increase
d. Decrease

THANK YOU FOR YOUR COOPERATION IN THE SURVEY

APPENDIX III

FIRST (GENERAL) CODE FOR RECREATION SURVEY SCHEDULES

TUCSON OUTDOOR RECREATION SURVEY CODE SHEET

Column	Code
1-3	Schedule Number (001-300)
4-5	Schedule Subcard # (01-37)
6	Permanent Resident 0-No 1-Yes
7-8	Years of Residence in Tucson 0-(0-11 months) 1-(1-1 year 11 months) etc.
9	Participant 0-No 1-Yes
10-29	Activity Participation 0-No 5-Family 1-Husband 6-Children 2-Wife 7-Husband and Wife 3-Son 8-Parent and Children 4-Daughter 9-Other
30-49	Activity (Number of family participants) 0-0 1-1 ↓ 9-9 (or more)
50-69	Frequency of Participation in Activities 0-0 1-(1-3) times 2-(4-7) times 3-8 or more
70-71	Family's favorite activity 01-20; activities 00-No favorite 22-A division
72	Equipment 0-No 1-Yes

Column	Code
73	Equipment use (for recreation) 0-No 1-Yes
74-77	Value of Equipment
Sub-card #2	
1-3	Schedule Number (001-300)
4-5	Schedule Sub-card #(01-36)
6-14	Influences on recreation activities 0-No 1-Yes
15-16	Factor that is most important (01-12)
17	Limit or encourage activity (is most important) 0-No answer 1-Limit 2-Encourage
18-19	Activity would most prefer to do unrestrained (01-20)
20-25	Factors important in choosing a recreation area 0-No 1-Yes
26	Most important factor in area choice 1 2 3 4 5 6 7-Other
27	Best method for revenue collection 0-No answer 1-a 2-b 3-c 4-d 5-Other

Column	Code
28-29	Years of residence in Arizona 00-0-11 Months 01-1-1 Year 11 months ↓ etc.
30	Change in recreation since moving to Tucson 0-No 1-Yes
31	Participation in non-urban recreation as child under 18 (husband) 0-No 1-Yes 2-N/A
32	Same as above (Spouse) 0-No 1-Yes 2-N/A
33	Place of Residence in Childhood (Husband) 1-On farm 2-Rural nonfarm 3-City <10,000 4-10-99,000 5-100,000-499,000 6-500,000>
34	Place of residence in childhood (Spouse) 1-On farm 2-Rural nonfarm 3-City <10,000 4-10-99,000 5-100,000-499,000 6-500,000>
35-36	Year of education of husband (01-??)
37-38	Years of education of spouse (01-??)
39-40	Age of oldest child (01-??)
41-42	Age of youngest child (0-??)

Column	Code
43	Number of children 0-None ↓ 9-9 or more
44-45	Family size (01-??)
46	Membership in Boy Scouts, etc. 0-No 1-Yes
47	Membership in outdoor club 0-No 1-Yes
48-49	Occupation 0-Unemployed 1- ↓ (see census def.) 12-retired 13-Student
50-52	Average workweek of family head 50-days (1-7) 51-52-hours (01-??)
53-55	Average workweek of spouse 53-days (1-7) 54-55 hours (01-??)
56	Do husband and wife both work 0-No 1-Yes
57	Change in workweek last 3 years 0-No change 1-decrease 2-increase
58	Do days off come together or apart 1-Together 2-Apart
59	Paid Vacation 0-No 1-Yes
60-61	Length of paid vacation (weeks) (01-00)

Column	Code
62	Change in paid vacation in past 3 years 0-No change 1-Decrease 2-Increase
63	When taking vacation 0-No answer 1-All at once 2-Spread through the year
64	What season is vacation taken 1-Spring 2-Summer 3-Fall 4-Winter 5-Spread
65	Average Family Income 1-<$3,000 2-3-$5,999 3-6-$9,999 4-10-$14,999 5-$15,000>
66	Average income last 5 years 1-<$3,000 2-4-$5,999 3-6-$9,999 4-10-$14,999 5-$15,000>
67	Family Income Expectations 1-Same 2-Increase 3-High increase 4-Decrease
68-69	Which area does family like best (01-34)
70	Is this best for family's favorite 0-No 1-Yes
71	Ethnic Origin 0-Not specified 1-Spanish/American 2-Negro 3-Caucasian

Column	Code
72-73	Age of family head
74-75	Age of Spouse
	AREA ANALYSIS
1-3	Schedule # (001-300)
4-5	Sub-card # (01-36)
6	Visitation 0-No 1-Yes
7-8	# of family members visiting 0-0 1-1 ↓ 9-9 (or more)
9	Identity 0-No one 1-Husband 2-Wife 3-Son 4-Daughter 5-Family 6-Children 7-Husband and wife 8-Parent and children 9-Other
10	Frequency of visit 0-Nothing 1→ (1-3) 2→ (4-7) 3→ 8 or more
11-14	Length of stay 11-12 (days) 13-14 (hours)
15-34	Activity participation 0-No 1-Yes
35	When do you usually go 1-Weekdays 2-Weekends 3-Vacation

Column	Code
36	How many years been visiting 0-No answer 1- ↓ 9-9 years (or more)
79-80	Area identification
Sub-card #37	
1-3	Schedule # (001-300)
4-5	Sub-card # (01-37)
6-45	Time spent at activities 01-50 →days 51-?? →hours Where each activity requires two columns

APPENDIX IV

SECOND OR NON-URBAN, WATER-BASED RECREATION CODE FOR COMPUTER PROGRAM

Water-Based Recreation Analysis Code Sheet

Column	Code
1-3	Sample unit
4-5	Sub-card number
6-11	Area code 01 02 03 10 11
12-13	Activity Code 1 - swimming boating water-skiing 2 - fishing boating 3 - camping hiking nature walks 4 - picnicking 5 - sight-seeing 6 - (1, 2) 7 - (1, 4) 8 - (2, 3) 9 - (2, 4) 10 - (4, 5) 11 - (3, 4) 12 - (3, 5)
14	Income 1 - less $3,000 2 - $3-5,999

Column	Code
	3 - $6-9,999
	4 - $10-14,999
	5 - $15,000 and over
15	Household Size
	1 - 2 or less
	2 - 3 to 5
	3 - 6 or more
16	Age of household head
	1 - <20
	2 - 21 to 30
	3 - 31 to 40
	4 - 41 to 50
	5 - 51 to 60
	6 - 61 or more
17	Number of Children
	1 - 0
	2 - (1-3)
	3 - (4 or more)
18	Length of Stay
	1 - hours
	2 - day
	3 - day and night
	4 - 2 overnights
	5 - 3 overnights or more
	6 - combination

Column	Code
19	Time of Visit 1 - weekday 2 - weekend 3 - vacation 4 - combination
20	Frequency of Visit 1 - (1-3) 2 - (4-7) 3 - (8 or more) 4 - combination
21	Average Workweek of Head (days) 1 - 0 2 - 5 (with days off together) 3 - 5 (with days off separated) 4 - 6 days 5 - 7 days
22	Education of Head 1 - 8 years or less 2 - (9-12 years) 3 - (13-16 years) 4 - (17 or more)
23	Most Important Factor in Area Choice 0 - no choice 1 - convenient 2 - aesthetics 3 - facilities

Column	Code
	4 - cost
	5 - travel time
	6 - roads
	7 - other
24-25	Households' Favorite Activity
	0 - no choice or divided
	1 - swimming boating water-skiing
	2 - fishing
	3 - camping hiking nature walks
	4 - picnicking
	5 - sight-seeing
	6 - other (urban)
28	Recreation Equipment
	1 - no
	2 - yes
29-30	Program Run Code
	01 - 1 only
	02 - 3 only
	03 - 10 only
	04 - 11 only
	05 - 2 only
	06 - pairs in 10
	07 - (1, 10)
	08 - pairs not 10
	09 - triples
	10 - quads, quints

APPENDIX V

COMPUTER PROGRAM RUNS

Computer Program Runs

Computer Run	Identification of Visitation Patterns	Sets Involved	Number of Households	Percent of Total Water Recreators in the Run
1	1. All singles[a]	1. Set 1, Set 2, Set 3, Set 4, Set 5	1.51	
	2. All pairs	2. Set 6, Set 6A, Set 7	2.36	100
	3. Other combinations	3. Set 8	3.29	
2	1. All singles	1. Set 1, Set 2, Set 3, Set 4, Set 5	1.51	75
	2. All pairs	2. Set 6, Set 6A, Set 7	2.36	
3	1. All singles[a]	1. Set 1, Set 2, Set 3, Set 4, Set 5	1.51	69
	2. Other combinations	2. Set 8	2.29	
4	1. All pairs	1. Set 6, Set 6A, Set 7	1.36	56
	2. Other combinations	2. Set 8	2.29	
5	1. Set 1 only[a]	1. Set 1	1.24	41
	2. Set 3 only	2. Set 3	2.11	
	3. Set 4 only	3. Set 4	3.12	
6	1. All singles	1. Set 1, Set 2, Set 3, Set 4, Set 5	1.51	66
	2. All pairs which include Set 4	2. Set 6, Set 6A	2.25	
7	1. Set 1 and Set 3	1. Set 1 and Set 3	1.35	40
	2. All pairs not with Set 4	2. Set 7	2.11	
8	1. All pairs which include Set 4[a]	1. Set 6 and Set 6A	1.25	31
	2. All pairs not with Set 4	2. Set 7	2.11	

Computer Run	Identification of Visitation Patterns	Sets Involved	Number of Households	Percent of Total Water Recreators in the Run
9	1. All pairs which include Set 4[a]	1. Set 6 and Set 6A	1.25	47
	2. Other combinations	2. Set 8	2.29	
10	1. Set 1 only	1. Set 1	1.24	46
	2. Set 4 only	2. Set 4	2.12	
	3. Pairs which include Set 1 and Set 4	3. Set 6A	3.17	
11	1. Set 1 only	1. Set 1	1.24	35
	2. Pairs which include Set 1 and Set 4	2. Set 6A	2.17	

a. Computer runs which are analyzed in Chapter V.

