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ABSTRACT

TOWARD THE MEASUREMENT OF DEMAND FOR OUTDOOR RECREATION IN THE PHILADELPHIA-BALTIMORE-WASHINGTON METROPOLITAN REGION WITH IMPLICATIONS FOR AGRICULTURAL RESOURCE USE

by

Gerald Leon Cole

The outdoor recreation industry constitutes an important segment of the United States economy; 1962 expenditures are estimated at $20 billion. Various reasons are cited for a growing demand, including increasing population, greater urbanization, higher real incomes and greater mobility.

The U. S. Department of Agriculture exercises the Federal responsibility for directing the use of appropriate rural resources into outdoor recreation facilities where feasible. This study provides guidelines both to the U. S. Department of Agriculture and to rural landowners. It is based upon 1963-64 household participation rates for individual activities in the Philadelphia-Baltimore-Washington Metropolitan Region. Participation data reflect 1,718 households based on a quota sample of 2,000 households in the region.

Multiple regression analysis relates participation in individual activities to socio-economic characteristics of the respondents, the distance traveled to participate, the time required and admission fees charged where applicable. The following activities are included: pleasure rides, picnicking,

walking, swimming, boating, camping, fishing, hunting, golfing, horseback riding, ice skating, snow skiing, tobogganing and vacation and weekend trips.

In general, R^2 values for individual activities were less than .50, possibly due to such problems as specification errors and errors in measurement.

For all activities a statistically significant relationship appeared between participation and the distance traveled to participate and the time required for the travel. A positive relationship existed between participation and distance and time for pleasure rides, ocean swimming, bay swimming, boating and camping. This probably occurred because most participants were clustered in three urban centers while the resource-based areas for participation were located along the Atlantic Coast, involving travel distances of over 50 miles. For the remaining activities of a user-oriented nature, necessitating travel of less than 50 miles, there was a negative relationship between participation and distance traveled.

Among the socio-economic variables, increasing age reduced participation in swimming, pleasure rides, picnicking and hunting. Participation in rides, picnicking, fishing, golfing and hunting increased with the level of education. As income increased, participation increased for rides, ocean and pool swimming, walks, boating, golfing, horseback riding, ice skating, tobogganing, skiing and vacation and weekend trips. Participation in picnicking, fishing,

bay swimming and camping decreased as income increased. Non-whites participated less than whites in swimming, golfing and ice skating. Participation in boating and hunting was more frequent among blue collar workers than among professional persons.

Projected participation rates indicate that pleasure rides, walking and swimming will account for 80 percent of all user days in 1970 and 1980, with boating, camping and ice skating among the fastest growing activities.

The results indicated that a pent-up demand exists for municipal parklands, swimming pools, beachlands and golf courses at current market prices, due to the lack of convenient facilities.

Based on current participation rates and projected increases, farmers and other rural landowners located near the Atlantic Coast should investigate the potential for marinas and campgrounds. Landowners who reside near urban centers should consider swimming facilities (pools or ponds), golf courses and horseback riding facilities. Farmers within one to two hours driving time of the cities should consider leasing or renting hunting rights on their farms.

The study approach used and the resulting participation data do not generate statistical demand functions for individual recreation activities; quantity-price relationships were not obtainable. The participation data do not fully indicate the demand that exists at present market prices because persons who reside outside of the sample area are excluded as are those persons who are prevented from participating by the lack of a facility.

TOWARD THE MEASUREMENT OF DEMAND FOR OUTDOOR RECREATION IN THE PHILADELPHIA-BALTIMORE-WASHINGTON METROPOLITAN REGION WITH IMPLICATIONS FOR AGRICULTURAL RESOURCE USE

by

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CHAPTER I

INTRODUCTION

Background

The outdoor recreation industry has become an important segment of the United States economy. The Outdoor Recreation Resources Review Commission estimated that 1962 expenditures for outdoor recreation totaled $20 billion.[1/] Clawson and others have stated that the demand for outdoor recreation goods and services is growing at approximately 10 percent per year. Reasons cited for the increasing demand include: (1) increasing population, (2) increasing urbanization, (3) increasing consumers' real incomes, (4) increasing leisure time, and (5) increasing mobility.[2/]

A growing industry within an economy usually means expanding business opportunities in that industry, which in turn offers the possibility of additional jobs.

Congress recognized the increasing importance of outdoor recreation in 1958. With the passage of Public Law 85-470, the Outdoor Recreation Resources Review Commission was established.[3/]

1/ Outdoor Recreation Resources Review Commission, Outdoor Recreation for America, U. S. Government Printing Office, Washington, 1962, p. 24.

2/ Clawson, Marion, Methods of Measuring the Demand for and Value of Outdoor Recreation, Washington, Resources for the Future, Inc. Reprint No. 10, February 1959, p. 1.

3/ Outdoor Recreation Resources Review Commission, Outdoor Recreation for America, op. cit., p. 1.

The bipartisan agency was charged with the responsibility of inventorying and evaluating the nation's outdoor recreation resources and opportunities and insuring that present and future generations of Americans will have access to an adequate supply of the facilities desired.

Upon completion of its initial mission, with the publishing of 27 volumes, the Outdoor Recreation Resources Review Commission recommended that a Bureau of Outdoor Recreation be established in the Department of the Interior. This bureau has the overall responsibility for leadership of a nationwide effort by coordinating various Federal programs and assisting other levels of government in meeting the needs for outdoor recreation.[4/]

An additional recommendation of the Outdoor Recreation Resources Review Commission was that a Recreation Advisory Council be established on a continuing basis. The Advisory Council consists of the Secretaries of Interior, Agriculture and Defense with other agencies participating on an ad hoc basis.[5/]

The United States Department of Agriculture has the responsibility to assist in the development of agriculture's resources for recreation where feasible. The Food and Agricultural Act of 1962 authorized assistance to private, rural landowners in the

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4/ Ibid, p. 9.

5/ Ibid, p. 10.

planning, design and establishment of outdoor recreation facilities.[6/] Action agencies within the Department of Agriculture have been charged with specific responsibilities in implementing the program. The Soil Conservation Service has been designated as the chief planning agency. The Farmers' Home Administration and the Federal Land Bank Association are authorized to make loans in certain instances for facilities which have been planned by the Soil Conservation Service. The Agricultural Conservation and Stabilization Service is authorized to make payments to farm owners to phase land out of agriculture and into recreational use.

In addition, current emphasis by President and Mrs. Johnson on national beauty involves the wise use of our national resources to enhance their value in recreational enterprises.

Although much has been written about the general increase in demand for outdoor recreation facilities, little specific information exists about the extent of increased demand and preferences for facilities in the Washington-Baltimore-Philadelphia Metropolitan Region. Such information is essential if private enterprises and public planners are to allocate resources to the outdoor recreation sector of the economy in the most efficient manner. Information on demand may indicate opportunities for farm people to improve their incomes by entering the outdoor recreation business.

6/ Public Law 87-703, 87th Congress, H.R. 12391, Food and Agriculture Act of 1962, U. S. Government Printing Office, Washington, September 27, 1962, pp. 1-2.

Objectives

The objectives of this study are oriented towards providing information which may be helpful in determining the demand for outdoor recreation facilities in the region and aid in the planning for needed facilities. The first objective is to estimate the demand for outdoor recreation facilities by consumers living in the Philadelphia-Baltimore-Washington Metropolitan Region.

The second objective of the study is to estimate the market potential in recreation for agriculture's natural and human resources as evidenced by the demand for outdoor recreation facilities in the region. There may be opportunities for farmers to shift their available resources from agriculture to outdoor recreation as the sole source of income. In other instances, outdoor recreation activities may provide a supplemental source of income through better use of resources. Examples of such resources are lands in permanent pastures or woods, and ponds or other bodies of water that could be converted into income producing enterprises.

The third objective is to provide criteria to aid public administrators and private enterprises in making decisions concerning the establishment of outdoor recreation facilities on farms in the region. Specific types of facilities which are most likely to face an expanding demand or to be in short supply and are adaptable to farmer investment will be evaluated.

Plan for the Dissertation

The following chapter will review the theoretical literature and discuss those empirical studies which have relevance to this study. Chapter III will outline the methodology of the study. The characteristics of the sample area and the technique for drawing the sample will be discussed. Design of the questionnaire and methods of statistical analysis are also considered. Chapter IV will present the results of the statistical analysis. Consumer preferences for specific outdoor recreation activities will be analyzed. Macro implications of overall participation rates will be discussed in connection with projections of future participation rates. Chapter V will present policy implications for the use of private and public resources to provide for future outdoor recreation requirements in the study region. Chapter VI will indicate some of the limitations of the study approach used and outline suggestions for needed research. Chapter VII will conclude the study with a summary and conclusions based on the research findings.

CHAPTER II

REVIEW OF LITERATURE

A study of consumer behavior attempts to isolate those variables which help to explain consumer demand for goods and services. This study is particularly concerned with those variables affecting the demand for outdoor recreation goods and services.

Economists often consider non-monetary variables as a group under a heading called consumer "tastes" in static economic theory. In this study the assumption of constant tastes will be relaxed in order to determine the influence of such factors as age, occupation, education, race, etc. on participation in outdoor recreation activities.

Over the years, economists have developed a number of theories as to why consumers demand particular goods and services. Marginal utility theory led to the Marshallian theory of demand which Hicks summarized as follows:

> "A consumer with a given money income is confronted with a market for consumption goods, on which the prices of those goods are already determined; the question is, how will he divide his expenditures among the different goods. It is assumed that the consumer derives from the goods he purchases so much utility, the amount of utility being a function of quantity of goods acquired, and that he will spend his income in such a way as to bring the maximum possible amount of utility. But utility will be maximized when the marginal unit of expenditure in each direction brings in the same increment of utility. For if this is so, a transference of expenditure from one direction to another will involve a greater loss of utility in the direction where expenditure is reduced than will be compensated by the gain in utility in the direction where expenditure is increased

> (from the principle of diminishing marginal utility). Total utility must therefore be diminished whatever transfer is made. Since, with small units, the difference between the marginal utilities of two successive units of a commodity may be neglected, we can express the conclusion in another way: the marginal utilities of the various commodities bought must be proportional to their prices." 1/

The concept of utility maximization as summarized by Hicks from Marshallian theory assumes a cardinal measurement of utility. A concept later refined by Pareto from earlier work by Edgeworth assumes ordinal measurement of utility. Pareto made the indifference curve a part of standard economics. The indifference curve approach deals with the problem of related goods, both complementary and competitive. By comparing all possible combinations for the consumption of two commodities an ordered scale of preferences may be derived, based on the assumption that consumers always prefer more of any single good or combination of goods to less of the same. Likewise, in this analysis, certain combinations of two goods (X and Y) may be found which yield the same total utility for a given consumer. It may be stated that the consumer is indifferent towards any of these combinations which establish the boundary for a particular indifference curve.2/

Indifference curves slope downward and to the right as long as each good consumed has a positive marginal utility. For if

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1/ Hicks, John R., Value and Capital, Clarendon Press, Oxford, 1946, pp. 11-12.

2/ Ibid, pp. 12-13.

a given quantity of X is consumed and the consumption of Y is increased, total utility must increase thereby placing the consumer on a higher indifference curve. Likewise, if a given quantity of Y is consumed and the consumption of X increases, the consumer also reaches a higher indifference curve.[3/] This study will consider consumer's preferences for outdoor recreation activities by measuring participation in the various activities.

The functioning of Engel's law is likely to be a contributing factor to the increasing demand for outdoor recreation activities. The law states that as real disposable incomes increase, consumers tend to spend a smaller portion of their income on food and housing and an increasing percentage of their income on such goods and services as clothing, medical care and recreation. Houthakker's study, using 1950 data, illustrates this phenomenon by comparing income elasticities for groups of goods and services purchased by consumers. For U. S. consumers, food had an income elasticity of .642, housing .731, clothing 1.336, and other expenditures of which recreation is a part, 1.222. The geometric mean for 1950 expenditures was $3,290. A one percent increase in income would result in an increase of 1.2 percent on miscellaneous expenditures including recreation, using the above elasticity coefficient.[4/]

3/ Ibid, pp. 13-14.

4/ Houthakker, H. S., "An International Comparison of Household Expenditure Patterns Commemorating the Cenentary of Engel's Law," Econometrica, 25, Oct. 1957, pp. 546-549.

In the 1950 study, food accounted for 31 percent of total expenditures, housing 16 percent, clothing 11 percent, and miscellaneous 42 percent. According to the latest available information, food accounted for only 18.4 percent of total expenditures in 1965.[5/]

Demand for outdoor recreation activities depends in part on the consumer's availability of leisure time. Some clarification is needed on the definition of leisure and leisure time. De Grazia, in his book Of Time, Work and Leisure, argues that leisure is not compatible with a democratic society. According to De Grazia, "leisure is the state of being free of everyday necessity".[6/] Thus, leisure by this definition belongs to such groups as the landed aristocracy. Leisure remains unaffected by either work or recreation. De Grazia defines recreation as "activity that rests men from work, often by giving them a change (distraction, diversion) and restores (re-creates) them for work".[7/] He considers much of the time outside of work hours and those hours necessary for subsistence and body maintenance as free time. The above definition of leisure appears to be the most restrictive and non-pragmatic among those found in the literature.

5/ U. S. Department of Agriculture, Handbook of Agricultural Charts 1965, U. S. Government Printing Office, Washington, 1965, p. 17.

6/ De Grazia, Sebestian, Of Time, Work and Leisure, The Twentieth Century Fund, New York, 1962, pp. 246-247.

7/ Ibid.

Clawson defines leisure as "all time beyond the existence and subsistence time".[8/] Under existence time he includes eating, sleeping and time for personal hygiene. Subsistence time includes the time spent working at a job or jobs. Essentially, then, leisure is that time available for chosen activities by an individual or a society. However, Clawson expresses the opinion that leisure does not connotate idleness. He puts forth the hypothesis that certain people in a society may be idle because they lack income, ideas, the opportunity or the energy to do something with their free time. Clawson's definition of leisure is more workable than De Grazia's. These two definitions represent divergent viewpoints on the concept of leisure.[9/]

Other persons may be faced by heavy demands on their leisure time due to many alternative and pressing activities. Using Clawson's definition then, leisure time is available in the American society, but is not attainable by everyone due to the limitations noted.

No data are available solely of the sample area to indicate the amount of leisure time available now or in the future. However, the current amount of leisure time available in the U. S.

8/ Clawson, Marion, How Much Leisure Now and in the Future?, Resources for the Future, Inc., Reprint No. 45, Washington, 1964, p. 1.

9/ The two works cited above are illustrative of the volume of material which has been written on leisure. For a comprehensive sociological treatment of the subject see Larrabee, Eric and Rolf Meyersohn, Mass Leisure, The Free Press, New York, 1958.

and projections for the future have been made. The annual National Time Budget in the year 2000 is projected at 2,907 billion hours. Of this total, 1,113 billion hours are expected to be available for leisure time activities. This is an increase of two and one-half times over the leisure hours available to Americans in 1950.[10/]

Equally as significant as the increase in total leisure time is the change in composition of leisure time available. Due to an increased life expectency among Americans, retired leisure has increased most significantly since 1900. An aggregate four-fold increase occurred between 1900 and 1950, with an additional doubling of aggregate leisure time expected by the year 2000. Vacation leisure time increased by 100 percent between 1900 and 1950 and is expected to increase an additional five times by 2000.[11/] As technology has changed and population has increased, the work week has been shortened and is expected to continue this trend, Table 1. In 1850, the average work week was 69.8 hours; in 1900, 60.2 hours; in 1950, 41.7 hours; and is expected to be 30.5 hours in the year 2000. As a consequence, both weekend leisure time and daily leisure time are likely to increase.

The various socioeconomic groups within the total population will not receive the same impact as a result of the trends. Persons who are poorly educated will less likely be able to afford

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10/ Clawson, How Much Leisure, op. cit., pp. 10-12.

11/ Ibid, p. 13.