APPENDIX VI

FIVE PATTERNS OF AREA VISITATION RELATED TO THIRTEEN ATTRIBUTES OF RECREATORS INCLUDING CHI-SQUARE TESTS OF SIGNIFICANCE FOR EACH COMPARISON

Appendix Table 1

Visits to Any Two Areas That Include the White Mountains

Compared to

Visits to More Than Two Areas

Appendix Table 1a. Recreation Attribute: Income.

Visitation Pattern	Less Than $3,000	$3,000-$5,999	$6,000-$9,999	$10,000-$14,999	$15,000 and Over	Row Total
Pairs Which Include the White Mountains						
Observed frequency	2	9	7	4	3	25
Expected frequency	.93	6.48	8.80	6.02	2.78	
Row percent	8.00	36.00	28.00	16.00	12.00	
Column percent	100.00	64.29	36.84	30.77	50.00	
Multiple Areas						
Observed frequency	0	5	12	9	3	29
Expected frequency	1.07	7.52	10.20	6.98	3.22	
Row percent	0.00	17.24	41.38	31.03	10.34	
Column percent	0.00	35.71	63.16	59.23	50.00	
Column Total	2	14	19	13	6	54

Chi-square (cal) = 6.12 with four Degrees of Freedom
Chi-square (.05) = 9.49 with four Degrees of Freedom

Appendix Table 1b. Recreation Attribute: Household Size.

Visitation Pattern	2 or Less	3-5	6 or More	Row Total
Pairs Which Include the White Mountains				
Observed frequency	7	14	3	24
Expected frequency	5.43	13.13	5.43	
Row percent	29.17	58.33	12.50	
Column percent	58.33	48.28	25.00	
Multiple Areas				
Observed frequency	5	15	9	29
Expected frequency	6.57	15.87	6.57	
Row percent	17.24	51.72	31.03	
Column percent	41.67	51.72	75.00	
Column Total	12	29	12	53

Chi-square (cal) = 2.92 with two Degrees of Freedom
Chi-square (.05) = 5.99 with two Degrees of Freedom

Appendix Table 1c. Recreation Attribute: Age of Household Head.

Visitation Pattern	20 Years or Less	21-30 Years	31-40 Years	41-50 Years	51-60 Years	61 Years or More	Row Total
Pairs Which Include the White Mountains							
Observed frequency	2	5	7	4	3	4	25
Expected frequency	.93	4.63	6.94	6.48	3.24	2.78	
Row percent	8.00	20.00	28.00	16.00	12.00	16.00	
Column percent	100.00	50.00	46.67	28.57	42.86	66.67	
Multiple Areas							
Observed frequency	0	5	8	10	4	2	29
Expected frequency	1.07	5.37	8.06	7.52	3.76	3.22	
Row percent	0.00	17.24	27.59	34.48	13.79	6.90	
Column percent	0.00	50.00	53.33	71.43	57.14	33.33	
Column Total	2	10	15	14	7	6	54

Chi-square (cal) = 5.18 with five Degrees of Freedom
Chi-square (.05) = 11.07 with five Degrees of Freedom

Appendix Table 1d. Recreation Attribute: Number of Children.

Visitation Pattern	None	1-3	4 or More	Row Total
Pairs Which Include the White Mountains				
Observed frequency	9	13	2	24
Expected frequency	6.34	12.68	4.98	
Row percent	37.50	54.17	8.33	
Column percent	64.29	46.43	18.18	
Multiple Areas				
Observed frequency	5	15	9	29
Expected frequency	7.66	15.32	6.02	
Row percent	17.24	51.72	31.03	
Column percent	35.71	53.57	81.82	
Column Total	14	28	11	53

Chi-square (cal) = 5.32 with two Degrees of Freedom
Chi-square (.05) = 5.99 with two Degrees of Freedom

Appendix Table 1e. Recreation Attribute: Length of Stay.

Visitation Pattern	Hours	Days	Day and Night	Two Overnights	Three Overnights	Combination	Row Total
Pairs Which Include the White Mountains							
Observed frequency	2	2	5	0	2	14	25
Expected frequency	2.31	3.24	4.17	0.00	.93	14.35	
Row percent	8.00	8.00	20.00	0.00	8.00	56.00	
Column percent	40.00	28.57	55.56	0.00	100.00	45.16	
Multiple Areas							
Observed frequency	3	5	4	0	0	17	29
Expected frequency	2.69	3.76	4.83	0.00	1.07	16.65	
Row percent	10.34	17.24	13.79	0.00	0.00	58.62	
Column percent	60.00	71.43	44.44	0.00	0.00	54.84	
Column Total	5	7	9	0	2	31	54

Chi-square (cal) = 3.61 with five Degrees of Freedom
Chi-square (.05) = 11.07 with five Degrees of Freedom

Appendix Table 1f. Recreation Attribute: Time of Visit.

Visitation Pattern	Weekday	Weekend	Vacation	Combination	Row Total
Pairs Which Include the White Mountains					
Observed frequency	1	17	0	6	24
Expected frequency	.91	17.66	0.00	5.43	
Row percent	4.17	70.83	0.00	25.00	
Column percent	50.00	43.59	0.00	50.00	
Multiple Areas					
Observed frequency	1	22	0	6	29
Expected frequency	1.09	21.34	0.00	6.57	
Row percent	3.45	75.86	0.00	20.69	
Column percent	50.00	56.41	0.00	50.00	
Column Total	2	39	0	12	53

Chi-square (cal) = 0.17 with three Degrees of Freedom
Chi-square (.05) = 7.81 with three Degrees of Freedom

Appendix Table 1g. Recreation Attribute: Frequency of Visit.

Visitation Pattern	1-3	4-7	8 or More	Combination	Row Total
Pairs Which Include the White Mountains					
Observed frequency	20	0	1	4	25
Expected frequency	16.67	0.00	.93	7.41	
Row percent	80.00	0.00	4.00	16.00	
Column percent	55.56	0.00	50.00	25.00	
Multiple Areas					
Observed frequency	16	0	1	12	29
Expected frequency	19.33	0.00	1.07	8.59	
Row percent	55.17	0.00	3.45	41.38	
Column percent	44.44	0.00	50.00	75.00	
Column Total	36	0	2	16	54

Chi-square (cal) = 4.17 with three Degrees of Freedom
Chi-square (.05) = 7.81 with three Degrees of Freedom

Appendix Table 1h. Recreation Attribute: Average Workweek of Head (Days).

Visitation Pattern	None	5 (With Days Off Together)	5 (With Days Off Separated)	6 Days	7 Days	Row Total
Pairs Which Include the White Mountains						
Observed frequency	2	16	3	3	1	25
Expected frequency	2.31	16.67	1.39	3.24	1.39	
Row percent	8.00	64.00	12.00	12.00	4.00	
Column percent	40.00	44.44	100.00	42.86	33.33	
Multiple Areas						
Observed frequency	3	20	0	4	2	29
Expected frequency	2.69	19.33	1.61	3.76	1.61	
Row percent	10.34	68.97	0.00	13.79	6.90	
Column percent	60.00	55.56	0.00	57.14	66.67	
Column Total	5	36	3	7	3	54

Chi-square (cal) = 3.85 with four Degrees of Freedom
Chi-square (.05) = 9.49 with four Degrees of Freedom

Appendix Table 1i. Recreation Attribute: Education of Head.

Visitation Pattern	8 Years or Less	9-12 Years	13-16 Years	17 or More	Row Total
Pairs Which Include the White Mountains					
Observed frequency	3	8	8	6	25
Expected frequency	1.85	10.19	9.72	3.24	
Row percent	12.00	32.00	32.00	24.00	
Column percent	75.00	36.36	38.10	85.71	
Multiple Areas					
Observed frequency	1	14	13	1	29
Expected frequency	2.15	11.81	11.28	3.76	
Row percent	3.45	48.28	44.83	3.45	
Column percent	25.00	63.64	61.90	14.29	
Column Total	4	22	21	7	54

Chi-square (cal) = 7.14 with three Degrees of Freedom
Chi-square (.05) = 7.81 with three Degrees of Freedom

Appendix Table 1j. Recreation Attribute: Most Important Factor in Area Choice.

Visitation Pattern	No Choice	Con-venience	Aes-thetics	Facil-ities	Cost	Travel Time	Roads	Other	Row Total
Pairs Which Include the White Mountains									
Observed frequency	0	1	5	4	1	5	5	5	25
Expected frequency	0.00	1.44	3.37	5.77	1.44	6.25	2.88	3.85	
Row percent	0.00	4.00	20.00	16.00	4.00	20.00	20.00	16.00	
Column percent	0.00	33.33	71.43	33.33	33.33	38.46	83.33	50.00	
Multiple Areas									
Observed frequency	2	2	2	8	2	8	1	4	29
Expected frequency	0.00	1.56	3.63	6.23	1.56	6.75	3.12	4.15	
Row percent	0.00	7.41	7.41	29.63	7.41	29.63	3.70	14.81	
Column percent	0.00	66.67	28.57	66.67	66.67	61.54	16.67	50.00	
Column Total	2	3	7	12	3	13	6	8	54

Chi-square (cal) = 6.58 with six Degrees of Freedom
Chi-square (.05) = 12.59 with six Degrees of Freedom

Appendix Table 1k. Recreation Attribute: Favorite Activity of Household.

Visitation Pattern	No Choice	Swimming, Boating, Water-skiing	Fishing	Camping, Hiking, Nature Walks	Picnicking	Sightseeing	Other (Urban)	Row Total
Pairs Which Include the White Mountains								
Observed frequency	1	3	4	6	5	0	6	25
Expected frequency	0.00	4.24	4.24	6.12	2.82	0.00	6.59	
Row percent	0.00	12.50	16.67	25.00	20.83	0.00	25.00	
Column percent	0.00	33.33	44.44	46.15	83.33	0.00	42.86	
Multiple Areas								
Observed frequency	2	6	5	7	1	0	8	29
Expected frequency	0.00	4.76	4.76	6.88	3.18	0.00	7.41	
Row percent	0.00	22.22	18.52	25.93	3.70	0.00	29.63	
Column percent	0.00	66.67	55.56	53.85	16.67	0.00	57.14	
Column Total	3	9	9	13	6	0	14	54

Chi-square (cal) = 3.98 with five Degrees of Freedom
Chi-square (.05) = 11.07 with five Degrees of Freedom

Appendix Table 1m. Recreation Attribute: Ownership of Recreation Equipment.