Table 1. Average weekly hours of work for the U. S. labor force for selected years, 1850-1959, with projections to 2000[a]

Year	Average weekly hours	
	BLS	Computed[b]
1850	69.8	--
1900	60.2	--
1930	45.9	47.6
1940	44.0	43.8
1950	41.7	41.0
1955-57	41.4	40.1
1959	40.5	39.5
1976	--	36.6
2000	--	30.5

a/ Outdoor Recreation Resources Review Commission, Projections to the Years 1976 and 2000: Economic Growth, Population, Labor Force and Leisure, and Transportation, Study Report No. 23, U. S. Government Printing Office, Washington, 1962, p. 181.

leisure time activities than will more highly educated groups. Likewise, persons displaced by technological change could fall in the same category. At the other end of the scale, managerial and professional people may be hard pressed to meet the demands on their time. Thus, little time would remain for leisure activities in the outdoors. Therefore, the aggregate National Time Budget bypasses trends of specific groups within the population. However, it does serve as an indication of the magnitude of the leisure time available. It remains for the planners of public and private services to investigate the available market of the segment of the population intended to be served by particular facilities.

Within Clawson's framework, recreation is one activity chosen by individuals who have leisure time available to them. Using the earlier assumptions about a rational consumer, we will assume that he maximizes his satisfaction from his available leisure time subject to the income constraint. Thus, the marginal utility per dollar spent on recreational goods and services as well as other leisure time activities is equated with all other goods and services in the bundle.

We will further assume that the consumer chooses between leisure and work or between leisure and income by a conscious and rational procedure. Boulding presents an analysis relevent to this discussion.[12/] Using indifference curves he illustrates how a

12/ Boulding, Kenneth E., Economic Analysis, Third Edition, Harper and Brothers, New York, 1955, pp. 797-801.

consumer chooses between the number of hours of work per day and income per day depending on the wage rate offered to the individual. The indifference curves between income and work slope upward and to the right since it is assumed that work has disutility. The indifference curves get progressively steeper as the hours of work increase and as the physical limitations of the individual are reached. Wage lines, drawn through the origin, are increasingly steeper as the wage rate increases. Tangency points between wage lines and indifference curves indicate the number of hours per day that an individual will work at alternative wage rates. Transferring these tangency points to another graph with the hours of work per day on the horizontal axis and the hourly wage rate on the vertical axis allows the derivation of the supply curve for labor. The labor supply curve is backward bending after some maximum number of hours is reached. Past this point leisure is preferred to work and corresponding additional income. Following Boulding's reasoning, the value of the consumer's leisure time would be as great or greater than the wage he would be paid for working.

Early economists took note of the possible future needs for recreational facilities such as parklands near urban areas. Alfred Marshall wrote as follows:[13/]

13/ Marshall, Alfred, Principles of Economics, Eighty Edition, Macmillan and Company, London, 1949, pp. 167, 547-548.

> "There is no better use for public and private money than in providing public parks and playgrounds in large cities ... The want of air and light, or peaceful repose out-of-doors for all ages and of healthy play for children, exhausts the energies of the best blood of England ... By allowing vacant spaces to be built on recklessly ... We are sacrificing those ends toward which material wealth is only a means."

John Stuart Mill in his Principles of Political Economy cautioned against the failure to provide open spaces.[14/]

> "A population may be too crowded though all be amply supplied with food and raiment ... Solitude ... is essential ... nor is there much satisfaction in contemplating the world with nothing left to the spontaneous activity of nature; with every rood of land brought into cultivation ... and scarcely a place left where a wild shrub or flower could grow."

Wehrwein and Parsons anticipated many of the potential benefits associated with the outdoor recreation industry in 1932.[15/] A study was conducted in a marginal agricultural area in Northern Wisconsin. A complementary relationship was found between the agricultural sector and the recreation industry. Farmers could obtain part-time employment in the resorts in the area during the summer and during the remainder of the year in constructing and repairing resort facilities. During the summer months, tourists in the area increased the demand for agricultural commodities, especially for fruits, vegetables, poultry and dairy products.

14/ Mill, John Stuart, Principles of Political Economy, Peoples Edition, Longmans, Green, Reader and Dyer, London, 1871, p. 454.

15/ Wehrwein, George S., and Kenneth H. Parsons, Recreation As a Land Use, Wisconsin Agricultural Experiment Station Bulletin 422, Madison, 1932.

An additional impact on the local economy was generated through the purchase of sub-marginal farm land and forest lands by non-residents for hunting, fishing and the building of vacation cabins. The net result was to add to the tax base of the local government. However, where lands were subdivided, additional services were often required; namely, water and sewage systems. In addition, some of the lands were subdivided prematurely where demand for such facilities did not exist, leading to excessive social costs. Similar problems exist at the present time and pinpoint the need for estimating the demand for particular recreation facilities before allocating resources to their development.

Renne, in 1947, recognized the growing demand for outdoor recreation in a post World War II economy in light of the increasing urbanization that was taking place.[16/] However, he was careful to point out that the heaviest demand was likely to occur near the most densely populated urban centers for both private and public facilities. He concluded that seacoasts and other beaches were likely to experience the heaviest demand and could withstand intensive use. Over one-half of the U. S. population at that time lived within 55 miles of the seacoasts and the Great Lakes. Renne also argued that public ownership of recreational lands in some instances and regulation of private facilities in other cases may be desirable to enhance the general welfare of society.

16/ Renne, Roland R., Land Economics, Harper and Brothers, New York, 1947, pp. 300-309.

Barlowe discussed the problem of providing land to meet future recreational needs in light of changing consumer tastes and preferences.[17/] Any per capita estimates of recreational land use are influenced by those persons who prefer to spend their leisure time in their own homes, in night clubs, in theaters, etc. Per capita land use requirements for these persons are very low. Other persons make use of parks, golf courses, beaches, etc. For this category, land requirements are larger but the land is usually intensively used and of high value. At the opposite extreme are those persons who prefer wilderness areas for camping, fishing, hiking, etc. which involves extensive use of land.

Any plans of future land requirements must take the above categories into account. Trends in preferences obviously would be useful to planners. Certainly the fact that U. S. population is becoming urbanized will influence the land requirements and the location of these facilities. Of course, the location of recreation facilities is tempered by the transportation system available in the area. Future planning based on past population characteristics may fail to take into account increasing real family incomes and a shorter work week.

Barlowe recommends that between five and ten percent of the land in metropolitan areas be reserved for recreational uses.[18/]

17/ Barlowe, Raleigh, Land Resource Economics, Prentice-Hall, Inc. Englewood Cliffs, N. J., 1958, pp. 97-100.

18/ Ibid.

He recognizes, however, that as land becomes relatively more scarce and other uses compete more strongly in the market place, this figure may be adjusted downwards. Other areas should be reserved in the more rural areas for picnicking, boating, camping, hunting, fishing, hiking, etc.

Marion Clawson of Resources For The Future has contributed much to the literature on outdoor recreation in recent years. He classifies outdoor recreation areas into three broad categories.[19/] These are: user oriented, resource based and intermediate. An examination of these types may help to plan for future demand.

User oriented facilities are those very close to the user on whatever resources are available. Examples include golf courses, playgrounds, swimming pools, tennis courts, riding trails, etc. These are often located within a municipality, and owned by the local government or private individuals. Use largely occurs after school or work hours.

Resource based facilities, as the name implies, are located wherever outstanding resources can be found, often at considerable distance from the users. These include major sightseeing attractions, facilities of unusual, scientific or historical interest; wilderness, camping areas, hiking and mountain climbing trails, etc. These facilities often cover thousands of acres and take the

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19/ Clawson, Marion, R. Burnell Held and Charles H. Stoddard, Land for the Future, Resources For The Future, Inc., Johns Hopkins Press, Baltimore, 1960, pp. 1-36.

form of national or state forests, state parks or sometimes private enterprises near seashores or major lakes. Heaviest use of the facilities occurs during vacation periods or possibly on weekends.

The intermediate facilities are oriented, with the participants in mind, on the best resources available within two to three hours driving distance of large urban areas. The facilities may be equipped for camping, picnicking, hunting, fishing, hiking or swimming on a hundred to several thousand acres. State parks or private areas may be provided.

Delaware's proximity to three metropolitan areas (Washington, Baltimore and Philadelphia) would suggest that many recreation participants would use the beaches and other public and/or private facilities in the intermediate and resource based categories. That is, Delaware is close enough for one day and weekend outings, but the seashore also will likely be an attractant for vacationers.

Clawson also has pioneered much of the theoretical work concerning the demand for outdoor recreation. In a 1959 paper he presented techniques for measuring the demand for a given recreational site such as a national or state park.[20/] The technique is oriented around the concept of the total recreational experience and the recreational opportunity. Clawson assumes that most recreational experiences are planned for and shared by the

20/ Clawson, Marion, Methods of Measuring the Demand for and Value of Outdoor Recreation, Resources For The Future, Inc., Reprint No. 10, Washington, 1959, pp. 1-36.

family as a group. Thus, a trip to a national park would be planned by the family. However, each family member might not engage in the same recreational activities while in the park. He utilized visitation data from Yosemite National Park to illustrate the concept. Visits were separated by point of origin of the visitors and divided into distance zones according to the one way mileage from the park. California visitors were kept separate from out-of-state visitors. In addition, the number of visitors from each distance zone was divided by the total population in each zone to get a proportion attending from each area. The estimated cost per visit was calculated at $9.00 per day plus 10 cents per mile for a car divided by four (assumed four passengers per car). Despite rather imperfect data and the necessity of some rather heroic assumptions concerning travel costs, demand curves were approximated for California visitors and out-of-state visitors. The curve for California visitors was more price-elastic than the curve for out-of-state visitors suggesting the availability of more substitutes to local residents for the attractions offered in Yosemite than for visitors who came a much greater distance.

L. J. Lerner, in a 1962 study, used a modification of the Clawson demand model to estimate the recreational benefits obtained by participants at a California reservoir.[21/] His analysis was

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21/ Lerner, Lionel J., "Quantitative Indices of Recreational Values", Conference Proceedings of the Committee on The Economics of Water Resources Development, Report No. 11, Economics in Outdoor Recreation Policy, University of Nevada, Reno, August 6-8, 1962, pp. 55-80.

based on the number of visitor days per 100,000 of population correlated with the distance travelled to the reservoir site. Distances were divided into zones as Clawson had done. Again, the value of the recreational opportunity to the consumer is equal to the costs of travelling to the site plus any entrance fees. The elasticity of the demand schedule resulting from the analysis was similar to Clawson's findings. The curve was more price elastic for visitors who lived relatively close to the site and more inelastic for the persons travelling greater distances.

In 1964, Knetsch utilized the Clawson model to estimate a demand curve for persons visiting Kerr Reservoir.[22/] He used cost per mile for travel to the site as an indicator of price paid. Knetsch also found that the resulting demand curve was quite highly elastic for visitors within close proximity to the reservoir, and inelastic for visitors who came greater distances. Using the integral of the input demand curve, Knetsch concluded that the yearly recreational benefits for Kerr Reservoir were about $1.6 million.

Brown presented a paper in 1964 in which he estimated the value of the salmon-steelhead sport fishery in Oregon.[23/] He used

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22/ Knetsch, Jack L., "Economics of Including Recreation as a Purpose of Water Resources Projects", Journal of Farm Economics, 46:5, December 1964, pp. 1148-1157.

23/ Brown, William G., "Measuring Recreational Benefits From Natural Resources with Particular Reference to the Salmon-Steelhead Sport Fishery of Oregon", paper presented at a meeting of the Committee on the Economics of Range Use and Development of the Western Agricultural Research Council, Reno, Nevada, June 16-17, 1964, pp. 13-28.

a modification of the Clawson technique. Questionnaires were sent to fishermen and total variable costs of the fishing trip and travel distance were obtained. Although fishing occurred in more than one location, fishermen were divided into distance zones for the analysis. A significant relationship was found between the average variable cost per day for salmon-steelhead fishing and days of fishing taken. Further analysis results indicated that days of fishing taken was associated significantly with average variable cost per day, average family income and average miles per trip. Distance was highly intercorrelated with cost per day as one would expect.

Wennergren estimated the value of three Utah reservoirs for boating by employing the Clawson model.[24/] Travel and on-site costs and number of boating trips were obtained at the reservoir sites through personal interviews. The three demand curves obtained were all price elastic. As in the Lerner, Knetsch and Brown studies, the upper limit on willingness to pay was set by the highest cost users while the lower limit was set by those participants nearest the recreation site. These limits establish boundaries for calculation of recreation benefits derived by the consumers. In the foregoing studies the maximum amount a consumer is willing to pay is established by the most distant participant and the minimum amount by the closest participant.

24/ Wennergren, E. Boyd, Value of Water for Boating Recreation, Utah Agricultural Experiment Station Bulletin 453, Logan, June 1965, pp. 6-20.

Knetsch has pointed out and Brown has agreed that the Clawson demand curve tends to underestimate the total consumer benefits derived from a recreation site.[25/] The travel time constraint is assumed to act as a demand shifter. For those participants living the greatest distance from the site, time had a negative influence on the number of recreation visits demanded even if monetary costs were to remain the same.

The above empirical studies employing Clawson's technique are useful for estimating demand and benefits for a particular site. The studies also isolate some variables which appear to be important. These studies include distance and time for travelling to a particular facility and household income. The Clawson technique does not explore a family's preferences for other individual outdoor recreation activities. Nor does it consider preferences for groups of recreational activities.

The Outdoor Recreation Resources Review Commission reached its goal in 1962 with the publication of 27 separate studies on various aspects of outdoor recreation. These studies centered around current needs for and supply of outdoor recreation facilities and the projected needs in 1976 and 2000. Numerous sub-contractors contributed to the overall studies of the commission.

Mueller and Gurin found in an ORRRC study of the recreation activities in a nationwide sample of 2,759 adults that 71 percent

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25/ Knetsch, Jack L., "Outdoor Recreation Demands and Benefits", Land Economics, 39:4, November 1963, pp. 394-395, and Brown, op. cit.

had participated in automobile pleasure riding during the previous year.[26/] Sixty-six percent had gone on picnics, 45 percent had participated in outdoor swimming or gone to the beach, 38 percent in fishing, 28 percent in boating or canoeing, 17 percent in hunting, 15 percent in camping, seven percent in horseback riding and six percent in skiing or other winter sports. They concluded that participation was greatest in those activities with the fewest barriers to entry. The barriers included time, money and skill. This perhaps partially explains the relatively lower participation rates in horseback riding, skiing, hunting, camping, etc.

In another ORRRC study, also on a nationwide basis, it was concluded that driving for pleasure accounted for an average of 20.7 activity days per person and more than 22 percent of the total activity occasions.[27/] Driving and walking for pleasure accounted for 41 percent of the total.

The ORRRC studies on a national basis, indicated that age, income, occupation, education and place of residence have significant effects on the amount and type of outdoor recreation in which people participate. For example, swimming is a very popular activity among teenagers, but participation declines as a person's

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26/ Mueller, Eva and Gerald Gurin, Participation in Outdoor Recreation, ORRRC Study Report No. 20, U. S. Government Printing Office, Washington, 1962, p. 5.

27/ Ferris, Abbott L., Betty C. Churchill, Charles A Proctor and Lois Zazove, National Recreation Survey, ORRRC Study Report No. 19, U. S. Government Printing Office, Washington, 1962, pp. 120-121.

age increases. However, interest in camping, boating, fishing and walking continues over a wider age span.

As might be expected, income affects the level of participation in recreation activities. For the range of activities it was found that participation increases rather sharply at incomes above $3,000, reaching a maximum in the $7,500-$10,000 bracket and declining somewhat among income groups above the $10,000 level.[28/]

Activities which require cash outlays for purchase or rental of equipment, such as camping, boating and horseback riding, are participated in most often by persons from the higher income groups. However, walking is participated in by all income groups.[29/]

Educational attainment, which is correlated with income, is positively associated with sports, swimming, sightseeing, and walking for pleasure. Participation in driving for pleasure increases as education increases through the high school level, but shows a decline among college graduates.[30/]

Occupation also affects participation in outdoor recreation.[31/] However, level of participation may be partially influenced by the presence or absence of a paid vacation. Professional and technical

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28/ Outdoor Recreation Resources Review Commission, Outdoor Recreation for America, op. cit., p. 28.

29/ Ibid, p. 38.

30/ Ibid, p. 215.

31/ Ibid, p. 218.

workers have the highest participation rates, followed by white collar workers. Farm workers have the lowest participation rates.

Persons living in suburban and adjacent areas participated to a greater extent in driving for pleasure, picnicking, swimming, hunting, fishing and camping than did persons living in cities.[32/] Persons living in rural areas participated most often in fishing and hunting.

Burdge, in a recently completed sociological study involving 1,562 personal interviews in Alleghany County, Pennsylvania, examined how a person's work affects the use of his leisure time.[33/] Outdoor recreation activities received the majority of the attention in the study. Burdge formulated the following hypotheses: (1) The status of a person's occupation will determine the extent and nature of the use of leisure; (2) the more irregular and longer the work pattern the less will be the opportunity and, therefore, participation in leisure; (3) differential renumeration will lead to differential use of leisure; and (4) different occupational subcultures or work enviormments will have different patterns in the use of leisure.

Burdge concluded that in general the persons in higher status occupations participated about twice as often in outdoor recreation

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32/ Ibid.

33/ Burdge, Rabel J., Occupational Influences on the Use of Outdoor Recreation, Unpublished Ph.D. Thesis, Department of Agricultural Economics and Rural Sociology, The Pennsylvania State University, 1965, p. 1.

activities as did persons in lower status groups.[34/] He also concluded that as incomes increase, participation rates increase for most activities, with the exceptions of picnicking, hunting, camping and active sports. The interrelationship of advancing age and high incomes tended to explain the decrease in participation among the highest income groups.

Persons employed on a full-time basis were found to be greater participants than persons employed on a part-time basis.[35/] Participation rates increased as the length of work day increased up to eleven hours per day. Beyond eleven hours, the rates declined. Irregular working hours and weekend work did not appear to hinder participation in outdoor recreation.

Burdge reached a tentative conclusion that persons in the same socioeconomic level, but with different occupations, have different use patterns for their leisure time activities.[36/]

Race was included in the ORRRC studies as one of the socioeconomic variables.[37/] Whites have higher overall rates of participation in outdoor recreation activities than do non-whites.

34/ Ibid, pp. 148-149.

35/ Ibid, p. 150.

36/ Ibid, p. 151.

37/ Outdoor Recreation Resources Review Commission, Trends in American Living and Outdoor Recreation, Study Report No. 22, U. S. Government Printing Office, Washington, 1962, pp. 55-57.

Participation by non-whites may be related to lower incomes and lack of opportunity. However, as the degree of urbanization increases, patterns of participation between whites and non-whites become more similar.

In the sample area, which is largely urban, there may be factors which tend to suppress the demand for outdoor recreation. Automobile ownership per capita is the lowest in the Northeast region of any area in the nation.[38/] Many outdoor recreation facilities can only be reached by automobile. For those persons who do own automobiles, the difficulty in reaching recreation areas may reduce demand. Such difficulties may arise due to traffic congestion and as a result, leave insufficient time to travel to recreation areas from urban centers for one-day or weekend outings. The interrelationship of congested highways and shortage of time may be a greater factor in reducing participation than lack of income.

Because of the possibility of shortage of time for one-day and weekend outings, it is hypothesized that recreation facilities should be located within one to two hours driving time from the expected clientele for day facilities. Facilities which attract participants for a weekend should probably be within two to three hours driving distance from the expected participants.

38/ Outdoor Recreation Resources Review Commission, The Future of Outdoor Recreation in Metropolitan Regions of the United States, Study Report No. 21, Vol. 2, U. S. Government Printing Office, Washington, 1962, pp. 1-2.

The writings of Clawson and his associates and the series of reports from the Outdoor Recreation Resources Review Commission serve as a useful framework from which the formulation of working hypotheses concerning consumer participation in outdoor recreation activities may be made. The hypotheses developed for more detailed study are:

1. Participation rates in outdoor recreation activities are related to driving distance and time.
2. Participation in outdoor recreation activities is related to socioeconomic characteristics of a household including:
    (1) household size
    (2) age of homemaker
    (3) occupation of head
    (4) income
    (5) educational level of head
    (6) race
    (7) farm or non-farm residence
    (8) presence of physical handicaps
    (9) length of work week of household head
    (10) time spent travelling to work
    (11) automobile ownership
3. Use of leisure time for outdoor recreation is related to family units.

Inclusion of variables and the proposed functional relationships for testing the above hypotheses will be described more fully in the next chapter.

CHAPTER III

METHODOLOGY OF THE STUDY

Sample Area

The sample area for this study included 39 counties in the Washington, D. C.-Baltimore, Maryland-Philadelphia, Pennsylvania Metropolitan Region, Figure 1. This area was chosen because it has the characteristics often cited in the literature as contributing to the growth in demand for outdoor recreation in increasing population, increasing incomes, increasing leisure time and increasing mobility; and because of the close proximity to the State of Delaware. Any point in the State is within two to three hours driving distance by private automobile from the urban center. An excellent system of highways including U. S. 13, U. S. 50 and Interstate 95, as well as the beltways encircling Washington and Baltimore, help to move traffic to the State if outdoor recreation participants from those areas are so inclined.

The Washington, D. C-Baltimore-Philadelphia Metropolitan Region is a part of the area along the Atlantic Seaboard which has been referred to as Megalopolis by Jean Gottmann. Megalopolis, extends from Washington, D. C. in the south, to Boston, Massachusetts in the north and contains one-fifth of the nation's population.[1/]

1/ Gottmann, Jean, Megalopolis, The Twentieth Century Fund, New York, 1961, pp. 3 and 26.

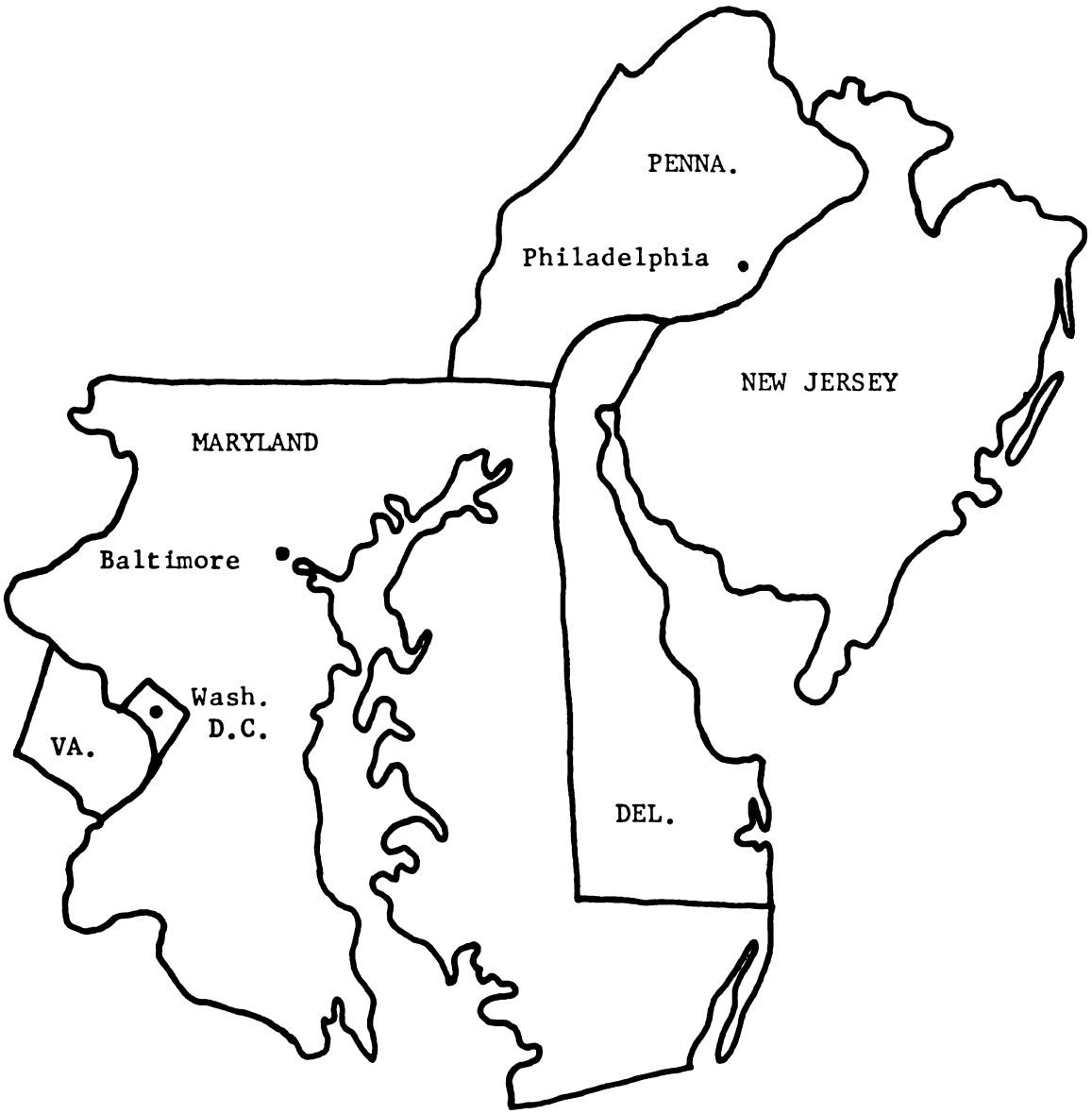

Figure 1. Sample area for the study

The sample area contains some of the fastest growing counties in the United States according to the 1960 Census of Population.[2/] The most rapid growth has occurred in suburban areas surrounding the large metropolitan centers. For example, Fairfax County, Virginia, and Montgomery County, Maryland, both adjacent to Washington, D. C., had population increases of 179 percent and 107 percent, respectively from 1950 to 1960, Table 2. At the same time, the District of Columbia lost 4.8 percent of its population. Bucks County, Pennsylvania, next to Philadelphia, had a population increase of 113 percent between 1950 and 1960, while Philadelphia lost three percent of its population. The city of Wilmington, Delaware, had a decrease of 13 percent in its population from 1950 to 1960. During the same interval, population increased 95 percent in outlying regions of New Castle County, Delaware.

In the 1950-60 decade, Delaware with a population increase of 40.3 percent, was the sixth fastest growing state, and Maryland with an increase of 32.3 percent, was the eighty fastest growing state in the 50 United States.[3/] As indicated above, the highest growth rates within the individual states were in suburban areas.

Although nearly 70 percent of the total population in the United States lived in urban areas in 1960, counties in the center

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2/ United States Department of Commerce, U. S. Census of Population 1960, PC(1), 1A, U. S. Government Printing Office, Washington, 1961, pp. 51-63.

3/ Ibid, pp. 1-25.

Table 2. Population for the United States and by state and county within the sample area for 1950 and 1960, percent increase from 1950 to 1960, and percent living in urban areas in 1960[a]

United States, state and county	Number of persons		Percent increase			Percent living in urban areas
	1950	1960	Total	Urban	Rural	1960
United States	151,325,798	179,323,175	18.5	29.3	-0.8	69.9
Delaware	318,085	446,292	40.3	47.0	28.9	65.6
Kent	37,870	65,651	73.4	50.3	80.0	19.4
New Castle	218,879	307,446	40.5	48.8	3.2	86.6
Sussex	61,336	73,195	19.3	18.0	19.6	18.7
District of Columbia	802,178	763,956	-4.8	-4.8	--	100.0
Maryland	2,343,001	3,100,689	32.3	39.5	16.5	72.7
Anne Arundel	117,392	206,634	76.0	160.2	36.6	47.1
Baltimore	270,273	492,428	82.2	121.6	-9.8	85.2
Baltimore City	949,708	939,024	-1.1	-1.1	--	100.0
Calvert	12,100	15,826	30.8	--	30.8	0.0
Caroline	18,234	19,462	6.7	--	6.7	0.0
Carroll	44,907	52,785	17.5	-0.3	20.4	11.6
Cecil	33,356	48,408	45.1	14.2	50.9	12.4
Charles	23,415	32,572	39.1	--	39.1	0.0
Dorchester	27,815	29,666	6.7	18.2	-0.2	41.3
Harford	51,782	76,722	48.2	68.7	41.0	29.3
Howard	23,119	36,152	56.4	68.3	54.3	15.9
Kent	13,677	15,481	13.2	14.6	12.8	23.3
Montgomery	164,401	304,928	107.4	135.7	19.1	86.1
Prince Georges	194,182	357,395	84.1	112.3	10.5	83.4
Queen Annes	14,579	16,569	13.6	--	13.6	0.0
St. Marys	29,111	38,915	33.7	--	9.5	18.1
Somerset	20,745	19,623	-5.4	-4.0	-5.7	18.0

(continued)

Table 2. (continued)

United States, state and county	Number of persons		Percent increase			Percent living in urban areas
	1950	1960	Total	Urban	Rural	1960
Maryland (cont'd.)						
Talbot	19,428	21,578	11.1	31.0	4.4	29.4
Wicomico	39,641	49,050	23.7	7.7	33.7	33.2
Worcester	23,148	23,733	2.5	4.3	2.2	14.0
New Jersey	4,835,329	6,066,782	25.5	28.4	6.7	88.6
Atlantic	132,399	160,880	21.5	18.4	40.7	83.8
Burlington	135,910	224,499	65.2	143.8	-8.3	71.3
Camden	300,743	392,035	30.4	34.2	-18.4	95.4
Cape May	37,131	48,555	30.8	42.9	19.0	54.0
Cumberland	88,597	106,850	20.6	26.9	6.4	72.8
Glocester	91,727	134,840	47.0	66.9	17.2	68.1
Mercer	229,781	266,392	15.9	21.8	-17.1	89.2
Ocean	56,622	108,241	91.2	99.4	86.9	35.7
Salem	49,508	58,711	18.6	21.2	16.2	49.8
Pennsylvania	10,498,012	11,319,366	7.8	9.4	4.0	71.6
Bucks	144,620	308,567	113.4	329.0	-15.7	75.3
Chester	159,141	210,608	32.3	39.4	27.3	43.8
Delaware	414,234	553.154	33.5	42.5	-46.5	96.0
Montgomery	353,068	516,682	46.3	73.4	-8.8	79.5
Philadelphia	2,071,605	2,002,512	-3.3	-3.3	--	100.0
Virginia	3,318,680	3,966,949	19.5	41.3	0.2	55.6
Fairfax	98,557	275,002	179.0	695.4	-15.4	78.0

a/ United States Department of Commerce, U. S. Census of Population, 1960, PC(1), 1A, U. S. Government Printing Office, Washington, 1961, pp. 1-25, 51-63 and 69-99.

of metropolitan areas or adjacent to metropolitan areas had over 80 percent of the population in urbanized areas (refer to Table 2). As the extent of urbanization in an area increases and land becomes relatively more scarce, the amount of open space decreases. A probable result of this trend is to cause increasing pressures to be placed on public officials and private land owners to provide leisure time facilities for use by the local populace.

The sample area is also characterized by a relatively high level of per capita incomes. Personal income data, available on a state basis, indicate that in 1964 the District of Columbia and Delaware ranked one and two respectively in per capita personal incomes, Table 3. All states in the sample area, except for Virginia, had per capita incomes which exceeded the 1964 U. S. average per capita income of $2,566. Within Virginia, only Fairfax County, adjacent to Washington, D. C., is included in the sample.

After adjusting for increases in the general price level, real per capita personal incomes have increased at varying rates between 1950 and 1964. For the District of Columbia, Delaware, New Jersey and Pennsylvania, the percentage increases have been less than the U. S. average. However, in the cases of the District of Columbia, Delaware and New Jersey, per capita incomes were at a relatively high level at the beginning of the period under consideration. Maryland and Virginia have shown the most rapid growth rates in per capita real incomes within the sample area.