Visitation Pattern	No	Yes	Row Total
Pairs Which Include the White Mountains			
Observed frequency	2	23	25
Expected frequency	1.85	23.15	
Row percent	8.00	92.00	
Column percent	50.00	46.00	
Multiple Areas			
Observed frequency	2	27	29
Expected frequency	2.15	26.85	
Row percent	6.90	93.10	
Column percent	50.00	54.00	
Column Total	4	50	54

Chi-square (cal) = .02 with one Degree of Freedom
Chi-square (.05) = 3.84 with one Degree of Freedom

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Appendix Table 1n. Recreation Attribute: Activity Participation.

Visitation Pattern	Swimming, Boating, Water-skiing	Fishing, Boating	Camping, Hiking, Nature Walks	Picnicking	Sightseeing	Combination 1&2	1&4	2&3	2&4	4&5	3&4	Row Total
Pairs Which Include the White Mountains:												
Observed frequency	1	4	1	2	0	3	1	2	1	7	2	24
Expected frequency	1.81	3.62	.45	.91	0.00	4.98	1.36	4.08	1.36	4.08	1.36	
Row percent	4.17	16.67	4.17	8.33	0.00	12.50	4.17	8.33	4.17	29.17	8.33	
Column percent	25.00	50.00	100.00	100.00	0.00	27.27	33.33	22.22	33.33	77.78	66.67	
Multiple Area:												
Observed frequency	3	4	0	0	0	8	2	7	2	2	1	29
Expected frequency	2.19	4.38	.55	1.09	0.00	6.02	1.64	4.92	1.64	4.92	1.64	
Row percent	10.34	13.79	0.00	0.00	0.00	27.59	6.90	24.14	6.90	6.90	3.45	
Column percent	75.00	50.00	0.00	0.00	0.00	72.73	66.67	77.78	66.67	22.22	33.33	
Column Total	4	8	1	2	0	11	3	9	3	9	3	53

Chi-square (cal) = 12.47 with ten Degrees of Freedom
Chi-square (.05) = 18.31 with ten Degrees of Freedom

Appendix Table 2

Visits to Any Two Areas That Include the White Mountains

Compared to

Visits to Any Two Areas That Do Not Include the White Mountains

Appendix Table 2a. Recreation Attribute: Income.

Visitation Pattern	Less Than $3,000	$3,000-$5,999	$6,000-$9,999	$10,000-$14,999	$15,000 and over	Row Total
Pairs Which Include the White Mountains						
Observed frequency	2	9	7	4	3	25
Expected frequency	1.39	6.25	9.72	4.17	3.47	
Row percent	8.00	36.00	28.00	16.00	12.00	
Column percent	100.00	100.00	50.00	66.67	60.00	
Pairs Which Do Not Include the White Mountains						
Observed frequency	0	0	7	2	2	11
Expected frequency	.61	2.75	4.28	1.83	1.53	
Row percent	0.00	0.00	63.64	18.18	18.18	
Column percent	0.00	0.00	50.00	33.33	40.00	
Column Total	2	9	14	6	5	36

Chi-square (cal) = 7.57 with four Degrees of Freedom
Chi-square (.05) = 9.49 with four Degrees of Freedom

Appendix Table 2b. Recreation Attribute: Household Size.

Visitation Pattern	2 or Less	3-5	6 or More	Row Total
Pairs Which Include the White Mountains				
Observed frequency	7	14	3	24
Expected frequency	7.54	12.34	4.11	
Row percent	29.17	58.33	12.50	
Column percent	63.64	77.78	50.00	
Pairs Which Do Not Include the White Mountains				
Observed frequency	4	4	3	11
Expected frequency	3.46	5.66	1.89	
Row percent	36.36	36.36	27.27	
Column percent	36.36	22.22	50.00	
Column Total	11	18	6	35

Chi-square (cal) = 1.79 with two Degrees of Freedom
Chi-square (.05) = 5.99 with two Degrees of Freedom

Appendix Table 2c. Recreation Attribute: Age of Household Head.

Visitation Pattern	20 Years or Less	21-30 Years	31-40 Years	41-50 Years	51-60 Years	61 Years or More	Row Total
Pairs Which Include the White Mountains							
Observed frequency	2	5	7	4	3	4	25
Expected frequency	1.39	4.17	8.33	4.17	2.78	4.17	
Row percent	8.00	20.00	28.00	16.00	12.00	16.00	
Column percent	100.00	83.33	58.33	66.67	75.00	66.67	
Pairs Which Do Not Include the White Mountains							
Observed frequency	0	1	5	2	1	2	11
Expected frequency	.61	1.83	3.67	1.83	1.22	1.83	
Row percent	0.00	9.09	45.45	18.18	9.09	18.18	
Column percent	0.00	16.67	41.67	33.33	25.00	33.33	
Column Total	2	6	12	6	4	6	36

Chi-square (cal) = 2.23 with five Degrees of Freedom
Chi-square (.05) = 11.07 with five Degrees of Freedom

Appendix Table 2d. Recreation Attribute: Number of Children.

Visitation Pattern	None	1-3	4 or More	Row Total
Pairs Which Include the White Mountains				
Observed frequency	9	13	2	24
Expected frequency	8.91	11.66	3.43	
Row percent	37.50	54.17	8.33	
Column percent	69.23	76.47	40.00	
Pairs Which Do Not Include the White Mountains				
Observed frequency	4	4	3	11
Expected frequency	4.09	5.34	1.57	
Row percent	36.36	36.36	27.27	
Column percent	30.77	23.53	60.00	
Column Total	13	17	5	35

Chi-square (cal) = 2.39 with two Degrees of Freedom
Chi-square (.05) = 5.99 with two Degrees of Freedom

Appendix Table 2e. Recreation Attribute: Length of Stay.

Visitation Pattern	Hours	Days	Day and Night	Two Overnights	Three Overnights	Combination	Row Total
Pairs Which Include the White Mountains							
Observed frequency	2	2	5	0	2	14	25
Expected frequency	2.78	3.47	4.17	0.00	1.39	13.19	
Row percent	8.00	8.00	20.00	0.00	8.00	56.00	
Column percent	50.00	40.00	83.33	0.00	100.00	73.68	
Pairs Which Do Not Include the White Mountains							
Observed frequency	2	3	1	0	0	5	11
Expected frequency	1.22	1.53	1.83	0.00	.61	5.81	
Row percent	18.18	27.27	9.09	0.00	0.00	45.45	
Column percent	50.00	60.00	16.67	0.00	0.00	26.32	
Column Total	4	5	6	0	2	19	36

Chi-square (cal) = 4.34 with five Degrees of Freedom
Chi-square (.05) = 11.07 with five Degrees of Freedom

Appendix Table 2f. Recreation Attribute: Time of Visit.

Visitation Pattern	Weekday	Weekend	Vacation	Combination	Row Total
Pairs Which Include the White Mountains					
Observed frequency	1	17	0	0	24
Expected frequency	1.37	15.09	.69	6.86	
Row percent	4.17	70.83	0.00	25.00	
Column percent	50.00	77.27	0.00	60.00	
Pairs Which Do Not Include the White Mountains					
Observed frequency	1	5	1	4	11
Expected frequency	.63	6.91	.31	3.14	
Row percent	9.09	45.45	9.09	36.36	
Column percent	50.00	22.73	100.00	40.00	
Column Total	2	22	1	10	35

Chi-square (cal) = 3.62 with three Degrees of Freedom
Chi-square (.05) = 7.81 with three Degrees of Freedom

Appendix Table 2g. Recreation Attribute: Frequency of Visit.

Visitation Pattern	1-3	4-7	8 or More	Combination	Row Total
Pairs Which Include the White Mountains					
Observed frequency	20	0	1	4	25
Expected frequency	20.14	0.00	.69	4.17	
Row percent	80.00	0.00	4.00	16.00	
Column percent	68.97	0.00	100.00	66.67	
Pairs Which Do Not Include the White Mountains					
Observed frequency	9	0	0	2	11
Expected frequency	8.86	0.00	.31	1.83	
Row percent	81.82	0.00	0.00	18.18	
Column percent	31.03	0.00	0.00	33.33	
Column Total	29	0	1	6	36

Chi-square (cal) = .46 with three Degrees of Freedom
Chi-square (.05) = 7.81 with three Degrees of Freedom

Appendix Table 2h. Recreation Attribute: Average Workweek of Head (Days).

Visitation Pattern	None	5 (With Days Off Together)	5 (With Days Off Separated)	6 Days	7 Days	Row Total
Pairs Which Include the White Mountains						
Observed frequency	2	16	3	3	1	25
Expected frequency	2.78	15.97	2.78	2.08	1.39	
Row percent	8.00	64.00	12.00	12.00	4.00	
Column percent	50.00	69.57	75.00	100.00	50.00	
Pairs Which Do Not Include the White Mountains						
Observed frequency	2	7	1	0	1	11
Expected frequency	1.22	7.03	1.22	.92	.61	
Row percent	18.18	63.64	9.09	0.00	9.09	
Column percent	50.00	30.43	25.00	0.00	50.00	
Column Total	4	23	4	3	2	36

Chi-square (cal) = 2.45 with four Degrees of Freedom
Chi-square (.05) = 9.48 with four Degrees of Freedom

Appendix Table 2i. Recreation Activity: Education of Head.