Table 3. Per capita personal incomes for the United States and individual states in the sample area for selected years, 1950-1964 a/

Year	United States		Delaware		District of Columbia	
	Actual Dollars	Constant Dollars	Actual Dollars	Constant Dollars	Actual Dollars	Constant Dollars
1950	1,491	1,730	2,153	2,449	2,198	2,623
1955	1,866	1,747	2,649	2,480	2,324	2,491
1960	2,217	2,150	3,002	2,912	3,008	2,918
1964	2,566	2,374	3,460	3,201	3,544	3,278

	Maryland		New Jersey		Pennsylvania	
	Actual Dollars	Constant Dollars	Actual Dollars	Constant Dollars	Actual Dollars	Constant Dollars
1950	1,588	1,895	1,792	2,138	1,566	1,869
1955	1,991	2,134	2,311	2,477	1,902	2,039
1960	2,389	2,317	2,651	2,571	2,249	2,181
1964	2,867	2,652	3,005	2,780	2,601	2,406

	Virginia	
	Actual Dollars	Constant Dollars
1950	1,222	1,458
1955	1,535	1,645
1960	1,853	1,797
1964	2,239	2,071

a/ Actual dollar income data from United States Department of Commerce, Survey of Current Business, 45:7, U. S. Government Printing Office, Washington, July, 1965, p. 11. Constant dollar amounts obtained by using the BLS Consumers Price Index, 1957-59 = 100, obtained from United States Department of Agriculture, Agricultural Statistics, 1965, U. S. Government Printing Office, Washington, 1965, p. 588.

Mobility of the population is on the increase within the U. S. population and including the sample area as well. Major portions of the Interstate highway system are completed. These include beltways around Washington and Baltimore and improved highways to the beach areas of Maryland, New Jersey and Delaware from the metropolitan centers as outlined previously. Consequently, any of the above mentioned beaches are within two to three hours driving distance from these major population centers, making day use and weekend use feasible. Vacationers are also possible users of the recreation facilities in the sample area.

Sampling Procedure

Sampling is a technique whereby a portion of the population is chosen to represent the entire population of the study area. The sample group then should adequately reflect the behavior of the population in the 39-county study area.

A contract was signed with National Family Opinion, Inc. of Toledo, Ohio, for selection of the sample. National Family Opinion has a national sample of 85,000 households available for market studies by mail. The quota sample technique was used to obtain a representative sample.[6/] To insure elements of probability sampling,

6/ Cochran, W. G., Sampling Techniques, Wiley, New York, 1953, p. 105.

in order that a statistical analysis could be made on the data, the sample was drawn in conformance with four major controls. They were: (1) geographic region of the country, (2) size and type of community in which a family resides within a region, (3) annual family income by household within a region, and (4) age of the homemaker by household within a region. The basis for sample proportions within each control was determined from the 1960 U. S. Census of Population. Sample proportions are altered every two years based on reports issued by the U. S. Department of Commerce.

Based upon the above controls, 2,000 households were drawn from the 39-county area by National Family Opinion to be included in the outdoor recreation study. The study area included 2,910,363 households according to the 1960 Census of Population.[7/] Thus, one household in approximately 1,455 households was selected.

The manner in which the sample was drawn allows for a study of outdoor recreation preferences of the residents of the sample area. It is recognized that this study excludes tourists who do not reside in the sample area but visit the metropolitan centers or other sightseeing or natural attractions. Therefore, the demand for lodging and related facilities in the metropolitan centers is not included in the study. The study is confined to those outdoor

7/ U. S. Census of Population, 1960, op. cit., Part C, Table 49.

activities of the residents which use natural or human resources primarily from rural areas.

Questionnaire Design

An initial version of a mail questionnaire was designed to elicit the responses necessary to test the hypotheses discussed in Chapter II. Maximum clarity of the questions was a major objective at this stage because of the decision to use the mail approach. The questionnaire was first pre-tested on University personnel and then extensively reworked. Next the questionnaire was sent to the staff at National Family Opinion for suggestions regarding question format and provision of answer space.

The questionnaire was again revised and then sent by National Family Opinion, together with a cover letter, to a small group of cooperating households in the Toledo, Ohio, area on September 11, 1964. The questionnaires were assembled by National Family Opinion and sent to the author for evaluation and revision on September 29, 1964.

Again the questionnaire was extensively revised especially where householders in the pre-test had obvious doubts on how to respond to a question.

The final questionnaire was mailed by National Family Opinion to the 2,000 households on October 30, 1964. The questionnaires were again returned to National Family Opinion by the respondents

where they were assembled in groups and mailed to the author. On November 17, 1964, the final shipment was sent, making a total of 1,718 usable questionnaires that were returned for a response rate of 86 percent.

Socioeconomic Data

In addition to the data obtained from the questionnaires, considerable socioeconomic data were available for each household. These data were on a punch card and included the following:

1. State, county and city of residence
2. Farm or non-farm residence
3. Number of household members
4. Homemaker's age
5. Husband's age
6. Race
7. Homemaker's education
8. Husband's education
9. Occupation of principal wage owner
10. Income
11. Automobile ownership

One advantage of using a commercial organization such as National Family Opinion, Inc. is that the availability of information such as that above allows for a shorter questionnaire or for a greater quantity of non-socioeconomic information to be obtained.

Socioeconomic Characteristics of Sample Householders

In the study area nearly 90 percent of the sample households are located within Standard Metropolitan Statistical Areas (SMSA's), Table 4. According to the census definition, a SMSA is a county or group of contiguous counties which contain at least one city of 50,000 inhabitants or more. In the study these include: Washington, D. C.; Baltimore, Maryland; Philadelphia, Pennsylvania; Wilmington, Delaware; and Atlantic City and Trenton, New Jersey. Among the non-SMSA households, 6.8 percent of the sample are located in rural areas and 3.3 percent in cities of less than 50,000.

Among the family income groupings, the largest single category of households, 24.2 percent, is the $7,000-$9,999 range, Table 5. Over 17 percent of the households report incomes in excess of $10,000. This further illustrates the fact that incomes are relatively high in the sample area.

Within the age of homemaker distribution the largest number of 523 is found in the 35-44 category, Table 6. This group is followed by the age group 25-34 with 456 households. At the opposite extremes of the age distribution, 6.4 percent of the homemakers are less than 25, while 8.4 percent of the homemakers are 65 or over.

Table 4. Number and percent of sample households by place of residence, 1964

Place of residence	Sample households	
	number	percent
Rural	135	6.8
Cities 2,500-49,999	65	3.3
Metropolitan Areas		
50,000-49,999 Central cities	22	1.1
50,000-499,999 Outside central cities	83	4.1
500,000-1,999,999 Central cities	145	7.2
500,000-1,999,999 Outside central cities	170	8.5
2,000,000 and over Central cities	480	24.0
2,000,000 and over Outside central cities	900	45.0
Total	2,000	100.0

Table 5. Number and percent of sample households by family income levels, 1964

Income level in dollars	Sample households	
	Number	Percent
0- 999	17	0.9
1,000- 1,999	66	3.3
2,000- 2,999	122	6.1
3,000- 3,999	150	7.5
4,000- 4,999	209	10.4
5,000- 5,999	301	15.1
6,000- 6,999	299	14.9
7,000- 9,999	484	24.2
10,000-14,999	250	12.5
15,000-19,999	74	3.7
20,000 and over	28	1.4
Total	2,000	100.0

Table 6. Number and percent of sample households by age of homemaker, 1964

Age of homemaker	Sample households	
	Number	Percent
0-24	127	6.4
25-34	456	22.8
35-44	523	26.1
45-54	390	19.5
55-64	336	16.8
65-74	150	7.5
75-84	18	.9
Total	2,000	100.0

Preparation of Questionnaires for Analysis

The questionnaires were coded, the coding was checked and the data were placed on punch cards. The cards were then verified by checking against the original code sheets before the analysis began.

Methods of Analysis

A chi-square, contingency table analysis is used to measure whether or not response to the questionnaire is independent of socioeconomic characteristics of the households. These variables include household income, age of homemaker, occupation of household head, educational level, race, automobile ownership and place of residence. Likewise, a contingency table analysis is used to measure whether participation in one or more outdoor recreation activities is independent of the above socioeconomic variables.

In order to test the hypotheses developed in Chapter II, a multiple regression analysis is used. Frequency of participation per household is the dependent variable (Y) for the first run. A second run, using a 0-1 dummy variable for the dependent variable (Y'), is used to determine the association of the independent variables with participation in individual activities. Independent variables which are hypothesized to be associated with frequency of participation include: distance travelled to participate in the outdoor recreation activity (X1), amount of time required to travel to the facility

(X2), fee charged for admission (for selected activities) (X3), length of work week for household head (X4), time spent driving to work (X5), presence of physical handicaps - yes or no (X6), farm residence - yes or no (X7), household size (X8), age of homemaker (X9), automobile ownership - yes or no (X10), race (X11), educational level of homemaker (X12), occupation (X13), and household income (X14). The data for variables (X1) - (X6) were obtained from the questionnaire. Data for variables (X8) - (X14) were obtained from a master punch card for each household in the sample.

Participation is measured on a household basis for all activities except swimming. Because of the sample area's proximity to ocean and other coastal beaches, more detail was obtained. Swimming participation is separated for the household head, homemaker and children. Swimming activities are divided into: swimming pool at home, swimming pool away from home, ocean, bay, lake, pond, and river. Other individual activities analyzed include: picnicking; walking and hiking for pleasure; pleasure riding; camping; fishing; hunting; golfing; horseback riding; boating; water skiing; canoeing and sailing; ice skating; tobogganing; snow skiing; and vacation and weekend trips.

Analysis of the Data

The data from the study were analyzed on digital computers at Michigan State University and the University of Delaware.

CHAPTER IV

ANALYSIS OF THE RESULTS

A Comparison of Respondents and Non-Respondents by Socio-Economic Characteristics

The availability of socio-economic data on punch cards for each household allowed for a comparison to be made between respondents and non-respondents. For the comparison, a chi-square analysis was made of the data arrayed by characteristics in a contingency table.

Response was found to be independent of age of the homemaker and household income at the .05 level.[1/] However, there was interaction between response and place of residence at the .05 level.[2/]

Response was independent of occupation and education, but there was interaction between response and race of the respondent at the .05 level.[3/] There was also interaction between response and automobile ownership at the .05 level.[4/] Therefore, the participation rates for outdoor recreation activities may be biased, either positively or negatively by place of residence, race of the respondent and whether or not the sample householders owned an automobile, if these factors influence participation.

1/ The chi-square values are 8.96 and 12.58 respectively with 6 and 10 degrees of freedom.

2/ The chi-square value is 17.43 with 7 degrees of freedom.

3/ The chi-square values are 8.85, 1.92 and 45.82 respectively with 11, 6 and 2 degrees of freedom.

4/ The chi-square value is 41.88 with 2 degrees of freedom.

A Comparison of Participants and Non-Participants by Socio-Economic Characteristics

A chi-square, contingency table analysis was also made to compare those households reporting participation in one or more outdoor recreation activities with non-participating households. Participation was found to be independent of the place of residence and race of the respondent at the .05 level.[5/] However, participation was found to interact with household income, age of homemaker, occupation of household head, education, household size and automobile ownership at the .05 level.[6/] The above interacting factors have an effect on whether or not the members of a household participate or do not participate in outdoor recreation activities. A detailed multiple regression analysis will follow to measure the impact of isolated socio-economic variables on participation in specific outdoor recreation activities.

Participation Rates for Individual Outdoor Recreation Activities

A greater number of households participated in those activities requiring relatively little investment than in activities such as golfing, hunting, camping and skiing, Table 7. Eighty-four

5/ The chi-square values are 12.20 and 3.26 respectively with 7 and 2 degrees of freedom.

6/ The chi-square values are 85.06, 154.35, 73.20, 66.89, 83.09 and 216.46 with 10, 6, 11, 6 and 6 degrees of freedom respectively.

percent of the households participated in pleasure riding. Seventy-eight percent of the households indicated that one or more members went swimming or to the beach. The strong attractive power of the Atlantic Ocean is indicated by the fact that 50 percent of the households had members who went swimming there. Swimming pools attracted persons from 43 percent of the households. Sixty-five percent of the responding households had members who went picnicking and 49 percent had members who went for walks or hikes. Of the remaining outdoor recreation activities, participation rates for tobogganing and snow skiing were very low (only three percent). Participation rates for these and other activities such as horseback riding, hunting and golfing may be influenced by the level of skill required for participation.

Among participating households, the frequency of participation varied widely within the alternative activities. Pleasure riding participants indicated an average of over 27 trips during the previous year while those participating in walking and hiking indicated an average of nearly 31 separate walks. Frequency of participation in swimming varied both by type and household members involved. With the exception of ocean swimming, where safety may be a factor, children tended to go swimming more often than their parents. Households with swimming pools had members who went swimming more often than when travel was required.

Table 7. Number and percent of households participating by outdoor recreation activity with average frequency of participation per household in one year period, 1963-64

Activity	No. of households participating	% of households participating		Average frequency of participation	
				Per household	Per participating household
Pleasure rides	1,447	84		23.02	27.33
Picnicking	1,114	65		3.74	5.77
Swim-ocean	866	50	-Head	2.54	7.14
			Homemaker	2.66	13.87
			Children	2.04	5.47
Pleasure walks	840	49		15.02	30.72
Swim pool away from home	735	43	-Head	1.99	8.90
			Homemaker	2.98	12.52
			Children	7.73	21.08
Fishing	669	39		4.67	11.99
Boating activities	490	28		3.13	10.97
Ice skating	429	25		1.92	7.69
Swim-lake	367	21	-Head	.83	6.37
			Homemaker	1.05	7.98
			Children	1.83	10.11
Swim-bay	290	17	-Head	.65	6.07
			Homemaker	.83	7.71
			Children	1.18	8.59
Golfing	265	15		3.28	21.26
Swim pool at home	250	15	-Head	1.03	16.69
			Homemaker	1.59	22.95
			Children	4.67	35.82
Hunting	248	14		1.58	10.94
Camping	242	14		.43	3.08
Horseback riding	201	12		1.40	11.97
Swim-river	156	9	-Head	.38	4.14
			Homemaker	.36	3.92
			Children	.84	9.28
Swim-pond	63	4	-Head	.20	5.48
			Homemaker	.19	5.18
			Children	.39	10.58
Tobogganing	57	3		.21	6.33
Snow skiing	53	3		.22	7.04
Vacation trips	1,069	62		.97	1.56
Weekend trips	996	58		2.53	4.36

Although golfing was participated in by only 15 percent of the households, those persons went golfing an average of 21 times. Thus it appears that the desire and the ability to participate varies widely among the various outdoor recreation activities. Other relationships may be further clarified in the multiple regression analysis.

Vacation trips were taken by 62 percent of the responding households and weekend trips by 58 percent. Again a measure of the general affluence in the sample area is indicated by the fact that 1.5 vacation trips and over four weekend trips were taken by the average household.

Ensuing discussion will utilize data in Table 7 without further specific reference.

The most popular activities on vacation trips were relaxing and sightseeing, followed by visiting friends and/or relatives, Table 8. Swimming was most popular from among the more active recreational activities.

For weekend trips, relaxing, sightseeing and visiting friends and/or relatives again headed the list, Table 9, with swimming being the next most popular.

The World's Fair, held during 1964 and 1965 in New York City, attracted 152 vacationing households in the sample and 149 households on weekend trips. This special event may have decreased the demand for other activities during the years in which it was held.

Table 8. Number of households taking vacation trips by activity

Activity	Number of households
Relaxing	747
Sightseeing	716
Visiting friends/relatives	610
Swimming	502
Sports activities	205
Fishing	182
Boating	168
World's Fair	152
Camping	80
Other	148

Table 9. Number of households taking weekend trips by activity

Activity	Number of households
Relaxing	608
Sightseeing	544
Visiting friends/relatives	511
Swimming or at beach	306
Sports	155
World's Fair	149
Other	148
Fishing	123
Boating	106
Camping	64

Multiple Regression Analysis for Individual Recreation Activities

In general, the first run analysis using frequency of participation as the dependent variable resulted in R^2 values which were low. For pleasure rides, picnicking, swimming activities, walking, fishing, boating activities, horseback riding, tobogganing and weekend trips, the variation in frequency of participation explained by variation in the independent variables was less than 10 percent. For other activities the R^2 values ranged from .14 to .53. Major emphasis in this section will be placed on the analyses using either 0 or 1 as the value for the dependent variable to indicate whether or not a household participated in an activity.

Pleasure rides: Both mileage traveled round trip and time for the trip were related to participation in pleasure riding or driving in a positive manner over the range of the data, Appendix Table 1.