Visitation Pattern	8 Years or Less	9-12 Years	13-16 Years	17 or More	Row Total
Pairs Which Include the White Mountains					
Observed frequency	3	8	8	6	25
Expected frequency	3.47	9.72	7.64	4.17	
Row percent	12.00	32.00	32.00	24.00	
Column percent	60.00	57.14	72.73	100.00	
Pairs Which Do Not Include the White Mountains					
Observed frequency	2	6	3	0	11
Expected frequency	1.53	4.28	3.36	1.83	
Row percent	18.18	54.55	27.27	0.00	
Column percent	40.00	42.86	27.27	0.00	
Column Total	5	14	11	6	36

Chi-square (cal) = 3.90 with three Degrees of Freedom
Chi-square (.05) = 7.81 with three Degrees of Freedom

Appendix Table 2j. Recreation Attribute: Most Important Factor in Area Choice.

Visitation Pattern	No Choice	Con-venience	Aes-thetics	Facil-ities	Cost	Travel Time	Roads	Other	Row Total
Pairs Which Include the White Mountains									
Observed frequency	0	1	5	4	1	5	5	4	25
Expected frequency	0.00	2.78	4.17	4.17	1.39	5.56	3.47	3.47	
Row percent	0.00	4.00	20.00	16.00	4.00	20.00	20.00	16.00	
Column percent	0.00	25.00	83.33	66.67	50.00	62.50	100.00	80.00	
Pairs Which Do Not Include the White Mountains									
Observed frequency	0	3	1	2	1	3	0	1	11
Expected frequency	0.00	1.22	1.83	1.83	.61	2.44	1.53	1.53	
Row percent	0.00	27.27	9.09	18.18	9.09	27.27	0.00	9.09	
Column percent	0.00	75.00	16.67	33.33	50.00	37.50	0.00	20.00	
Column Total	0	4	6	6	2	8	5	5	36

Chi-square (cal) = 7.29 with six Degrees of Freedom
Chi-square (.05) = 12.59 with six Degrees of Freedom

Appendix Table 2k. Recreation Attribute: Favorite Activity of Household.

Visitation Pattern	No Choice	Swimming, Boating, Water-skiing	Fishing	Camping, Hiking, Nature Walks	Picnicking	Sightseeing	Other (Urban)	Row Total
Pairs Which Include the White Mountains								
Observed frequency	1	3	4	6	5	0	6	25
Expected frequency	0.00	5.49	4.80	4.11	3.43	0.00	6.17	
Row percent	0.00	12.50	16.67	25.00	20.83	0.00	25.00	
Column percent	0.00	37.50	57.14	100.00	100.00	0.00	66.67	
Pairs Which Do Not Include the White Mountains								
Observed frequency	0	5	3	0	0	0	3	11
Expected frequency	0.00	2.51	2.20	1.89	1.57	0.00	2.83	
Row percent	0.00	45.45	27.27	0.00	0.00	0.00	27.27	
Column percent	0.00	62.50	42.86	0.00	0.00	0.00	33.33	
Column Total	1	8	7	6	5	0	9	36

Chi-square (cal) = 9.06 with five Degrees of Freedom
Chi-square (.05) = 11.07 with five Degrees of Freedom

Appendix Table 2m. Recreation Attribute: Ownership of Recreation Equipment.

Visitation Pattern	No	Yes	Row Total
Pairs Which Include the White Mountains			
Observed frequency	2	23	25
Expected frequency	3.47	21.53	
Row percent	8.00	92.00	
Column percent	40.00	74.19	
Pairs Which Do Not Include the White Mountains			
Observed frequency	3	8	11
Expected frequency	1.53	9.47	
Row percent	27.27	72.73	
Column percent	60.00	25.81	
Column Total	5	31	36

Chi-square (cal) = 2.37 with one Degree of Freedom
Chi-square (.05) = 3.84 with one Degree of Freedom

Appendix Table 2n. Recreation Attribute: Activity Participation.

Visitation Pattern	Swimming, Boating, Water-skiing	Fishing, Boating	Camping, Hiking Nature Walks	Picnicking	Sightseeing	Combination 1&2	1&4	2&3	2&4	4&5	3&4	Row Total
Pairs Which Include the White Mountains:												
Observed frequency	1	4	1	2	0	3	1	2	1	8	2	25
Expected frequency	2.78	2.78	1.39	1.39	1.39	2.78	.69	2.78	2.08	5.55	1.39	
Row percent	4.00	16.00	4.00	8.00	0.00	12.00	4.00	8.00	4.00	32.00	8.00	
Column percent	25.00	100.00	50.00	100.00	0.00	75.00	100.00	50.00	33.33	100.00	100.00	
Pairs Which Do Not Include the White Mountains												
Observed frequency	3	0	1	0	2	1	0	2	2	0	0	11
Expected frequency	1.22	1.22	.61	.61	.61	1.22	.31	1.22	.92	2.44	.61	
Row percent	27.27	0.00	9.91	0.00	18.18	9.91	0.00	18.18	18.18	0.00	0.00	
Column percent	75.00	0.00	50.00	0.00	100.00	25.00	0.00	50.00	66.67	0.00	0.00	
Column Total	4	4	2	2	2	4	1	4	3	8	2	36

Chi-square (cal) = 13.01 with ten Degrees of Freedom
Chi-square (.05) = 18.47 with ten Degrees of Freedom

Appendix Table 3

Visits to Any Single Area
Compared to
Visits to More Than Two Areas

Appendix Table 3a. Recreation Attribute: Income.

Visitation Pattern	Less than $3,000	$3,000-$5,999	$6,000-$9,999	$10,000-$14,999	$15,000 and Over	Row Total
Single Areas						
Observed frequency	7	19	15	5	5	51
Expected frequency	4.46	15.30	17.21	8.93	5.10	
Row percent	13.73	37.25	29.41	9.80	9.80	
Column percent	100.00	79.17	55.56	35.71	62.50	
Multiple Areas						
Observed frequency	0	5	12	9	3	29
Expected frequency	2.54	8.70	9.79	5.08	2.90	
Row percent	0.00	17.24	41.38	31.03	10.34	
Column percent	0.00	20.83	44.44	64.29	37.50	
Column Total	7	24	27	14	8	80

Chi-square (cal) = 12.00 with four Degrees of Freedom
Chi-square (.05) = 9.49 with four Degrees of Freedom

Appendix Table 3b. Recreation Attribute: Household Size.

Visitation Pattern	2 or Less	3-5	6 or More	Row Total
Single Areas				
Observed frequency	22	23	6	51
Expected frequency	17.21	24.23	9.56	
Row percent	43.14	45.10	11.76	
Column percent	81.48	60.53	40.00	
Multiple Areas				
Observed frequency	5	15	9	29
Expected frequency	9.79	13.78	5.44	
Row percent	17.24	51.72	31.03	
Column percent	18.52	39.47	60.00	
Column Total	27	38	15	80

Chi-square (cal) = 7.51 with two Degrees of Freedom
Chi-square (.05) = 5.99 with two Degrees of Freedom

Appendix Table 3c. Recreation Attribute: Age of Household Head.

Visitation Pattern	20 Years or Less	21-30 Years	31-40 Years	41-50 Years	51-60 Years	61 Years or More	Row Total
Single Areas							
Observed frequency	1	8	10	12	11	9	51
Expected frequency	.64	8.29	11.48	14.03	9.56	7.01	
Row percent	1.96	15.69	19.61	23.53	21.57	17.65	
Column percent	100.00	61.54	55.56	54.55	73.33	81.82	
Multiple Areas							
Observed frequency	0	5	8	10	4	2	29
Expected frequency	.36	4.71	6.53	7.98	5.44	3.99	
Row percent	0.00	17.24	27.59	34.48	13.79	6.90	
Column percent	0.00	38.46	44.44	45.45	26.67	18.18	
Column Total	1	13	18	22	15	11	80

Chi-square (cal) = 4.08 with five Degrees of Freedom
Chi-square (.05) = 11.07 with five Degrees of Freedom

Appendix Table 3d. Recreation Attribute: Number of Children.

Visitation Pattern	None	1-3	4 or More	Row Total
Single Areas				
Observed frequency	22	23	6	51
Expected frequency	17.21	24.23	9.56	
Row percent	43.14	45.10	11.96	
Column percent	81.48	60.53	40.00	
Multiple Areas				
Observed frequency	5	15	9	29
Expected frequency	9.79	13.78	5.44	
Row percent	17.24	51.72	31.03	
Column percent	18.52	39.47	60.00	
Column Total	27	38	15	80

Chi-square (cal) = 7.51 with two Degrees of Freedom
Chi-square (.05) = 5.99 with two Degrees of Freedom

Appendix Table 3e. Recreation Attribute: Length of Stay.

Visitation Pattern	Hours	Days	Day and Night	Two Overnights	Three Overnights	Combination	Row Total
Single Areas							
Observed frequency	14	19	10	4	4	0	51
Expected frequency	10.84	15.30	8.93	2.55	2.55	10.84	
Row percent	27.45	37.25	19.61	7.84	7.84	0.00	
Column percent	82.35	79.17	71.43	100.00	100.00	0.00	
Multiple Areas							
Observed frequency	3	5	4	0	0	17	29
Expected frequency	6.16	8.70	5.08	1.45	1.45	6.16	
Row percent	10.34	17.24	13.79	0.00	0.00	58.62	
Column percent	17.65	20.83	28.57	0.00	0.00	100.00	
Column Total	17	24	14	4	4	17	80

Chi-square (cal) = 39.82 with five Degrees of Freedom
Chi-square (.05) = 11.07 with five Degrees of Freedom

Appendix Table 3f. Recreation Attribute: Time of Visit.

Visitation Pattern	Weekday	Weekend	Vacation	Combination	Row Total
Single Areas					
Observed frequency	10	39	2	0	51
Expected frequency	7.01	38.89	1.28	3.83	
Row percent	19.61	76.47	3.92	0.00	
Column percent	90.91	63.93	100.00	0.00	
Multiple Areas					
Observed frequency	1	22	0	6	29
Expected frequency	3.99	22.11	.73	2.18	
Row percent	3.45	75.86	0.00	20.69	
Column percent	9.09	36.07	0.00	100.00	
Column Total	11	61	2	6	80

Chi-square (cal) = 15.20 with three Degrees of Freedom
Chi-square (.05) = 9.81 with three Degrees of Freedom

Appendix Table 3g. Recreation Attribute: Frequency of Visit.