Households in the sample area are concentrated in the metropolitan centers (refer to Table 2). Participation in pleasure driving was done in the country outside of the urban centers by the majority of the 1,447 households participating. This involves both time and distance. Therefore, the signs of the coefficients appear to be logical for the sample data. The average distance traveled for a pleasure ride was 72 miles and

the time incurred was two hours and 51 minutes, suggesting a leisurely pace with stops enroute or a congested highway route or both.

There is a positive relationship between participation and lack of physical handicaps in the household, while participation is negatively associated with age. Automobile ownership is associated with participation although a provision was made in the questionnaire for the use of public transportation for pleasure rides. Participation is an increasing function of the educational level of the homemaker, but persons in the higher income groups are less likely to participate. Participation was not significantly associated with the length of work week, time spent driving to work, place of residence, household size, race or occupation at the .10 level. Partial correlation coefficients are indicated in Appendix Table 2. Inter-correlation exists between the time and distance variables as would be expected. Both variables are included because of the importance placed on them in studies cited earlier. Inter-correlation between variables makes the individual regression coefficients less reliable.

Among the socio-economic variables, age and educational level are both positively correlated with income level which appears logical. Age and educational level are negatively correlated. Age and presence of physical handicaps are positively associated.

Pleasure drives were taken by all members of a household as a group in 1,244 out of 1,447 cases.

Picnicking: The questionnaire was designed to allow for a first and second choice picnic spot for the participating households. Both are included in the analysis. Regression coefficients, partial correlation coefficients and related statistics are given in Appendix Tables 3 and 4. Frequency of participation is associated with distance to the picnic facilities in a negative manner and is positively associated with the time spent driving to the facility.

Participation in picnicking is an increasing function of household size and years of education, but a negative function of age and income. This suggests that the younger householders with children at home are more likely to go picnicking than are older persons.

With the exception of distance to the second choice facility and income, the variables were statistically significant at the .10 level or better for the 0-1 participation analysis. Variables which were not statistically significant included length of work week, time spent driving to work, farm or urban residence, automobile ownership, physical handicaps, race and occupation. Intercorrelation exists between the time and distance variables.

Walks and hikes: One question was included to measure participation in pleasure walks and hikes. When these walks or hikes originated away from home, the participant was asked the driving distance and time to where the walk originated. Statistical data are given in Appendix Tables 5 and 6. Participation is a negative function of the distance traveled and a positive function of the driving time. Suitable areas for walks or hikes to take place appear to be available relatively close to the home of the participant. Nearly one-half of the participating households (384) indicated that the walk originated at home.

Urban residents are more likely to take walks than are farm residents, perhaps suggesting the desire for exercise among those with more sedentary occupations. Participation is a positive function of the length of work week, household size and income level. The regression coefficient for income was not significant at the .10 level, but was retained for explanatory purposes.

Among the 840 participating households, 72 percent reported that all members participated in the walks or hikes while in the remaining instances, only individual members participated.

Pleasure rides, walks and hikes and picnicking are three activities which were participated in by a large percentage of the respondents. Specialized skills and investments in special equipment are not required in order to take part in these activities.

Two patterns emerge when the functional relationship between participation and driving distance and time is examined. A positive relationship was found between participation and driving distance for pleasure rides, but the relationship was negative for picnicking and pleasure walks and hikes. These relationships may be explained in terms of the point of origin of the participants and the location where the participation took place.

The majority of the participants in pleasure rides preferred to drive outside of the urban enviornment in which they lived to seek a change of scenery in the country. However, most of the participants in picnicking and walking remained relatively close to home as discussed above. The nature of the functional relationship thus is due to the travel pattern for participation. Consumer preferences and/or the availability of suitable facilities determine the travel pattern necessary for participation.

Swimming activities: Of the various swimming activities, ocean swimming was participated in by the greatest number of sample households. Participation is an increasing function of distance traveled to the ocean and of time required for the travel, Appendix Tables 7 and 8. Ocean beaches are included in the resource-based category of outdoor recreation facilities. Their strong attractive power is apparent even though the average distance

traveled by participants was 135 miles requiring an average time of two hours and 45 minutes. In the sample area the strong desire to visit ocean beaches by consumers who are clustered in the three metropolitan centers helps to explain the positive functional relationship between participation and distance and time.

Consumers have the alternative of visiting beaches in Delaware, Maryland, New Jersey or Virginia. The majority of the participants in each of the sample states select those beaches which are closest, Table 10. Sample residents of Delaware, Maryland, New Jersey and Virginia tend to visit beaches within their own respective states. Residents of the District of Columbia and Pennsylvania choose beaches in Maryland and New Jersey, respectively.

Heads participated from 35 percent of the households, homemakers from 37 percent, but children from only 11 percent of the households. This difference between adult and child participation may be due to the danger associated with relatively small children swimming in the ocean surf.

Participation in ocean swimming is a decreasing function of age for heads of household and homemakers, and an increasing function of household income for all members. Non-whites are less likely to participate than are whites.

Participation by heads of households at swimming pools was not found to be significantly related to the independent variables.

Table 10. Number of households, by state of residence and by first choice state of participation for ocean swimming

State of residence	No. of households	State of participation	No. of households
Delaware	39	Delaware	27
District of Columbia	38	Maryland	22
Maryland	192	Maryland	128
New Jersey	172	New Jersey	157
Pennsylvania	406	New Jersey	229
Virginia	15	Virginia	10

Participation by both homemakers and children was related to the same sets of independent variables, and as a result exemplary statistical data for homemakers only are included in Appendix Tables 9 and 10. Participation was a negative function of distance traveled to the pool, and a positive function of the time required for the travel.

The presence of physical handicaps is a deterrent to participation. Household size is positively associated with participation. Participation by homemakers is a negative function of age, while participation by children is a positive function of homemaker's age. Non-whites are less likely to participate than are whites. Those homemakers and children in households where the head is in a professional occupation are more likely to participate than

those whose heads are employed in blue collar jobs. This statement is reinforced by the fact that participation is a positive function of income.

Children in 36 percent of the households participated while homemakers from 23 percent of the households participated.

Participation in bay swimming is a positive function of distance traveled to the bay and time required for the travel, Appendix Tables 11 and 12. Within the immediate sample area there are two bays; the Chesapeake Bay, between the eastern shore and western shore of Maryland, and the Delaware Bay between Delaware and New Jersey. The bays are included in Clawson's resource-based category. The location of the bays, relative to the majority of the potential participants, may help in explaining the positive relationship between participation and distance as was also the case for swimming at ocean beaches. If persons desire to swim in salt water there is the choice of either a bay or the ocean. For user-oriented recreation facilities there may be more alternatives available to the consumer which are closer to his home.

Participation is negatively associated with age of homemaker and income. For children who participate, participation is a positive function of household size. Thus, the younger families in the lower income groups are more likely to participate.

The bays may attract a group of consumers who cannot afford to drive the distance required to reach the ocean beaches. The

bays are closer to the concentration of population in the sample area. Participants reported traveling an average distance of 59 miles taking one and one-half hours enroute.

Ten percent of the responding households reported the head of household and homemaker participating while 13 percent of the households had children who participated.

Statistically significant results were not obtained for swimming at other types of facilities.

A comparison of the swimming activities for which significant results were obtained yields two patterns with respect to participation and the time and distance variables. For visits to salt water beaches at the ocean or bays, a positive relationship was found between participation and the distance traveled and the time required for the travel. The location of the salt water facilities in relation to the potential participants in the sample area plus the strong attractive power of the two types of resource-based beaches may explain the positive relationship.

Swimming pools, which tend to be located for the convenience of potential participants, showed a negative relationship between participation and distance traveled. Of the 735 participants, 81 percent said they traveled less than 25 miles to the pool. This indicates that by virtue of the location of the pools, it is not necessary to drive as far as was the case for the resource oriented

beach facilities. It may also indicate that potential participants are not willing to drive as far to swim at pools as they are to swim at the bays or ocean. The combination of the two factors, i.e. location of facilities and lack of willingness to drive greater distances, may explain the negative relationship between participation and distance. Thus hypothesis (1) as developed in Chapter II, is accepted for the three swimming activities outlined above.

Among the socio-economic variables, swimming or visits to the beach decline as age increases. Non-whites may face problems of discrimination or lack the necessary income to visit at ocean beaches or swim at pools to the extent that whites do.

While physical handicaps reduce the extent of swimming participation at pools, it may be that persons not actually able to swim visit the salt water beaches.

Swimmers who prefer salt water may tend to substitute visits to ocean beaches for visits to bay beaches as incomes increase based on the findings of this study.

Boating activities: Participation in boating activities is a positive function of both the distance traveled and time required to get to a body of water where the activity took place, Appendix Tables 13 and 14. An additional explanatory variable consisting of miles times distance was significant at the .01 level and positively associated with participation.

Within the sample area the major suitable bodies of water for boating include the Atlantic Ocean, the Delaware and Chesapeake Bays, and most of the tributaries leading into the bays or ocean. There are no natural lakes. Participants indicated that they drove an average of 100 miles to the location of their choice. Mill ponds which are navigable and publicly owned restrict the size of outboard motor to 5 H.P. or less. Thus, acceptable boating areas are relatively few and in the resource-based category.

Participation is more likely among automobile owners than non-owners. Also, participation is an increasing function of income level. Automobile ownership and income level are positively correlated as are travel time and distance traveled.

Camping: Miles traveled to the campsite and time required for travel are significantly associated in a positive manner with the dependent variable, Appendix Tables 15 and 16.

Campers drove an average of 244 miles to the campground of their choice. The majority of the potential campers are located in the urban centers, but campgrounds tend to be located near a resource-based area such as the Atlantic Ocean, in mountainous areas, near lakes or other bodies of water.[7/] Campers

7/ Based upon observations from a map of public and private campgrounds in the northeast, provided by the Northeastern Forest Experiment Station, U. S. Department of Agriculture Forest Service, Syracuse, New York.

apparently prefer to remove themselves from the urban environment. The desire to do so, and the location of the campgrounds in relation to the preponderence of population in metropolitan areas implies the positive relationship between participation and time and distance. Eighty households indicated that they camped while on vacation. Thus, they had the necessary time available to drive to some of the more distant campgrounds.

The assumption was made that most campers would be charged a daily fee at both private and public campgrounds. A question was included to determine the amount. The dependent variable was significantly associated with the daily fee. Within the range of the data, there is a positive relationship between daily fees charged and participation. The function does increase at a decreasing rate. There are several implications. First, the majority of the daily fees may be very low. The average fee for participating households was $1.25 per day. The relatively low fee may suggest a minimum of facilities at a given campground. Any improvement in facilities provided may be welcomed by campers and they actually will participate more often and be willing to pay more for better facilities. These include such items as flush toilets, hot showers, electricity, etc. More research is needed to substantiate this point.

The significant relationship between age and frequency of participation suggests that there is a tendency for participation to decline for those households with homemakers past the age of 50.

Although the regression coefficient for income was not significant at the .10 level, the income variable was retained for explanatory purposes. The income coefficient has a negative sign.

Household size was positively associated with participation. This is consistent with the relationship with age, since age and household size are negatively correlated.

Boating and camping, while appealing to a smaller segment of the sample households than pleasure riding, picnicking, walking and ocean swimming, appear to be activities for which a relative strong preference is maintained by the participants. The distance that the participants are willing to drive is an indication of the preference among the relevent groups within the sample. Both types of facilities tend to be located at or near resource-based attractions. Hypothesis (1) is accepted for these two activities and hypothesis (2) is accepted in part based on the significant socio-economic variables noted in the discussion.

Fishing: The questionnaire was designed to allow for two choices for fishing locations, including distance and time required to get to those locations. Participation is significantly related to both distance and travel time at the first choice location, Appendix Tables 17 and 18. The average distance traveled to the first choice fishing site was 29 miles. This is a function of the total miles driven by all fishermen and the total number of households in

the sample. Participation is a negative function of distance traveled. This suggests that either it is not necessary to drive as far to participate because of alternatives relatively close to home, or fishing is an activity where the householders are not willing to drive as far to participate, when compared to the resource-based facilities such as ocean beaches.

Participation is positively related to the daily fee charged per person. But fee fishing is relatively unimportant in the sample area at the present time since only six households reported paying a fee. Slightly over one-half of the households who reported going fishing indicated that their household members fished in salt water where there is free access. The remaining fished in inland fresh water areas.

Fishing is primarily an activity of the male head of the household, his children or the head and children together. These combinations accounted for 80 percent of the households reporting fishermen. This helps to explain why participation is an increasing function of household size.

The lack of physical handicaps is positively related to participation as is urban residence and automobile ownership. Participation is an increasing function of level of education, but a decreasing function of income level over the range of data encountered.

Hunting: Both frequency of participation and whether or not household member participation are negative functions of the distance traveled to the hunting site, and positive functions of the time required and the fee paid per hunter per day, Appendix Tables 19 and 20.

Only eight households reported hunters paying a fee at a private shooting preserve. This may explain why there is a positive relationship between frequency of participation and the fee paid.

Frequency of participation is a negative function of time required for driving to work. This may be related to the problem of having enough time at the end of a working day for hunting, but it also is related to farm versus urban residence. Participation in hunting is more likely to occur among farm residents who are perhaps able to hunt on their own property than among urban residents. This may provide an indication that hunting participation is likely to decline in future years as the farm population becomes a smaller percentage of the total and if obtaining access to hunting lands becomes more difficult.

Older persons are less likely to participate than are young persons and participation is more likely as the level of education of the head of household increases.

Frequency of participation increases as the size of household increases. Hunting is largely an activity for the head of

household or for his children. Over 90 percent of the 248 participating households reported either the head or children or both as hunters.

Participation is a positive function of automobile ownership. Using the occupational ranking, participation is greater among farmers and blue collar workers - both skilled and unskilled - than among professional persons. Hunting participation increases as income increases.

Golfing: Participation is negatively associated with distance traveled to the golf course and positively related to the time required to travel, Appendix Tables 21 and 22.

Golf courses tend to be located near the residences of golfers since the average golfer drove seven miles to the course. This is an example of a facility that is user-oriented, and helps to explain the negative relationship between participation and distance driven. That is, golf courses are clustered relatively close to the centers of population in or near the cities. Urban residents in the sample are more likely to participate in golfing than are farm residents. Golfers may be accustomed to having the courses close to their residence and therefore be unwilling or unable to drive relatively long distances to participate.

The positive relationship between participation and the time required for travel to the golf course may imply that within

the distance traveled, time is not a limiting factor. That is, although highway congestion and/or relatively low speed limits are a probability in urban areas, the apparently strong preferences among the golfing population appear to over-shadow any inconvenience encountered in getting to the course as long as the courses are located close to the user.

Frequency is positively associated with income, except for the highest income groups. Participation by non-whites is less likely than for whites. Also, participation is positively related to educational level. In over 80 percent of the participating households, only the head or his children were golfers.

Fishing, hunting and golfing are three outdoor recreational activities which in general are not participated in by the entire family.

Fishing, and especially hunting and golfing, require an investment in special equipment and require skill by the participant. Although non-farm residents are more likely to fish and golf than are farm residents, farm residents are more likely to hunt than are non-farm residents. Even though the entire family does not generally participate, this does not necessarily imply that individuals participate by themselves. Only 12 percent of the golfers, 24 percent of the hunters and 26 percent of the fishermen indicated that no one accompanied them on their outings.

For each of the three activities, about half of the participants indicated that friends accompanied them. In other instances, relatives or business associates were the companions.

Hypothesis (1) was accepted for fishing, hunting and golfing; hypothesis (2) was accepted in part for the significant socio-economic variables noted but hypothesis (3) was rejected since entire family units do not tend to participate in the three activities.

Horseback riding: Participation is a negative function of the distance traveled to where the ride begins and a positive function of the time required, Appendix Tables 23 and 24.

Participation is an increasing function of household size which is substantiated by the fact that in 149 out of 201 participating households, only the children went horseback riding. Participation is more likely to occur in households where the homemaker is 40-50 years old than in households where the homemaker is either relatively young or relatively old. This appears to be consistent with the high degree of participation among children of a certain age. Participation is also an increasing function of income.

Winter activities: Participation in ice skating is a negative function of distance traveled and a positive function of time incurred in travel to the site, Appendix Tables 25 and 26. The

average distance traveled to participate was only 1.6 miles. Ponds and lakes in public areas and indoor rinks apparently are available relatively close to the residences of the participants.

Ice skating is largely an activity for children. Over 60 percent of the participating households reported only children participating. This assists in explaining why skating participation is a positive function of household size.

Frequency of participation is positively associated with lack of physical handicaps, educational level and income. Non-whites participate less frequently than do whites.

When the values of 0 or 1 are used for the dependent variable, participation is positively related to length of work-week, household size, and income.

Participation in tobogganing is a negative function of the distance traveled to participate and a positive curvilinear function of the time required for travel, Appendix Tables 27 and 28. Participation is an increasing function of income although the coefficient for income was not significant at the .10 level. Tobogganing may be limited by the availability of sufficient slopes and snowfall in the sample area. It is possible for commercial enterprises to construct the slope and provide artificial snow. However, the extremely low rate of participation in this activity (three percent of the households) suggests that this is not being done or that persons in the area do not desire to participate.

In 24 of the 57 participating households the entire family participated, while in 19 cases only the children participated.

Participation in snow skiing is a negative function of the distance traveled and a positive function of the time required, Appendix Tables 29 and 30. Ski slopes are somewhat in the user-oriented category of facilities, especially as artificial snow is used to bring skiing closer to urban areas where sufficiently cold temperatures are lacking. Participation in skiing is a positive function of income. In 31 out of 53 cases, the entire family participated in skiing.

Among the winter outdoor recreation activities, skiing and tobogganing stand out because of the low participation rates (three percent). This may be due to the lack of facilities within relatively short distances of the urban centers. Also, in the case of skiing it may be due to the skill necessary for participation and the investment in skiing equipment.

Ice skating attracts a much greater percentage of participants (25 percent), but these are children for the most part. Both ice skating and horseback riding primarily appeal to children.

Vacations: The questionnaire allowed respondents to indicate the number of vacation trips and the length of the trip and round trip mileage for up to three separate trips. The two analyses indicate that vacation trips are the only case where the R^2 value is greater

when frequency of participation is used as the dependent variable than when 0 or 1 is used as an indicator of participation, Appendix Tables 31-34.

The average distance traveled round trip on the first trip was about 1,130 miles, indicating that numerous persons leave the sample area for their vacation. The average length of stay was 4.75 days. Eighty-six percent of the vacationing households indicated that their mode of transportation was their private automobile.

The number of trips taken increases as age and income increase and if there are no physical handicaps among household members.

Weekend trips: Provisions were made in the questionnaire to indicate the round trip mileage for up to three separate weekend trips. The average number of trips taken was 2.5. Participation is positively associated with the mileage driven, Appendix Tables 35 and 36. The relationship is the same as for vacation trips.

Participation is more likely when no physical handicaps are present in the household and is an increasing function of household size, educational level and income. The regression coefficients for income were not significant at the .10 level, but were included for explanatory purposes. Participation is more likely among those households whose head is in a professional occupation than among blue collar or unskilled workers.

The occupational rankings are negatively correlated with educational level and income.

Over 80 percent of the households taking weekend trips used their own automobile as the source of transportation.

Significant Variables Which May Aid in Predicting Participation in Outdoor Recreation Activities

Although for most activities, less than 50 percent of the variation in participation rates is explained by variation in the independent variables, some significant relationships emerged from the analysis. The relatively low R^2 values may be due to specification errors, errors in measurement due to memory loss on the part of respondents and possibly some confounding of effects. These problems also tend to enlarge the standard errors of some regression coefficients and bias some coefficients. Problems such as these are inherent to a relatively new area of research where the full nature of the functional relationships have not yet emerged. Some relationships are identified and these may be useful for policy purposes.

Time and distance variables: When participation was functionally related to the distance traveled to the participation site and the travel time required, two patterns emerged. For one group of activities, participation was positively related to both distance traveled and time required. For the second group, participation was a negative function of the distance traveled but a positive

function of the time required. Activities in the first group included pleasure rides, ocean swimming, bay swimming, boating and camping. The second group included the following activities: picnicking, walking for pleasure, swimming at a pool, fishing, ice skating, golfing, hunting, horseback riding, tobogganing and skiing. Although vacation and weekend trips may include non-recreation activities, they were found to be in the first group with regard to distance traveled.

It is hypothesized that the nature of the relationship between participation and the time and distance variables may be explained by noting the place of residence for potential participants in the sample area in relation to the areas of participation.

For activities in group one, which happen to be of a resource-based nature, there are few alternatives available within 50 miles of the urban residents who comprise the majority of the sample. Thus, they must drive a distance greater than 50 miles in order to participate and are clustered on the mileage scale at distances greater than 50 miles, while the non-participants are clustered at the 0 intercept on the mileage scale.

The same relationship holds for the time variable because of the amount of time involved in traveling to the point of participation compared to the non-participants with no expenditure of time. Therefore, those consumers whose marginal utility per dollar

expended is equal to other marginal utilities in the bundle of goods purchased will be willing to travel the distance necessary and expend the necessary time. A portion of the non-participating consumers may face budget limitations which prevent them from taking part in the resource-based activities.

For the second group of activities the facilities tend to be of a user-oriented or intermediate variety. That is, they are located with the consumers in mind. Most participants in the sample traveled 25 miles or less to take part in these activities. Thus, most participants are clustered at 25 miles or less on the mileage scale compared to the distances of 50 miles or greater for the first group of activities. Furthermore the user-oriented activities may be of a nature that they will not attract many participants from greater distances. Hence, the negative relationship between participation and distance.

It is further hypothesized that within the range of mileage traveled to participate, the time expended per mile of travel is proportionately greater than for the activities in group one. Most of the participants live in urban areas where traffic congestion may be greater than in rural areas and where speed limits are likely to be lower. As a result, those consumers who have a strong enough desire to participate, and are able to do so, will brave the traffic conditions and expend the necessary time. Thus, participation is a positive function of time over the range of miles driven.

The functional relationships between participation and the distance and time variables may not be the same in other areas where population is more evenly dispersed in relation to resource-based and consumer-oriented facilities.

Length of work week and time required to drive to work: In general, these variables did not serve as significant predictors of outdoor recreation participation.

Socio-economic variables: Participation in picnicking, swimming, ice skating, vacation and weekend trips is less likely where physical handicaps are present among household members. Urban residents are more likely to take walks than are farm residents. Farm residents are more likely to participate in hunting than are urban residents. This agrees with the findings of the ORRRC studies and with Burdge's study. Participation in swimming, pleasure rides, picnicking, and hunting is less likely as age increases. No significant relationship was found between age and participation in walking, fishing, boating, golfing and camping. In those activities where participation is a decreasing function of age, the opposite relationship is true between participation and household size since age and household size are inversely related. In addition, participation in walking, fishing and camping is an increasing function of household size.

Non-whites are less likely to participate in swimming, golfing and ice skating, while no significant relationship was found between race and participation in other activities.

Participation in pleasure rides, picnicking, fishing, golfing and hunting was found to be more likely as the level of education increases. As the level of income increases, participation is more likely for pleasure rides, ocean and pool swimming, walking, boating, ice skating, golfing, horseback riding, tobogganing, skiing, and vacation and weekend trips. Participation decreases as income increases in the case of picnicking, fishing, bay swimming, and camping. The ORRRC studies found camping participation to be positively associated with income, but Burdge, in the Pittsburgh study cited earlier, found a negative relationship.

Participation in boating and hunting is likely to be more frequent among blue collar workers than among professional and technical persons, while participation in swimming at pools and weekend trips is more likely among professional and technical workers than among blue collar workers. For other activities there was no significant relationship found between participation and occupation.

User-day projections based upon present participation rates: One means of projecting future participation in outdoor recreation activities is to use current rates of participation and projected population. Population projections were made for the sample area

for 1970 and 1980 based upon the growth rates from 1950 to 1960. The projections assume that the same fertility and migration rates will continue over the time interval involved. Population is projected to increase from nearly 9.8 million in 1960 to 12.4 million in 1970, and 18.8 million in 1980, Table 11. Participation rates for each activity are from Table 7. These rates are considered as per capita rates except where evidence from the study indicated that all members of the household did not participate in an activity. Adjustments were made in the participation rates for the following activities: hunting, horseback riding, fishing, ice skating and golfing. The first four participation factors were divided by two because primarily children, or in the case of hunting, heads of households and children participate. For golfing, the rate was divided by three because primarily only heads participate with children or other household members on rare occasions. The average household size is 3.796 based on this study.

Table 11. Population used to project user days for outdoor recreation activities in the sample area

Year	Population
1960	9,774,737 (actual)a/
1970	12,381,000 (estimated)b/
1980	18,811,000 (estimated)b/

a/ From Table 2.
b/ Assumes constant fertility and migration rate as experienced between 1950 and 1960.

The projections indicate that over one-half of the total user days of participation will be comprised of pleasure rides and walks, Table 12. In the ORRRC study cited in Chapter II, 40 percent of the total user days was accounted for by the two activities.

Table 12. Projected user days for outdoor recreation activities in the sample area for 1970 and 1980 based on current per capita participation rates

Activity	User days	
	1970	1980
Pleasure rides	285,010,600	433,029,200
Pleasure walks	185,962,600	282,541,200
Swimming	169,124,500	256,958,300
Picnicking	46,304,900	70,353,100
Boating activities	38,752,500	58,878,400
Fishing	28,909,600	43,923,700
Golfing	20,304,800	20,566,700
Ice skating	11,885,800	18,058,600
Hunting	9,781,000	14,860,700
Horseback riding	8,666,700	13,167,700
Camping	5,323,800	8,088,700
Skiing	2,723,800	4,138,400
Tobogganing	2,600,000	3,950,300

Swimming at all facilities is the third most important activity in terms of total days of participation. Among swimming facilities, pools at or away from home and ocean beaches account for over 80 percent of the user days in the projections.

The remaining activities in the study are projected to have total user days which are sharply below pleasure rides, pleasure

walks and swimming. In fact, rides, walks and swimming comprise nearly four-fifths of the total, leaving to the ten remaining activities only one-fifth of the expanding total.

Since the above user day projections are based upon current participation rates, some additional interpretation may be desirable using the relationships found among the socio-economic variables. Estimates from ORRRC Study 26 will be utilized.[8/] The aggregate effect of changes in the composition of the population with regard to income, education, occupation, residence, age and leisure is considered. The net impact of the above changes is an increase in per capita participation rates for all activities except hunting, Table 13. For the purposes of this study, it was assumed that the rate of change in per capita participation will remain constant on an annual basis. These data were then used to project total user days for 1970 and 1980 considering both population increase and changes in the composition of the population, Table 14.

The revised projections show swimming as the second most important activity with the three major activities accounting for 80 percent of total user days as in the case of the original projections.

The impact of the above projections on resource use will be discussed in Chapter V.

8/ ORRRC Study Report No. 26, op. cit. p. 28.

Table 13. Annual percentage changes in per capita participation rates for selected outdoor recreation activities a/

Activity	Annual percentage change
Pleasure drives	.92
Swimming	2.11
Pleasure walks	.77
Picnicking	.88
Fishing	.14
Boating	.55
Camping	2.76
Horseback riding	.83
Hunting	.43
Ice skating	2.84
Tobogganing	1.00

a/ From ORRRC Study Report No. 26, Table 11, p. 28.

Table 14. Projected user days for outdoor recreation activities in the sample area for 1970 and 1980 adjusted for estimated changes in per capita participation rates a/

Activity	User days	
	1970	1980
Pleasure rides	313,982,160	497,174,730
Swimming	208,248,420	343,488,860
Pleasure walks	201,686,490	317,341,570
Picnicking	50,762,100	80,322,970
Boating	41,104,920	63,957,400
Fishing	29,342,970	44,770,180
Golfing	20,304,800	20,566,700
Ice skating	15,600,060	26,147,290
Horseback riding	9,409,560	14,860,690
Hunting	9,285,750	13,920,140
Camping	6,933,360	11,662,820
Tobogganing	2,847,630	4,514,640
Skiing	2,723,800	4,138,400

a/ Based on percentage changes in participation rates from Table 13.

Additional Respondents' Comments

The questionnaire allowed for respondents to indicate their dissatisfaction, if any, with present recreation facilities, to indicate additional facilities that may be desired, to indicate whether or not they would like to vacation on a farm where they would pay room and board, and to indicate their idea of a "good" vacation. The tabulation and summarization of these comments may be useful in allocating resources to recreation enterprises.

Dissatisfaction with facilities: Of the 1,718 households that responded to the questionnaire, 184 homemakers indicated that they or members of their household were displeased with some facility they had used during the previous year. They were asked to indicate the type of facility with which they were dissatisfied and the reason for their displeasure. The disfavorable comments tend to indicate that some facilities are being over-utilized in the minds of the consumers who complained. Forty-nine of the householders indicated they were not satisfied with the beach area(s) they had used. Of the 49 cases, 28 indicated that the beach was too crowded and 18 said the beach was dirty. Both of these reasons may be related to overuse. However, if the beaches are dirty this may be due to the lack of adequate personnel to clean the beachlands to the degree expected by the dissatisfied consumers.

Twenty-nine households were dissatisfied with restroom facilities used in conjunction with a recreation enterprise and

the unanimous reason given was that the facilities were dirty. Facilities at state parks evoked unfavorable comments from 15 households. The primary reasons given were crowded and dirty conditions. Crowded and dirty conditions at swimming pools were mentioned by 12 out of 13 householders who indicated dissatisfaction with those facilities.

Ten householders were not pleased with campground facilities they had utilized. Eight indicated crowded conditions as the reason, one stated lack of facilities was the cause and the remaining individuals indicated that an insect problem was the cause.

Ten families who rented beach cottages felt that the rental fees were excessive or that the cottages were dirty.

Seven golfers indicated that the courses they used were either crowded or too expensive. Seven householders were not pleased with the picnic facilities they had used with crowded and dirty conditions the major reasons given.

Several other facilities were mentioned and the major reasons given were crowded and dirty conditions.

A summarization of the reasons given for dissatisfaction with outdoor recreation facilities indicates that crowded and dirty conditions are the primary reasons for the displeasure.

Facilities desired: New facilities were desired by 233 of households who responded to the questionnaire. Swimming pools were mentioned by 86 respondents and other water-oriented recreation

facilities (beaches, etc.) by 30 respondents. Ice skating ponds or rinks were desired by 27 households and public parks by 15 households. More public golf courses were proposed by 10 households and snow skiing facilities by seven households.

The fact that more swimming pools, water based facilities, parks and golf courses are desired is related to the crowded conditions expressed earlier. The lack of sufficient skating and skiing facilities, in addition to the ones previously mentioned, may be reducing the participation rates in these activities.

Acceptibility of a farm vacation: The sample households were queried about whether or not their families would like to take a farm vacation. This would include participation in farm activities and the payment of room and board during the stay. They responded in the following manner: 449 homemakers said yes, 1,168 said no, and 101 did not answer the question. Of those who answered yes, the reason most often given was that the entire family would enjoy the new experience. The next most important reason offered was that the children would benefit from the experience. Other reasons included the enjoyment of outdoor life and the fact that one or both of the parents had lived on a farm while growing up. Twenty-two households take farm vacations and twenty homemakers said they had relatives or friends living on a farm.

Of the 1,168 homemakers who answered no, 374 failed to specify a reason and 340 said their families were not interested in farm

life and preferred other activities. Others mentioned that they had lived on a farm while growing up and did not care to vacation there, that health was a problem and farm activities were too strenuous for a vacation, etc.

The above comments do suggest that a segment of the population would be interested in farm vacations. Further analysis is needed to determine the feasibility of developing farm vacation businesses in the sample region.

Respondents' ideas concerning a "good" vacation versus actual vacation activities: The respondents were asked what their family's idea of a "good" vacation was and these answers were related to what the household members actually did on vacation.

The most popular ideal vacation was traveling in the U. S. and sightseeing as mentioned by 374 homemakers. While 177 households actually went sightseeing, 135 did not take a vacation trip and the remainder participated in other activities.

Of those respondents answering the question, 280 indicated that their idea of a good vacation was a trip to the ocean. One-half of those respondents actually went to the beach, while 112 did not take a vacation. The remainder participated in other activities.

Relaxing as a family group was mentioned by 221 homemakers. About one-half indicated this as their actual vacation activity while 84 households did not take a vacation.