Visitation Pattern	1-3	4-7	8 or More	Combination	Row Total
Single Areas					
Observed frequency	42	5	4	0	51
Expected frequency	36.98	3.19	3.19	7.65	
Row percent	82.35	9.80	7.84	0.00	
Column percent	72.41	100.00	80.00	0.00	
Multiple Areas					
Observed frequency	16	0	1	12	29
Expected frequency	21.03	1.81	1.81	4.35	
Row percent	55.17	0.00	3.45	41.38	
Column percent	27.59	0.00	20.00	100.00	
Column Total	58	5	5	12	80

Chi-square (cal) = 26.40 with three Degrees of Freedom
Chi-square (.05) = 7.81 with three Degrees of Freedom

Appendix Table 3h. Recreation Attribute: Average Workweek of Head (Days).

Visitation Pattern	None	5 (With Days Off Together)	5 (With Days Off Separated)	6 Days	7 Days	Row Total
Single Areas						
Observed frequency	14	24	4	7	1	50
Expected frequency	10.76	27.85	2.53	6.96	1.90	
Row percent	28.00	48.00	8.00	14.00	2.00	
Column percent	82.35	54.55	100.00	63.64	33.33	
Multiple Areas						
Observed frequency	3	20	0	4	2	29
Expected frequency	6.24	16.15	1.47	4.04	1.10	
Row percent	10.34	68.97	0.00	13.79	6.90	
Column percent	17.65	45.45	0.00	36.36	66.67	
Column Total	17	44	4	11	3	79

Chi-square (cal) = 7.59 with four Degrees of Freedom
Chi-square (.05) = 9.49 with four Degrees of Freedom

Appendix Table 3i. Recreation Attribute: Education of Head.

Visitation Pattern	8 Years or Less	9-12 Years	13-16 Years	17 or More	Row Total
Single Areas					
Observed frequency	13	17	17	4	51
Expected frequency	8.93	19.76	19.13	3.19	
Row percent	25.49	33.33	33.33	7.84	
Column percent	92.86	54.85	56.67	80.00	
Multiple Areas					
Observed frequency	1	14	13	1	29
Expected frequency	5.08	11.24	10.88	1.81	
Row percent	3.45	48.28	44.83	3.45	
Column percent	7.14	45.16	43.33	20.00	
Column Total	14	31	30	5	80

Chi-square (cal) = 7.42 with three Degrees of Freedom
Chi-square (.05) = 7.81 with three Degrees of Freedom

Appendix Table 3j. Recreation Attribute: Most Important Factor in Area Choice.

Visitation Pattern	No Choice	Con-venience	Aes-thetics	Facil-ities	Cost	Travel Time	Roads	Other	Row Total
Single Areas									
Observed frequency	6	7	5	14	4	4	3	8	51
Expected frequency	0.00	5.63	4.38	13.75	3.75	7.50	2.50	7.50	
Row percent	0.00	15.56	11.11	31.11	8.89	8.89	6.67	17.78	
Column percent	0.00	77.78	71.43	63.64	66.67	33.33	75.00	66.67	
Multiple Areas									
Observed frequency	2	2	2	8	2	8	1	4	29
Expected frequency	0.00	3.38	2.63	8.25	2.25	4.50	1.50	4.50	
Row percent	0.00	7.41	7.41	29.63	7.41	29.63	3.70	14.81	
Column percent	0.00	22.22	28.57	36.36	33.33	66.67	25.00	33.33	
Column Total	8	9	7	22	6	12	4	12	80

Chi-square (cal) = 5.90 with six Degrees of Freedom
Chi-square (.05) = 12.59 with six Degrees of Freedom

Appendix Table 3k. Recreation Attribute: Favorite Activity of Household.

Visitation Pattern	No Choice	Swimming, Boating, Water-skiing	Fishing	Camping, Hiking, Nature Walks	Picnick-ing	Sight-seeing	Other (Urban)	Row Total
Single Areas								
Observed frequency	3	8	1	13	10	2	12	49
Expected frequency	0.00	8.82	3.78	12.60	6.93	1.26	12.60	
Row percent	0.00	17.39	2.17	28.26	21.74	4.35	26.09	
Column percent	0.00	57.14	16.67	65.00	90.91	100.00	60.00	
Multiple Areas								
Observed frequency	2	6	5	7	1	0	8	29
Expected frequency	0.00	5.18	2.22	7.40	4.07	.74	7.40	
Row percent	0.00	22.22	18.52	25.93	3.70	0.00	29.63	
Column percent	0.00	42.86	83.33	35.00	9.09	0.00	40.00	
Column Total	5	14	6	20	11	2	20	78

Chi-square (cal) = 10.70 with five Degrees of Freedom
Chi-square (.05) = 11.07 with five Degrees of Freedom

Appendix Table 3m. Recreation Attribute: Ownership of Recreation Equipment.

Visitation Pattern	No	Yes	Row Total
Single Areas			
Observed frequency	11	40	51
Expected frequency	8.29	42.71	
Row percent	21.57	78.43	
Column percent	84.62	59.70	
Multiple Areas			
Observed frequency	2	27	29
Expected frequency	4.71	24.29	
Row percent	6.90	93.10	
Column percent	15.38	40.30	
Column Total	13	67	80

Chi-square (cal) = 2.92 with one Degree of Freedom
Chi-square (.05) = 3.84 with one Degree of Freedom

Appendix Table 3n. Recreation Attribute: Activity Participation.

Visitation Pattern	Swimming, Boating, Water-skiing	Fishing, Boating	Camping, Hiking, Nature Walks	Picnicking	Sightseeing	Combination 1&2	1&4	2&3	2&4	4&5	3&4	Row Total
Single Areas												
Observed frequency	9	8	6	8	12	0	2	1	3	1	1	51
Expected frequency	7.65	7.65	3.63	5.10	7.65	5.10	2.55	5.10	3.19	1.91	1.28	
Row percent	17.65	15.69	11.76	15.69	23.53	0.00	3.92	1.96	5.88	1.96	1.96	
Column percent	75.00	66.67	100.00	100.00	100.00	0.00	50.00	12.50	60.00	33.33	50.00	
Multiple Areas												
Observed frequency	3	4	0	0	0	8	2	7	2	2	1	29
Expected frequency	4.35	4.35	2.18	2.90	4.35	2.90	1.45	2.90	1.81	1.09	.73	
Row percent	10.34	13.79	0.00	0.00	0.00	27.59	6.90	24.14	6.90	6.90	3.45	
Column percent	25.00	33.33	0.00	0.00	0.00	100.00	50.00	87.50	40.00	66.67	50.00	
Column Total	12	12	6	8	12	8	4	8	5	3	2	80

Chi-square (cal) = 40.37 with ten Degrees of Freedom
Chi-square (.05) = 18.31 with ten Degrees of Freedom

Appendix Table 4

Visits to Any Single Area
Compared to
Visits to Any Two Areas
Compared to
Visits to More Than Two Areas

Appendix Table 4a. Recreation Attribute: Income.

Visitation Pattern	Less Than $3,000	$3,000-$5,999	$6,000-$9,999	$10,000-$14,999	$15,000 and Over	Row Total
Single Area Visits						
Observed frequency	7	19	15	5	5	51
Expected frequency	3.96	14.51	18.03	8.79	5.72	
Row percent	13.73	37.25	29.41	9.80	9.80	
Column percent	77.78	57.58	36.59	25.00	38.46	
Any Pair of Visits						
Observed frequency	2	9	14	6	5	36
Expected frequency	2.79	10.24	12.72	6.21	4.03	
Row percent	5.56	25.00	38.89	16.67	13.89	
Column percent	22.22	27.27	34.15	30.00	38.46	
Multiple of Area Visits						
Observed frequency	0	5	12	9	3	29
Expected frequency	2.25	8.25	10.25	5.00	3.25	
Row percent	0.00	17.24	41.38	31.03	10.34	
Column percent	0.00	15.15	29.27	45.00	23.08	
Column Total	9	33	41	20	13	116

Chi-square (cal) = 13.75 with eight Degrees of Freedom
Chi-square (.05) = 15.51 with eight Degrees of Freedom

Appendix Table 4b. Recreation Attribute: Household Size.

Visitation Pattern	2 or Less	3-5	6 or More	Row Total
Single Area Visits				
Observed frequency	22	23	6	51
Expected frequency	16.85	24.83	9.31	
Row percent	43.14	45.10	11.76	
Column percent	57.89	41.07	28.57	
Any Pair of Visits				
Observed frequency	11	18	6	35
Expected frequency	11.57	17.04	6.39	
Row percent	31.43	51.43	17.14	
Column percent	28.95	32.14	28.57	
Multiple of Area Visits				
Observed frequency	5	15	9	29
Expected frequency	9.58	14.12	5.30	
Row percent	17.24	51.72	31.03	
Column percent	13.16	26.79	42.86	
Column Total	38	56	21	115

Chi-square (cal) = 7.83 with four Degrees of Freedom
Chi-square (.05) = 9.49 with four Degrees of Freedom

Appendix Table 4c. Recreation Attribute: Age of Household Head

Visitation Pattern	20 Years or Less	21-30 Years	31-40 Years	41-50 Years	51-60 Years	61 Years or More	Row Total
Single Area Visits							
Observed frequency	1	8	10	12	11	9	51
Expected frequency	1.32	8.35	13.19	12.31	8.35	7.47	
Row percent	1.96	15.69	19.61	23.53	21.57	17.65	
Column percent	33.33	42.11	33.33	42.86	57.89	52.94	
Any Pairs of Visits							
Observed frequency	2	6	12	6	4	6	36
Expected frequency	.93	5.90	9.31	8.69	5.90	5.28	
Row percent	5.56	16.67	33.33	16.67	11.11	16.67	
Column percent	66.67	31.58	40.00	21.43	21.05	35.29	
Multiple of Area Visits							
Observed frequency	0	5	8	10	4	2	29
Expected frequency	.75	4.75	7.50	7.00	4.75	4.25	
Row percent	0.00	17.24	27.59	34.48	13.79	6.90	
Column percent	0.00	26.32	26.67	35.71	21.05	11.76	
Column Total	3	19	30	28	19	17	116

Chi-square (cal) = 8.96 with ten Degrees of Freedom
Chi-square (.05) = 18.31 with ten Degrees of Freedom

Appendix Table 4d. Recreation Attribute: Number of Children.