Trips to specific locations within the U. S. were mentioned by 134 homemakers. These included Florida, California, Hawaii, Alaska, New York City and New England. Eleven householders actually took trips to the areas specified, 60 did not take vacations and the remainder participated in other activities.

Foreign travel was mentioned by 117 homemakers as a good vacation. Of this group, only 13 actually made foreign trips, 24 did not take vacations and 80 households participated in domestic travel. This may be an indication of the extent of preference for foreign travel among those households interviewed. Actual participation in foreign travel may be hindered by such factors as age or lack of income.

Camping and "roughing it" was indicated as a good vacation by 97 householders. One-third of this group actually went camping, one-third did not take vacations and the remaining third participated in other activities.

Participation in sports activities was mentioned by 87 homemakers as a good vacation. Of this group, 28 did not take vacations, 36 actually participated in sports activities and the remainder indicated other activities.

Fishing was mentioned specifically by 60 respondents as a good vacation. Of this group, 25 households did not take vacations and 21 actually went fishing.

Of the remaining households, 213 did not answer the question regarding a good vacation or did not take vacations and 135 households indicated a variety of other activities as their concept of a good vacation.

Several situations emerge from the above discussion. Over one-third of the respondents consider travel to more than one location as a good vacation. Another 20 percent are attracted by either salt or fresh water. In no instance did over one-half of the respondents actually participate in those activities which they conceived of as a "good" vacation. The disparity was especially noticeable between travel to specific locations within the U. S. or to foreign countries and actual participation. The above patterns suggest that there is a repressed demand for many kinds of outdoor recreation activities. Prices in some instances may prevent the demand from becoming effective - but others are not expressed because of travel time and distance, job commitments, family composition, etc. For several reasons consumers may be on a demand curve but not at the present supply-demand intersection.

CHAPTER V

POLICY IMPLICATIONS

Potential Impact of Consumer Preferences for Outdoor Recreation Activities on the Use of Natural Resources in the Urban Fringe and Rural Areas

One means of assessing the future impact of consumer preferences for outdoor recreation activities is to first consider the magnitude of the demand for a particular activity and next to determine whether the private or public sector of the economy is likely to provide the facility. From the projections in Table 14, it may be observed that three activities account for the majority of the participation. These are pleasure rides, pleasure walks and swimming.

Pleasure rides: This study indicates that over 80 percent of the households in the sample participate in pleasure rides. Aggregate participation is estimated to increase by 60 percent between 1970 and 1980. The popularity of this activity and the projected rate of increase suggest that in the public interest there are opportunities for farmers and rural resource owners to create or improve the enviornment in which the rides take. The majority of the participants in this study live in urban areas but prefer to take their rides in rural areas. The scenery and other features of the rural areas apparently cause the participants to seek the rural environment.

It has been the function of government to provide the highways and/or secondary roads upon which the rides take place. High speed highways in the Interstate System are likely to be incompatible with leisurely pleasure rides judging from the rate of travel for participants in this study. Therefore, the traffic burden is likely to fall on the secondary roads which border farms and otherwise pass through rural areas. In this case the responsibility lies with the rural land owner to maintain a suitable environment. Strip development along the roads through sales of housing lots and the erection of billboards, etc. may destroy the attractiveness of a rural area in the minds of the urban participants. Although the private land owner could benefit from capital gains on the land sales, society would stand to lose most or all of the benefits derived from the pleasure rides.

Consumer preferences for a rural environment raises policy questions regarding the maintenance of such an environment. Although placing a value on maintaining a rural environment in a rapidly urbanizing area appears to be difficult, it becomes the task of society to establish priorities using policy goals. The need for a policy regarding such a land use arises if the society's values concerning quality of environment are different from its beliefs about the direction current land use is taking. Beliefs are factual statements about present conditions while values relate to how conditions ought to be.

While there appears to be relatively few, if any, opportunities for rural landowners to "market" their scenery directly, it is possible that they may be compensated for maintaining this setting. If the marginal benefits to society (participants in pleasure rides) exceed the private benefits (marginal revenue) obtained by the landowner for agricultural pursuits there may be cause for subsidization of the landowner to keep the land in agricultural use. This might take the form of reduced tax rates on the land or assessing the land at a value lower than the current market price. Maryland and New Jersey have recently enacted legislation which lowers the assessed value of land used for agricultural purposes. In the above two cases,referendum voters, the majority of whom live in urban areas, apparently decided that some subsidization was justified to maintain land in agricultural uses.

Farm owners and managers could also reap additional private benefits if pleasure ride participants were attracted to scenic roads which passed their farmstead. Fresh produce could be retailed at roadside markets as a means of increasing farm income. A retail operation would not be compatible with a limited access high speed highway, however.

Resource owners as a group through a farm organization, etc. could conceivably map out a route through a scenic rural area and provide road markers to guide the participants. This technique could also expose the pleasure ride participants to locations of

vacation farms. The fact that 26 percent of the sample households indicated they would be interested in taking a farm vacation warrants further exploration. The guided tour might be one method of advertising to potential farm vacationers.

Swimming: Swimming is an activity expected to be among the fastest growing in terms of per capita participation. Total participation is projected to increase by 65 percent between 1970 and 1980 for households in the sample area. Two types of facilities appear dominant based upon present use. These are ocean beaches and swimming pools. Participation at the two accounted for over three-fourths of the total per capita swimming participation and was found to be a positive function of income. The two facilities have been described previously as resource based (ocean) and user oriented (swimming pools).

The projected increase in swimming participation together with the complaints received from swimmers in this study point to a need for doubling the efforts over the next 15 years to provide for new facilities and better maintain presently developed beaches and pools.

Ocean and bay beaches and related areas appear to be among the most valuable natural resources for attracting outdoor recreationists according to the participation rates in this study. From the viewpoint of societal welfare, these resources need to be carefully managed under public ownership in order to maintain and insure their accessibility in the future.

One conclusion may be drawn relative to salt water swimming at the ocean compared to bays in the sample area. Bay swimming appears to be in the category of an inferior good since participation goes down as income increases. Participation in ocean swimming is positively related to income. This poses a policy question concerning the allocation of funds for developing and maintaining coastal areas. If the above relationship continues, as real consumer income increases, there should be a decrease for beaches along the bays and an increase in the demand for ocean beaches. From a social welfare viewpoint, the use of tax dollars may be desirable to maintain beaches along the bays for those low income persons who cannot afford to drive the necessary distance to reach the ocean beaches in the future.

Comments received from the questionnaire suggest that present beach facilities are not being properly maintained in accordance with consumer expectations. Insufficient maintainence labor is being utilized in relation to the level of use that the beaches are receiving. Societal welfare is reduced by those consumers who litter the beaches. Because of this condition, it appears that more personnel should be employed to maintain the present beach facilities along the coastal areas. These persons should either police the beach areas to prevent the littering or engage in clean-up operations after the littering has occurred.

Not only is there a need for added personnel to maintain present beach facilities but employment opportunities are evident as beach facilities are improved and expanded over the next 10 to 15 years to keep pace with the growing demand. Farmers and rural youth who reside near the beachlands might be the logical persons to consider as part of the personnel for beach maintenance.

The extent of participation in swimming at pools together with the comments on crowded pool conditions and requests for additional pools suggest the need for increased efforts in providing these facilities near urban areas. Since these are likely to be day use facilities and children are the most frequent participators, this is also suggestive of the need to provide the pools near to the urban centers of population. Although the burden is likely to be placed on local governments or private groups to finance these facilities, farm owners who are adjacent to urban or suburban areas might potentially provide pools, ponds or artifical lakes on their property where land and water resources are available.

Pleasure walks and hikes: Although about half of the households participate in pleasure walks and the average frequency of participation is the highest of any activity in the study, most of these walks originate at home. Those that originate away from home may be better classified as hikes on nature trails, etc. As a result of these patterns of participation, the provision of an environment in which the walks take place may largely rest with local governments through multiple use of parklands, etc. Future participation

may depend partially on the safety of the parkland surroundings. Participants mentioned fear for the safety as a factor when discussing the facilities desired in their locality. Societal welfare may be increased by adding to the number of police employed to protect the participants and to maintain a safe environment.

The remaining outdoor recreation activities, while less important in terms of projected total days of participation, need to be scrutinized for potential involvement by private landowners.

Picnicking: In the sample, over 50 percent of the participants picnicked at public parks and the remainder on private property. The average distance traveled to the picnic area was 14 miles. This suggests that at the present time, facilities are located relatively close to the place of residence of the participants. There may be opportunities for private individuals to provide picnic grounds on a fee basis. However, caution should be employed in any attempt to compete with public facilities where no fee is charged and where the facility is supported by tax revenues. Perhaps opportunities are greater in enterprises where users are accustomed to paying a fee.

Boating: The majority of the boating enthusiasts used the bays in the sample area in contrast to lakes, rivers or the ocean. There are development possibilities for those rural landowners who are located on or have access to the extensive shoreline around the Chesapeake Bay and to a lesser degree the Delaware Bay. Access may

be available to navigable waterways or through man-made channels. Lands which are marginal or unusable for agricultural purposes, but which are located in sheltered shoreline areas may offer potential for marina development. Boat dockage, gasoline sales and other services and off-season storage are related enterprises.

Fishing: Nearly 60 percent of the participating households fished in salt water - either the ocean or bays - where there is free access and no license is required. Only six households reported fishing at a private location where a fee was charged. However, 293 households reported a willingness to pay to fish with daily fees ranging from 25 cents to $20 per person. Thus a closer analysis of consumer attitudes toward paying to fish appears to be necessary before recommending that private individuals consider a fee-fishing enterprise. The purpose of this study was to investigate factors associated with fishing. Fishermen need to be questioned regarding species of fish they prefer, etc.

Golfing: In this study, 69 percent of the participating households reported that their golfers used a course owned by a private individual but which was open to the public with a daily fee, or a publicly owned course. The remainder golfed at country clubs requiring membership or at a combination of facilities. It would appear that courses providing public access play an important role in the sample area. Since golf courses are within the user-oriented category, they should be located near to the metropolitan population centers.

Golf courses could conceivably use either prime agricultural land or marginal land with a rolling topography. Farm owners near to metropolitan complexes may find opportunities to convert all or part of their land holdings into a golf course. As reported in Chapter IV, golfing is more likely among urban residents than among farm residents and is an increasing function of income. Also respondents mentioned a need for more golf courses at the present time. The fact that the average golfer in the study participates over 21 times annually is of importance to the potential golf course owner. If he is able to develop a facility and a steady clientele, he can be assured that the golfer will participate once every two to three weeks as compared to other activities where participation is less frequent. Thus, as real incomes increase and as a greater portion of the population is urbanized, the potential for golf courses should increase.

Hunting: The rural landowner - both farmer and non-farmer - and the state and federal agencies that manage the supply of game will likely determine the future direction that hunting participation will take. The ORRRC studies have indicated that per capita participation in hunting will decline in future years. The findings of this study tend to verify this prediction, i.e. hunting is more likely among farm residents than among non-farm residents. The problem of obtaining access to lands suitable for hunting and the desire to hunt on the part of the individual appear to be important variables. Other studies are concerned with a detailed

investigation of the individual's background to determine what factors generate a desire to hunt.[1/]

Among the hunting participants in this study, about one-half hunted on private lands and one-half on public lands. Although only eight households reported paying a daily fee to hunt, 81 households or 35 percent of the hunting participants reported a willingness to pay for hunting privileges. The daily fees being paid ranged from $1 to $20 per day. It is probably that several levels of services are implied in the range of figures. The level of services offered may range from providing access to the land to providing a shooting preserve stocked with game and where a minimum daily supply of game is guaranteed. Also, food and lodging may be provided for the hunter as part of the daily fee.

The type of land required for hunting will vary depending on the species of game preferred by the hunters. Studies are underway in the northeast to ascertain hunting preferences.[2/] Marshlands for waterfowl, and wooded and prime agricultural lands for other species of game may all be provided by the farm landowner. Hunting may be a supplementary enterprise to farmers who grow cash grain crops. Wildlife may consume grain which is lost in the process of mechanically harvesting the crops. Thus the farmer without incurring

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1/ A hunting study is being conducted under the direction of Dr. K. D. McIntosh at the West Virginia Experiment Station.

2/ A regional project, NEM-35 entitled "Consumer Analysis of Specific Forest-Oriented Recreational Activities in the Northeast" is concerned with this topic.

additional investment, except perhaps for a newspaper advertisement, could increase his total income. This could be done by charging daily fees to individual hunters or by leasing the farm to a group of hunters for the season. The potential for these two alternatives needs to be explored more fully. The feasibility of shooting preserves is being investigated at the present time in a U.S.D.A. study.

Camping: As described in Chapter IV, camping appears to be a resource-based activity located near water and/or in the mountains. Thus the potential for providing future facilities tends to lie with that group of landowners who are close to the ocean, bays or an inland body of water. The alternative uses for these lands may be quite different than for those adjacent to major metropolitan areas. The opportunity costs for both land and human resources may be less in areas suitable for campground development than in areas near major cities. The areas which may be most suitable for campgrounds are those which may be presently lying idle, eg. wooded areas on farms.

Camping participants are most likely to be young family groups according to the results from this study. It would appear that potential campground owners should plan for facilities oriented towards these groups and make provisions for young children. Other studies are underway to determine the facilities desired by campers and to estimate the benefits received using the Clawson techniques.[3/]

3/ The Delaware Experiment Station is conducting a camping study as a contributing project to NEM-35.

The feasibility of private campground development in the sample area will depend in part on the actions taken by federal and state agencies charged with administering public recreation facilities. In a market situation where a private campground owner must compete with a nearby public campground, the same or very similar fee is likely to be charged for the same services offered. In this study there was no significant difference between the fees charged at the two types of campgrounds. The public campground may be financed with tax dollars in addition to user fees unless the facility is on a pay-as-you-go basis. Under these circumstances non-campers are subsidizing campers who represented 14 percent of the households in this study. If a subsidy is in effect then there may be a tendency to price the camping services at below their cost of production with the non-campers helping to make up the difference. If the costs of providing the facilities are the same for the private and public campgrounds then the private campground owner may find it difficult to cover his total costs when charging a fee similar to the public campground. He may find it necessary to resort to non-price competition. By offering extra services, such as taking reservations and allowing pets, for which the marginal costs are close to zero, the private owner may successfully compete with the public campgrounds.

In instances where public land resources are lacking there may be cause to subsidize the private landowner for the development and operation of campgrounds. The source of these funds could either

be through the U.S.D.A. Cropland Adjustment Program where farmers are paid to convert their land to recreational uses or through a grant from the state government.

A factor related to camping which merits additional investigation is the relationship between participation and household income. The ORRRC studies cited earlier found a positive relationship between participation and income. In this study the income coefficient was negative but not statistically significant at the .10 level. It is possible that camping is used by some participants as an inexpensive means of providing sleeping accommodations. If the negative relationship between participation and income is valid, there may be a tendency to substitute a motel or hotel room for the camping experience as income increases. If so, then the increase in camping participation will be less than that projected in the ORRRC studies as real incomes increase in the future. Opportunities for providing new campgrounds may likewise be diminished.

Horseback riding: The majority of the horseback riders in this study travel less than 25 miles to participate and these persons are primarily children. This is suggestive of the need to provide for future facilities which are near to the potential users. That is, since families do not usually participate as a group, there may be problems in transporting the children from their homes to the horseback riding facilities.

Farm owners who are within 10-15 miles of the urban or suburban areas in the sample may find opportunities for converting

either part or all of their land and buildings into riding trails and a stable. Idle farm buildings could be converted into horse barns as a source of supplemental income in conjunction with a commercial farm. Land which is marginal for agricultural purposes could provide the base for riding trails.

Winter activities: Ice skating, like horseback riding above, is largely an activity for children according to the results from this study. Present participants are accustomed to having the facilities located close to their homes as discussed in Chapter IV. There is currently a need for more ice skating ponds according to the respondents and based on the projected increase in participation.

Ice skating ponds may be a logical part of multiple use of public parklands in areas which are within 1-2 miles of potential skaters. Private land owners who are also within short distances of potential participants might consider a skating area on an artificial lake or pond which is used for swimming during the summer. However, in the sample area sufficiently cold winter temperatures may be the limiting factor in providing outdoor skating areas. A more suitable alternative may be to use tax dollars to provide for indoor ice skating rinks which may be utilized the year-round.