Visitation Pattern	None	1-3	4 or More	Row Total
Single Area Visits				
Observed frequency	22	23	6	51
Expected frequency	17.74	24.39	8.87	
Row percent	43.14	45.10	11.76	
Column percent	55.00	41.82	30.00	
Any Pair of Visits				
Observed frequency	13	17	5	35
Expected frequency	12.17	16.74	6.09	
Row percent	37.14	48.57	14.29	
Column percent	32.50	30.91	25.00	
Multiple of Area Visits				
Observed frequency	5	15	9	29
Expected frequency	10.09	13.87	5.04	
Row percent	17.24	51.72	31.03	
Column percent	12.50	27.27	45.00	
Column Total	40	55	20	115

Chi-square (cal) = 8.05 with four Degrees of Freedom
Chi-square (.05) = 9.49 with four Degrees of Freedom

Appendix Table 4e. Recreation Attribute: Length of Stay.

Visitation Pattern	Hours	Days	Day and Night	Two Overnights	Three Overnights	Combination	Row Total
Single Area Visits							
Observed frequency	14	19	10	4	4	0	51
Expected frequency	9.23	12.75	8.79	1.76	2.64	15.83	
Row percent	27.45	37.25	19.61	7.84	7.84	0	
Column percent	66.67	65.52	50.00	100.00	66.67	0	
Any Pair of Visits							
Observed frequency	4	5	6	0	2	19	36
Expected frequency	6.52	9.00	6.21	1.24	1.86	11.17	
Row percent	11.11	13.89	16.67	0.00	5.56	52.78	
Column percent	19.05	17.24	30.00	0.00	33.33	52.78	
Multiple of Area Visits							
Observed frequency	3	5	4	0	0	17	29
Expected frequency	5.25	7.25	5.00	1.00	1.50	9.00	
Row percent	10.34	17.24	13.79	0.00	0.00	58.62	
Column percent	14.29	17.24	20.00	0.00	0.00	47.22	
Column Total	21	29	20	4	6	36	116

Chi-square (cal) = 46.04 with ten Degrees of Freedom
Chi-square (.05) = 18.31 with ten Degrees of Freedom

Appendix Table 4f. Recreation Attribute: Time of Visit.

Visitation Pattern	Weekday	Weekend	Vacation	Combination	Row Total
Single Area Visits					
Observed frequency	10	39	2	0	51
Expected frequency	5.77	36.81	1.33	7.10	
Row percent	19.61	76.47	3.92	0.00	
Column percent	76.92	46.99	66.67	0.00	
Any Pair of Visits					
Observed frequency	2	22	1	10	35
Expected frequency	3.96	25.26	.91	4.87	
Row percent	5.71	62.86	2.86	28.57	
Column percent	15.38	26.51	33.33	62.50	
Multiple of Area Visits					
Observed frequency	1	22	0	6	29
Expected frequency	3.28	20.93	.76	4.03	
Row percent	3.45	75.86	0.00	20.69	
Column percent	7.69	26.51	0.00	37.50	
Column Total	13	83	3	16	115

Chi-square (cal) = 20.83 with six Degrees of Freedom
Chi-square (.05) = 12.59 with six Degrees of Freedom

Appendix Table 4g. Recreation Attribute: Frequency of Visit.

Visitation Pattern	1-3	4-7	8 or More	Combination	Row Total
Single Area Visits					
Observed frequency	42	5	4	0	51
Expected frequency	38.25	2.20	2.64	7.91	
Row percent	82.35	9.80	7.84	0.00	
Column percent	48.28	100.00	66.67	0.00	
Any Pair of Visits					
Observed frequency	29	0	1	6	36
Expected frequency	27.00	1.55	1.86	5.59	
Row percent	80.56	0.00	2.78	16.67	
Column percent	33.33	0.00	16.67	33.33	
Multiple of Area Visits					
Observed frequency	16	0	1	12	29
Expected frequency	21.75	1.25	1.50	4.50	
Row percent	55.17	0.00	3.45	41.38	
Column percent	18.39	0.00	16.67	66.67	
Column Total	87	5	6	18	116

Chi-square (cal) = 30.12 with six Degrees of Freedom
Chi-square (.05) = 12.59 with six Degrees of Freedom

Appendix Table 4h. Recreation Attribute: Average Workweek of Head (Days).

Visitation Pattern	None	5 (With Days Off Together)	5 (With Days Off Separated)	6 Days	7 Days	Row Total
Single Area Visits						
Observed frequency	14	24	4	7	1	50
Expected frequency	9.13	29.13	3.48	6.09	2.17	
Row percent	28.00	48.00	8.00	14.00	2.00	
Column percent	66.67	35.82	50.00	50.00	20.00	
Any Pair of Visits						
Observed frequency	4	23	4	3	2	36
Expected frequency	6.57	20.97	2.50	4.38	1.57	
Row percent	11.11	63.89	11.11	8.33	5.56	
Column percent	19.05	34.33	50.00	21.43	40.00	
Multiple of Area Visits						
Observed frequency	3	20	0	4	2	29
Expected frequency	5.30	16.90	2.02	3.53	1.26	
Row percent	10.34	68.97	0.00	13.79	6.90	
Column percent	14.29	29.85	0.00	28.57	40.00	
Column Total	21	67	8	14	5	115

Chi-square (cal) = 11.08 with eight Degrees of Freedom
Chi-square (.05) = 15.51 with eight Degrees of Freedom

Appendix Table 4i. Recreation Attribute: Education of Head.

Visitation Pattern	8 Years or Less	9-12 Years	13-16 Years	7 or More	Row Total
Single Area Visits					
Observed frequency	13	17	17	4	51
Expected frequency	8.35	19.78	18.03	4.84	
Row percent	25.49	33.33	33.33	7.84	
Column percent	68.42	37.78	41.46	36.36	
Any Pair of Visits					
Observed frequency	5	14	11	6	36
Expected frequency	5.90	13.97	12.72	3.41	
Row percent	13.89	38.89	30.56	16.67	
Column percent	26.32	31.11	26.83	54.55	
Multiple of Area Visits					
Observed frequency	1	14	13	1	29
Expected frequency	4.75	11.25	10.25	2.75	
Row percent	3.45	48.28	44.83	3.45	
Column percent	5.26	31.11	31.71	9.09	
Column Total	19	45	41	11	116

Chi-square (cal) = 10.99 with six Degrees of Freedom
Chi-square (.05) = 12.59 with six Degrees of Freedom

Appendix Table 4j. Recreation Attribute: Most Important Factor in Area Choice.

Visitation Pattern	No Choice	Con-venience	Aes-thetics	Facil-ities	Cost	Travel Time	Roads	Other	Row Total
Single Area Visits									
Observed frequency	6	7	5	14	4	4	3	8	51
Expected frequency	0.00	5.42	5.42	11.67	3.33	8.33	3.75	7.08	
Row percent	0.00	15.56	11.11	31.11	8.89	8.89	6.67	17.78	
Column percent	0.00	53.85	38.46	50.00	50.00	20.00	33.33	47.06	
Any Pair of Visits									
Observed frequency	0.00	4	6	6	2	8	5	5	36
Expected frequency	0.00	4.33	4.33	9.33	2.67	6.67	3.00	5.67	
Row percent	0.00	11.11	16.67	16.67	5.56	22.22	13.89	13.89	
Column percent	0.00	30.77	46.15	21.43	25.00	40.00	55.56	29.41	
Multiple of Area Visits									
Observed frequency	2	2	2	8	2	8	1	4	29
Expected frequency	0.00	3.25	3.25	7.00	2.00	5.00	2.25	4.25	
Row percent	0.00	7.41	7.41	29.63	7.41	29.63	3.70	14.81	
Column percent	0.00	15.38	15.38	28.57	25.00	40.00	11.11	23.53	
Column Total	8	13	13	28	8	20	9	17	116

Chi-square (cal) = 10.39 with twelve Degrees of Freedom
Chi-square (.05) = 21.03 with twelve Degrees of Freedom

Appendix Table 4k. Recreation Attribute: Favorite Activity of Household.

Visitation Pattern	No Choice	Swimming, Boating, Water-skiing	Fishing	Camping, Hiking, Nature Walks	Picnicking	Sightseeing	Other (urban)	Row Total
Single Area Visits								
Observed frequency	3	8	1	13	10	2	12	49
Expected frequency	0.00	9.37	5.54	11.07	6.81	.85	12.35	
Row percent	0.00	17.39	2.17	28.26	21.74	4.35	26.09	
Column percent	0.00	36.36	7.69	50.00	62.50	100.00	41.38	
Any Pairs of Visits								
Observed frequency	1	8	7	6	5	0	9	36
Expected frequency	0.00	7.13	4.21	8.43	5.19	.65	9.40	
Row percent	0.00	22.86	20.00	17.14	14.29	0.00	25.71	
Column percent	0.00	36.36	53.85	23.08	31.25	0.00	31.03	
Multiple of Area Visits								
Observed frequency	2	6	5	7	1	0	8	29
Expected frequency	0.00	5.50	3.25	6.50	4.00	.50	7.25	
Row percent	0.00	22.22	18.52	25.93	3.70	0.00	29.63	
Column percent	0.00	27.27	38.46	26.92	6.25	0.00	27.59	
Column Total	6	22	13	26	16	2	29	114

Chi-square (cal) = 14.47 with ten Degrees of Freedom
Chi-square (.05) = 18.31 with ten Degrees of Freedom

Appendix Table 4m. Recreation Attribute: Ownership of Recreation Equipment.

Visitation Pattern	No	Yes	Row Total
Single Area Visits			
Observed frequency	11	40	51
Expected frequency	7.91	43.09	
Row percent	21.57	78.43	
Column percent	61.11	40.82	
Any Pair of Visits			
Observed frequency	5	31	36
Expected frequency	5.59	30.41	
Row percent	13.89	86.11	
Column percent	27.78	31.63	
Multiple of Area Visits			
Observed frequency	2	27	29
Expected frequency	4.50	24.50	
Row percent	6.90	93.10	
Column percent	11.11	27.55	
Column Total	18	98	116

Chi-square (cal) = 3.14 with two Degrees of Freedom
Chi-square (.05) = 5.99 with two Degrees of Freedom

Appendix Table 4n. Recreation Attribute: Activity Participation.

Visitation Pattern	Swimming, Boating, Water-Skiing	Fishing, Boating	Camping, Hiking, Nature Walks	Picnicking	Sightseeing	Combination 1&2	1&4	2&3	2&4	4&5	3&4	Row Total
Single Area Visits												
Observed frequency	9	8	6	8	12	0	2	1	3	1	1	51
Expected frequency	7.03	7.03	3.52	4.40	6.16	5.28	2.20	5.82	3.52	4.84	1.76	
Row percent	17.65	15.69	11.76	15.69	23.53	0.00	3.92	1.96	5.82	1.96	1.96	
Column percent	56.25	50.00	75.00	80.00	85.71	0.00	40.00	8.33	37.50	9.09	25.00	
Any Pair of Visits												
Observed frequency	4	4	2	2	2	4	1	4	3	8	2	36
Expected frequency	4.97	4.97	2.48	3.10	4.34	3.72	1.55	3.72	2.48	3.41	1.24	
Row percent	1.11	1.11	.55	.55	.55	1.11	.27	1.11	8.33	22.22	.55	
Column percent	25.00	25.00	25.00	20.00	14.28	33.33	20.00	33.33	37.50	72.73	50.00	
Multiple of Area Visits												
Observed frequency	3	4	0	0	0	8	2	7	2	2	1	29
Expected frequency	4.00	4.00	2.00	2.50	3.50	3.00	1.25	3.00	2.00	2.75	1.00	
Row percent	10.34	13.79	0.00	0.00	0.00	27.59	6.89	24.15	6.89	6.89	3.45	
Column percent	18.75	25.00	0.00	0.00	0.00	66.66	40.00	58.33	25.00	18.18	25.00	
Column Total	16	16	8	10	14	12	5	12	8	11	4	116

Chi-square (cal) = 56.40 with twenty Degrees of Freedom
Chi-square (.05) = 31.41 with twenty Degrees of Freedom

Appendix Table 5

Visits to the Local Lakes Area Only
Compared to
Visits to the Salt River Lakes Area Only
Compared to
Visits to the White Mountains Area Only

Appendix Table 5a. Recreation Attribute: Income.

Visitation Pattern	Less Than $3,000	$3,000-$5,999	$6,000-$9,999	$10,000-$14,999	$15,000 and Over	Row Total
Local Lakes Only						
Observed frequency	3	9	7	2	3	24
Expected frequency	3.06	9.70	6.13	2.55	2.55	
Row percent	12.50	37.50	29.17	8.33	12.50	
Column percent	50.00	47.37	58.33	40.00	60.00	
Salt River Lakes Only						
Observed frequency	2	6	1	1	1	11
Expected frequency	1.40	4.45	2.81	1.17	1.17	
Row percent	18.18	54.55	9.09	9.09	9.09	
Column percent	33.33	31.58	8.33	20.00	20.00	
White Mountains Only						
Observed frequency	1	4	4	2	1	12
Expected frequency	1.53	4.85	3.06	1.28	1.28	
Row percent	8.33	33.33	33.33	16.67	8.33	
Column percent	16.67	21.05	33.33	40.00	20.00	
Column Total	6	19	12	5	5	47

Chi-square (cal) = 3.47 with eight Degrees of Freedom
Chi-square (.05) = 15.01 with eight Degrees of Freedom

Appendix Table 5b. Recreation Attribute: Household Size.

Visitation Pattern	2 or Less	3-5	6 or More	Row Total
Local Lakes Only				
Observed frequency	6	14	4	24
Expected frequency	10.72	10.72	2.55	
Row percent	25.00	58.33	16.67	
Column percent	28.57	66.67	80.00	
Salt River Lakes Only				
Observed frequency	6	5	0	11
Expected frequency	4.91	4.91	1.17	
Row percent	54.55	45.45	0.00	
Column percent	28.57	23.81	0.00	
White Mountains Only				
Observed frequency	9	2	1	12
Expected frequency	5.36	5.36	1.28	
Row percent	75.00	16.67	8.33	
Column percent	42.86	9.52	20.00	
Column Total	21	21	5	47

Chi-square (cal) = 9.95 with four Degrees of Freedom
Chi-square (.05) = 9.49 with four Degrees of Freedom

Appendix Table 5c. Recreation Attribute: Age of Household Head.

Visitation Pattern	20 Years or Less	21-30 Years	31-40 Years	41-50 Years	51-60 Years	61 Years or More	Row Total
Local Lakes Only							
Observed frequency	0	3	8	6	4	3	24
Expected frequency	.51	4.09	5.11	4.09	5.62	4.60	
Row percent	0.00	12.50	33.33	25.00	16.67	12.50	
Column percent	0.00	37.50	80.00	75.00	36.36	33.33	
Salt River Lakes Only							
Observed frequency	1	4	0	0	3	3	11
Expected frequency	.23	1.87	2.34	1.87	2.57	2.11	
Row percent	9.09	36.36	0.00	0.00	27.27	27.27	
Column percent	100.00	50.00	0.00	0.00	27.27	33.33	
White Mountains Only							
Observed frequency	0	1	2	2	4	3	12
Expected frequency	.26	2.04	2.55	2.04	2.81	2.30	
Row percent	0.00	8.33	16.67	16.67	33.33	25.00	
Column percent	0.00	12.50	20.00	25.00	36.36	33.33	
Column Total	1	8	10	8	11	9	47

Chi-square (cal) = 15.57 with ten Degrees of Freedom
Chi-square (.05) = 18.37 with ten Degrees of Freedom

Appendix Table 5d. Recreation Attribute: Number of Children.

Visitation Pattern	None	1-3	4 or More	Row Total
Local Lakes Only				
Observed frequency	6	14	4	24
Expected frequency	10.72	10.72	2.55	
Row percent	25.00	58.33	16.67	
Column percent	28.57	66.67	80.00	
Salt River Lakes Only				
Observed frequency	6	5	0	11
Expected frequency	4.91	4.91	1.17	
Row percent	54.55	45.45	0.00	
Column percent	28.57	23.81	0.00	
White Mountains Only				
Observed frequency	9	2	1	12
Expected frequency	5.36	5.36	1.28	
Row percent	75.00	16.67	8.33	
Column percent	42.86	9.52	20.00	
Column Total	21	21	5	47

Chi-square (cal) = 9.95 with four Degrees of Freedom
Chi-square (.05) = 9.49 with four Degrees of Freedom

Appendix Table 5e. Recreation Attribute: Length of Stay.

Visitation Pattern	Hours	Days	Day and Night	Two Overnights	Three Overnights	Combination	Row Total
Local Lakes Only							
Observed frequency	6	12	4	1	1	0	24
Expected frequency	5.11	9.70	5.11	2.04	2.04	0.00	
Row percent	25.00	50.00	16.67	4.17	4.17	0.00	
Column percent	60.00	63.16	40.00	25.00	25.00	0.00	
Salt River Lakes Only							
Observed frequency	3	6	1	1	0	0	11
Expected frequency	2.34	4.45	2.34	.94	.94	0.00	
Row percent	27.27	54.55	9.09	9.09	0.00	0.00	
Column percent	30.00	31.58	10.00	25.00	0.00	0.00	
White Mountains Only							
Observed frequency	1	1	5	2	3	0	12
Expected frequency	2.55	4.85	2.55	1.02	1.02	0.00	
Row percent	8.33	8.33	41.67	16.67	25.00	0.00	
Column percent	10.00	5.26	50.00	50.00	75.00	0.00	
Column Total	10	19	10	4	4	0	47

Chi-square (cal) = 15.56 with ten Degrees of Freedom
Chi-square (.05) = 18.31 with ten Degrees of Freedom

Appendix Table 5f. Recreation Attribute: Time of Visit.

Visitation Pattern	Weekday	Weekend	Vacation	Combination	Row Total
Local Lakes Only					
Observed frequency	3	19	2	0	24
Expected frequency	5.11	17.87	1.02	0.00	
Row percent	12.50	79.17	8.33	0.00	
Column percent	30.00	54.29	100.00	0.00	
Salt River Lakes Only					
Observed frequency	2	9	0	0	11
Expected frequency	2.34	8.19	.47	0.00	
Row percent	18.18	81.82	0.00	0.00	
Column percent	20.00	25.71	0.00	0.00	
White Mountains Only					
Observed frequency	5	7	0	0	12
Expected frequency	2.55	8.94	.51	0.00	
Row percent	41.67	58.33	0.00	0.00	
Column percent	50.00	20.00	0.00	0.00	
Column Total	10	35	2	0	47

Chi-square (cal) = 5.75 with six Degrees of Freedom
Chi-square (.05) = 12.59 with six Degrees of Freedom

Appendix Table 5g. Recreation Attribute: Frequency of Visit.

Visitation Pattern	1-3	4-7	8 or more	Combination	Row Total
Local Lakes Only					
Observed frequency	21	1	2	0	24
Expected frequency	19.40	2.55	2.04	0.00	
Row percent	87.50	4.17	8.33	0.00	
Column percent	55.26	20.00	50.00	0.00	
Salt River Lakes Only					
Observed frequency	5	4	2	0	11
Expected frequency	8.89	1.17	.94	0.00	
Row percent	45.45	36.36	18.18	0.00	
Column percent	13.16	80.00	50.00	0.00	
White Mountains Only					
Observed frequency	12	0	0	0	12
Expected frequency	9.70	1.28	1.02	0.00	
Row percent	100.00	0.00	0.00	0.00	
Column percent	31.58	0.00	0.00	0.00	
Column Total	38	5	4	0	47

Chi-square (cal) = 13.68 with six Degrees of Freedom
Chi-square (.05) = 12.59 with six Degrees of Freedom

Appendix Table 5h. Recreation Attribute: Average Workweek of Head (Days).

Visitation Pattern	None	5 (With Days Off Together)	5 (With Days Off Separated)	6 Days	7 Days	Row Total
Local Lakes Only						
Observed frequency	7	10	3	3	0	23
Expected frequency	7.00	10.50	2.00	3.00	.50	
Row percent	30.43	43.48	13.04	13.04	0.00	
Column percent	50.00	47.62	75.00	50.00	0.00	
Salt River Lakes Only						
Observed frequency	3	6	1	1	0	11
Expected frequency	3.35	5.02	.96	1.43	.24	
Row percent	27.27	54.55	9.09	9.09	0.00	
Column percent	21.43	28.57	25.00	16.67	0.00	
White Mountains Only						
Observed frequency	4	5	0	2	1	12
Expected frequency	3.65	5.48	1.04	1.57	.26	
Row percent	33.33	41.67	0.00	16.67	8.33	
Column percent	28.57	23.81	0.00	33.33	100.00	
Column Total	14	21	4	6	1	46

Chi-square (cal) = 4.96 with eight Degrees of Freedom
Chi-square (.05) = 15.51 with eight Degrees of Freedom

Appendix Table 5i. Recreation Attribute: Education of Head.

Visitation Pattern	8 Years or Less	9-12 Years	13-16 Years	17 or More	Row Total
Local Lakes Only					
Observed frequency	6	9	7	2	24
Expected frequency	6.13	8.17	8.17	1.53	
Row percent	25.00	37.50	29.17	8.33	
Column percent	50.00	56.25	43.75	66.67	
Salt River Lakes Only					
Observed frequency	3	3	5	0	11
Expected frequency	2.81	3.74	3.74	.70	
Row percent	27.27	27.27	45.45	0.00	
Column percent	25.00	18.75	31.25	0.00	
White Mountains Only					
Observed frequency	3	4	4	1	12
Expected frequency	3.06	4.09	4.09	.77	
Row percent	25.00	33.33	33.33	8.33	
Column percent	25.00	25.00	25.00	33.33	
Column Total	12	16	16	3	47

Chi-square (cal) = 1.76 with six Degrees of Freedom
Chi-square (.05) = 12.59 with six Degrees of Freedom

Appendix Table 5j. Recreation Attribute: Most Important Factor in Area Choice.

Visitation Pattern	No Choice	Con-venience	Aes-thetics	Facil-ities	Cost	Travel Time	Roads	Other	Row Total
Local Lakes Only									
Observed frequency	3	6	2	6	2	0	2	3	24
Expected frequency	0.00	3.59	2.56	6.15	2.05	2.05	1.02	3.59	
Row percent	0.00	28.57	9.52	28.57	9.52	0.00	9.52	14.29	
Column percent	0.00	85.71	40.00	50.00	50.00	0.00	100.00	42.86	
Salt River Lakes Only									
Observed frequency	2	0	2	5	0	0	0	2	11
Expected frequency	0.00	1.54	1.10	2.63	.88	.88	.44	1.54	
Row percent	0.00	0.00	22.22	55.56	0.00	0.00	0.00	22.22	
Column percent	0.00	0.00	40.00	41.67	0.00	0.00	0.00	28.57	
White Mountains Only									
Observed frequency	1	1	1	1	2	4	0	2	12
Expected frequency	0.00	1.88	1.34	3.22	1.07	1.07	.54	1.88	
Row percent	0.00	9.09	9.09	9.09	18.18	36.36	0.00	18.18	
Column percent	0.00	14.29	20.00	8.33	50.00	100.00	0.00	28.57	
Column Total	6	7	5	12	4	4	2	7	47

Chi-square (cal) = 22.92 with twelve Degrees of Freedom
Chi-square (.05) = 21.03 with twelve Degrees of Freedom

Appendix Table 5k. Recreation Attribute: Favorite Activity of Household.

Visitation Pattern	No Choice	Swimming, Boating, Water-skiing	Fishing	Camping, Hiking, Nature Walks	Picnicking	Sightseeing	Other (Urban)	Row Total
Local Lakes Only								
Observed frequency	1	3	0	8	7	1	4	24
Expected frequency	0.00	3.14	.52	6.80	5.23	1.05	6.27	
Row percent	0.00	13.04	0.00	34.78	30.43	4.35	17.39	
Column percent	0.00	50.00	0.00	61.54	70.00	50.00	33.33	
Salt River Lakes Only								
Observed frequency	2	3	1	0	2	0	3	11
Expected frequency	0.00	1.23	.20	2.66	2.05	.41	2.45	
Row percent	0.00	33.33	11.11	0.00	22.22	0.00	33.33	
Column percent	0.00	50.00	100.00	0.00	20.00	0.00	25.00	
White Mountains Only								
Observed frequency	0	0	0	5	1	1	5	12
Expected frequency	0.00	1.64	.27	3.55	2.73	.55	3.27	
Row percent	0.00	0.00	0.00	41.67	8.33	8.33	41.67	
Column percent	0.00	0.00	0.00	38.46	10.00	50.00	41.67	
Column Total	3	6	1	13	10	2	12	47

Chi-square (cal) = 15.90 with ten Degrees of Freedom
Chi-square (.05) = 18.31 with ten Degrees of Freedom

Appendix Table 5m. Recreation Attribute: Ownership of Recreation Equipment.

Visitation Pattern	No	Yes	Row Total
Local Lakes Only			
Observed frequency	6	18	24
Expected frequency	4.60	19.40	
Row percent	25.00	75.00	
Column percent	66.67	47.37	
Salt River Lakes Only			
Observed frequency	2	9	11
Expected frequency	2.11	8.89	
Row percent	18.18	81.82	
Column percent	22.22	23.68	
White Mountains Only			
Observed frequency	1	11	12
Expected frequency	2.30	9.70	
Row percent	8.33	91.67	
Column percent	11.11	28.95	
Column Total	9	38	47

Chi-square (cal) = 1.44 with two Degrees of Freedom
Chi-square (.05) = 5.99 with two Degrees of Freedom

Appendix Table 5n. Recreation Attribute: Activity Participation.

Visitation Pattern	Swimming, Boating, Water-skiing	Fishing, Boating	Camping, Hiking, Nature Walks	Picnicking	Sightseeing	Combination 1&2	1&4	2&3	2&4	4&5	3&4	Row Total
Local Lakes Only												
Observed frequency	2	5	4	6	3	0	0	1	1	1	1	24
Expected frequency	4.60	4.09	3.06	4.09	4.09	0	1.02	.51	1.53	.51	.51	
Row percent	8.33	20.83	16.66	25.00	12.50	0.00	0.00	4.16	4.16	4.16	4.16	
Column percent	22.22	62.50	66.66	75.00	37.50	0.00	0.00	100.00	33.33	100.00	100.00	
Salt River Lakes Only												
Observed frequency	5	2	0	2	0	0	2	0	0	0	0	11
Expected frequency	2.11	1.87	1.40	1.87	1.87	0	.47	.23	.70	.23	.23	
Row percent	45.45	18.18	0.00	18.18	0.00	0.00	18.18	0.00	0.00	0.00	0.00	
Column percent	55.55	25.00	0.00	25.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	
White Mountains Only												
Observed frequency	2	1	2	0	5	0	0	0	2	0	0	12
Expected frequency	2.29	2.04	1.53	2.04	2.04	0	.51	.26	.77	.26	.26	
Row percent	16.66	8.33	16.66	0.00	41.66	0.00	0.00	0.00	16.66	0.00	0.00	
Column percent	22.22	12.50	33.33	0.00	62.50	0.00	0.00	0.00	66.66	0.00	0.00	
Column Total	9	8	6	8	8	0	2	1	3	1	1	47

Chi-square (cal) = 26.42 with twenty Degrees of Freedom
Chi-square (.05) = 31.41 with twenty Degrees of Freedom

LIST OF REFERENCES

CARTER, W. HARRISON and WILLIAM SNAVELY. (1961) Inter-mediate Economics Analysis, McGraw-Hill Book Company, Inc., New York, pp. 55-56.

CLAWSON, MARION and JACK T. KNETSCH. (1966) Economics of Outdoor Recreation, John Hopkins Press, Baltimore, pp. 33-52.

COCHRAN, WILLIAM G. (1964) Sampling Techniques, Second Edition, John Wiley & Sons, New York, pp. 74-75.

DIRECTORY OF HOUSEHOLDERS, INCLUDING STREET AND AVENUE GUIDE. (1966) Section III. R. L. Polk and Company, Dallas, Texas.

FERBER, ROBERT and P. J. VERDOON. (1962) Research Methods in Economics and Business, MacMillan Company, New York.

POLK'S TUCSON CITY DIRECTORY. (1966) R. L. Polk and Company, Dallas, Texas.

POPULATION STUDY TUCSON STANDARD METROPOLITAN STATISTICAL AREA, 1966. (1966) Tucson-Pima County, City-County Planning Departments.

SCOTT, ANTHONY. (1965) "The Valuation of Game Resources: Some Theoretical Aspects," Canadian Fisheries Reports, No. 4, pp. 27-47.

SIEGEL, SIDNEY. (1956) Non-Parametric Statistics for Behavioral Sciences, McGraw-Hill Book Company, Inc., New York, pp. 104-174.

UNITED STATES DEPARTMENT OF COMMERCE, BUREAU OF THE CENSUS. (1961) United States Census of Population 1960, Arizona, General Social and Economic Characteristics, Washington, D. C.

UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF OUTDOOR RECREATION. (1967) Outdoor Recreation Trends, Washington, D. C.

UNITED STATES DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY. (1962) Outdoor Recreation Resources Review Commission Report 19 and 24, Washington, D. C., p. 6.