There do not appear to be measurable opportunities for providing skiing and tobogganing facilities in the sample area in the near future. Topography and climate are the limiting factors under present technology.

Vacations and weekend trips: The potential for vacation and weekend facilities is related to the foregoing discussion of individual activities. Participants in the sample area are attracted to the salt water beaches for swimming and other water based activities for day use, weekend trips and for vacation trips. Salt water beaches stand out as the leading resource-based facility in the area. About eight percent of the vacationers report making at least one trip to ocean beaches. Assuming that this rate continues, approximately 990,000 persons from the sample area would vacation at ocean beaches in 1970 and about 1.5 million persons in 1980 based on the population data in Table 11. But, this is only a part of the demand for vacation facilities (hotels, motels, restaurants and related services), at the ocean beaches. This study does not include those persons who live outside of the sample area but who vacation at ocean beaches or other facilities in the area.

Vacation trips to states outside the sample region were reported by 60 percent of the 1,069 vacationing households. In terms of the ideal vacation and actual vacation activities, traveling and sightseeing ranked first and second respectively according to the results from this study. Nearly one-fourth (404) of the households in the study took two or more vacation trips. For these trips the provision of facilities lies with other regions of the U. S. or foreign countries. This is illustrative of the mobility and affluence of U. S. consumers. Based upon the current

patterns of participation on vacations, the provision of facilities may be primarily related to hotels, motels, restaurants and gasoline stations at locations near scenic and/or historical attractions and along the highways leading to these attractions.

If vacationers from other regions who travel to the sample area prefer to sightsee to the extent of sample households, then farm owners and other rural resource owners are not likely to benefit from the vacationers to the degree that businessmen in urban centers will benefit. For example if a vacationer travels to Washington, D. C. specifically to sightsee within the capital city, hotel and restaurant owners and other tourist shops may receive the bulk of the consumer expenditures.

If the outside vacationer travels to the ocean beaches within the sample area there may be a different pattern of expenditures. For example if the vacationer brings a boat with him or is a camper, then farmers who have marinas and/or campgrounds are likely to receive a greater part of the vacationer's expenditures than would be the case in the Washington, D. C. example.

Weekend trip participation patterns are similar to vacation trips for sample households. While the distances traveled on weekend trips are less than for vacation trips due to time limitations, sightseeing is the preferred activity next to relaxing. Nearly 30 percent of the reported weekend trips were taken to states outside of the sample area, while one-third of the participating households reported taking trips to beaches within the sample area. The

relatively high degree of mobility as indicated by the number of weekend trips taken and the distances traveled together with the activity preferences suggest that recreation business owners who are near to resource-based facilities such as ocean beaches or historical attractions, will be in the best position to benefit from weekend trip expenditures similar to the vacation expenditures.

Summary of resource use potential: The individual outdoor recreation activities have been discussed in relation to the projected participation for each activity. Development potential for the provision of new facilities by private individuals has been discussed in a general manner out of necessity. Until the total costs for providing the respective facilities are known and until the benefits derived for the activities may be estimated, an equilibrium solution cannot be obtained.

Those individuals who have the management ability, the interest and the available capital and are located adjacent to an urban area, should investigate the potential for swimming facilities (pools, ponds or man-made lakes) and for golf courses, ranked in that order. The ranking is made on the basis of the projected participation in the two activities for 1970 and 1980 and on the basis of consumer reports of needed facilities cited in Chapter IV. Providing riding stables and trails may be an alternative for those resource owners who are unable to finance a swimming facility or a golf course or find the demand lacking. Conversion of present buildings may reduce the capital outlay required.

Resource owners should be aware that the opportunity costs will likely be higher for their land and management skills in areas adjacent to a city than in more remote rural areas. The recreation enterprise will be in competition with other potential users such as residential and industrial developers. Optimum resource allocation dictates that the land be used for that purpose which will yield the highest rate of return. Society may decide to alter the allocation procedure as was described in the case of providing scenery for pleasure rides, i.e. through subsidizing the resource owners, or the persons within the municipality may prefer that the facilities be provided under public ownership. The potential recreation enterprise owner should investigate these alternatives before committing his available capital and other resources to a new venture.

Farmers who are located within one to two hours driving time of the metropolitan areas should investigate the possibility of selling the right to hunt on their property as a means of supplemental income or under a more intensive management program, investigate the potential of a shooting preserve. The problem of access to hunting land appears to be a major factor influencing future participation in hunting.

Landowners located adjacent to or within miles of ocean beaches or the bays in the sample areas should investigate the potential for marinas and campgrounds. Both facilities are likely

to require sizeable investments. Competition from public facilities should be noted especially in the case of campgrounds.

Off-farm employment opportunities are likely to be the greatest in beach areas if facilities are expanded to the extent suggested in this study.

Alternative Uses of Publicly Owned Land and the Impact on Private Enterprise

The use that federal, state or local governments make of recreation lands can have an impact on the potential for private recreational development including land use and employment opportunities. One example will be used to illustrate this point. Delaware has approximately 23 miles of ocean beaches.[4/] Of this total, about 12 miles are controlled by either the State Park Commission or the State Highway Commission for public use. Another four miles of beach is owned by municipalities and public access is provided. The remainder is owned by private developers or individuals for summer homes and motels. Present use of the privately owned land is determined. However, there are several alternatives facing the state concerning use of the land it owns. One alternative is to sell the land to private individuals. Another is to develop the beach lands into public campgrounds. Or, the lands may be developed and maintained as beaches for day use with adjacent parking lots. Finally, the state might choose some combination of the above three

4/ Based upon measurements from the 1966 Delaware Highway Map.

alternatives. Societal goals must be determined before a course of action can be taken.

Consumer preferences for ocean swimming and comments regarding development of more beach facilities suggest that from the standpoint of societal welfare the Delaware beachlands should remain in public ownership to guarantee access to the greatest number of persons. Allowing the lands to fall into private ownership for houses or using the lands for other facilities such as campgrounds, will tend to limit access to swimmers who are greater in number than campers or other outdoor recreation participants.

The results of this study indicate that per capita ocean swimming rates are five times as great as those for camping. The average rates are influenced by the percentage of the sample population participating which is 50 percent for ocean swimming and 14 percent for camping. These facts provide a guideline in allocating resources for the two types of facilities but the final determinants will be the marginal costs of providing the facilities and the marginal benefits obtained by the users. The additional camping studies mentioned in Chapter IV which are now underway, will assist policy makers in determining the marginal benefits obtained from campgrounds near the beaches.

Thus, it may be argued that keeping the beachlands open to swimmers is likely to have a greater economic impact on the local economy than alternative land uses. This impact can take the form of recreation enterprises related to swimming, and services such

as motels, restaurants and private campgrounds which are located relatively near to the beach lands but not on the beaches. If the goal of the state's citizens is to provide economic growth over the long run rather than be concerned with short-run income, they should choose to retain the beach lands in public ownership and restrict the use to swimming in order to attract the greatest number of day users, vacationers and weekenders into the area.

CHAPTER VI

LIMITATIONS OF THE STUDY APPROACH AND SUGGESTIONS FOR NEEDED RESEARCH

This study was planned as a contribution to the estimation of demand for outdoor recreation activities by consumers in the sample region. While the Census of Business provides information on private outdoor recreation enterprises, the data are aggregated (to avoid disclosure of information on individual firms) with other amusement businesses. Thus the volume of business for specific types of outdoor recreation enterprises cannot be identified. It was hoped that a consumer questionnaire to derive participation rates would indicate the relative importance of the activities within the region and contribute to an estimation of the demand for such facilities.

Limitations of the Study Approach

As the study progressed, the dispersal and wide range in the use of facilities within and outside the region made it apparent that the limitations of this approach were more severe than had been expected. It may be useful, however, to point out some of the contributions that this study can make even though the specification of a statistical demand curve was not feasible.

The information obtained represents a series of individual purchases or recreational services at existing prices. There are individuals who do not participate at the present time for various

reasons. If their incomes are too low, the prices too high or if their preference patterns are geared to the consumption of alternative goods and services, then these individuals are not presently part of the effective demand in the same way that small boat owners do not form part of the effective demand for yachts. However, as was discussed in Chapter IV, questions were asked in the questionnaire in an effort to identify the existence of a pent-up demand, not presently expressed because of distaste engendered by crowded or dirty facilities, a distantly located facility when a closer location would be possible, or by other remediable limitations. The identification of such circumstances could provide an opportunity for new entrepreneurs who may be the owners of potential recreational sites, some of whom might be farmers.

At this point, some characteristics of outdoor recreational activities, as related to demand, should be noted. First, in aggregate terms, outdoor recreation may draw upon non-exhaustable resources such as air and sunshine as compared to exhaustable resources like coal and petroleum. Used this week, the resource is able to provide very similar services next week and the week after. The individual consumer, of course, can enjoy the facilities and return to them, but each occasion is an individual use experience requiring a separate expenditure.

Second, outdoor recreation facilities do depreciate and deteriorate over time with extensive use or with indifferent

maintenance. Some types of outdoor recreation press harder upon the resources than do others, with differing levels of investment and maintenance expenditures. For example, compare an intensively used beach area or municipal park with a wilderness nature trail which is scarcely used.

Third, certain recreation facilities are located at considerable distances from the potential consumers. Resource-based facilities, such as ocean beaches and campgrounds, cannot be located so as to maximize the convenience of the consumer. Other facilities such as swimming pools, playgrounds, etc. which are not dependent upon particular kinds of natural resources, should be located close to the potential consumer. Transportation costs will be less and the total cost of the recreational services will be lower. Both distance and time from the consumer's home to the facility were significant variables affecting participation in this study. The above characteristics are included to illustrate why some of the difficulties were encountered with the study approach in an attempt to measure demand.

The data in Chapter IV and the projections developed from the data are for current participation in outdoor recreation activities. These data do not generate a statistical demand function for individual activities. The reason for not generating a statistical market demand curve is that the data are not such that is is possible to relate quantity used to price of individual recreational goods and services. In other words, the relation $Q = f(P)$ is not measured.

Price data are not readily available because many of the services are not paid for directly. Rather, all taxpayers may provide for a public recreation facility. Thus many of the recreation services have free access, i.e. ocean beaches, fishing and boating sites, etc.

Attempts were made to obtain price data for hunting and fishing but so few of the participants were paying a fee that no conclusive results could be obtained. Travel cost as related to driving distance was used as a proxy for price for ocean beach visits in accordance with the Clawson technique cited in Chapter II, but significant results were not obtained.

Since the participation data are related to the current supply of outdoor recreation facilities, demand preferences are not expressed by those individuals who have the necessary income and would otherwise be able to participate in an activity, but who are prevented from doing so because of the absence of a convenient facility. The total absence of a facility or the lack of a facility within a distance which makes day or weekend use possible are related problems since they both tend to prevent consumer demand from being expressed. For example, the lack of sufficient swimming pools, lakes, horseback riding facilities and slopes for snow skiing may cause the participant rates to be lower than the actual demand would indicate if the market demand schedules for these activities were known. The fact that consumers in this study expressed a desire

and willingness to pay for more convenient water-based recreation facilities, golf courses and parklands indicates that a pent-up demand does exist.

Another source of demand which cannot be measured by the participation data from the sample is from those persons who reside outside of the sample area, but who travel to locations within the sample area for vacation and/or weekend trips. It is assumed that major attractions in the sample area would be of a scenic or resource based nature for which no alternatives exist at a location closer to the participants from outside of the sample area. Ocean beaches and the associated outdoor recreation services would be included in this category. It is also recognized that other sources such as the scenic, historical, and governmental attractions in Washington, D. C. and environs are important in the non-rural and indoor recreation area. Perhaps the combination of outdoor recreation facilities (ocean beaches) and the Washington, D. C. attractions are complementary in attracting vacationers to the sample region.

The fact that a pent-up demand appears to exist among consumers in the sample area and the potential influx of tourists from outside the sample area both suggest that the participation data tend to underestimate the demand that exists at present market prices for outdoor recreation facilities in the region. Thus, although the level of demand for each activity may not be determined, some guidelines are indicated in Chapter IV for potential investors with the recognition that these may be too conservative.

It should also be recognized that an independently measurable demand does not exist for some outdoor recreation activities for which consumers have had no prior experience or background knowledge with which to establish a set of preferences. Such activities might include snow skiing or horseback riding, to mention only two. The only way in which demand may be determined for such activities is through a program of market testing in a manner similar to the way in which new consumer products are introduced into a supermarket. However, just as all new products do not gain consumer acceptance, it is probable that not all outdoor recreation facilities will be accepted or attract enough customers to make a profit. Therefore, a market testing program may remove part of the uncertainty associated with investing in a recreation facility. Testing will require promotional or advertising expenditures in order to make consumers aware of the services which are available. Recognition of the need for testing and advertising should be made by persons contemplating investment in recreation businesses and by private or governmental credit institutions assisting in the financing of the farm recreation business. This includes lending policies which are formulated by the Farmers Home Administration.

Suggestions for Needed Research

The limitations noted for the approach used in this study due to the problems which have been discussed, lead to suggestions

for needed research which will improve the level of knowledge concerning the supply and demand for outdoor recreation activities.

One means of improving outdoor recreation research methodology would be to define what comprises a market for a given outdoor recreation activity or group of activities. For example, is a market for campgrounds composed of alternative types of campgrounds with respect to facilities and services offered but which are located within a compact region or is a market made up of similar types of campgrounds spread across more than one region of the country? Since campers are distributed on a geographic basis in some relationship to the total population, it would appear that defining camping markets would be useful in planning for future needs of campers. A similar approach should be taken for determining markets for other outdoor recreation activities. Because of the nature of the resources involved and based on the findings from this study, it is hypothesized that markets for facilities which rely on outstanding natural resources will cover a wider geographic area than will markets for user-oriented facilities.

If the market areas are defined, the next step would be to determine the characteristics of the consumers in those markets. However, to by-pass the shortcomings of this study, it would be necessary to study both participants and non-participants and possibly institute a program of market testing by offering some recreation services which have been previously unknown in a market

area to fully ascertain the potential market demand. Perhaps observing consumer reaction for snow skiing facilities, to use an example, by asking how many days of skiing they would demand at alternative prices, after introducing potential consumers to skiing through market testing would result in a more accurate demand estimate than only where participation data are used.

These data should offer potential suppliers of facilities a stronger base for decision making, also. Supplying new facilities in response to a demand which is known to exist will result in better allocation of rural resources.

Assuming that the above market testing and exploratory demand approach is feasible, and testable results are obtained, the next phase would involve the developing of price and income elasticity coefficients to measure consumer response and cross elasticity coefficients to measure the degree of substitutability or complementarity between outdoor recreation activities. When the level of knowledge approaches this point, the measurement of demand for outdoor recreation may be on a more comparable basis with demand measurement for agricultural commodities. The initial step in reaching this level of sophistication should involve a sharpening of the definition of a market with the attendant research methodology which has been outlined.

CHAPTER VII

SUMMARY AND CONCLUSIONS

This study was conducted to determine the current level of demand for outdoor recreation activities in the Philadelphia-Baltimore-Washington Metropolitan Region. Aggregate participation for individual activities was based on 1963-64 participation rates for 1,718 sample households, and projections were made for 1970 and 1980. The projections were made as a basis for determining the potential for farm owners and operators to either enter the outdoor recreation business or to be employed full or part-time in a recreation enterprise.

Hypotheses which were developed for testing include: (1) participation in outdoor recreation activities is related to driving distance and time; (2) participation in outdoor recreation activities is related to socio-economic characteristics of a household; and (3) participation in outdoor recreation is related to family units.

Hypothesis (1) was accepted for all activities. The multiple regression analysis indicated a significant relationship between participation and the distance traveled and time required for travel to the point of participation. However, two relationship patterns emerged. For pleasure rides, ocean swimming, bay swimming, boating and camping, participation was a positive function of both distance and time. For picnicking, pleasure walks, swimming at a pool,

fishing, hunting, golfing, horseback riding, ice skating, tobogganing and snow skiing, participation was found to be a negative function of the distance traveled and a positive function of the time required.

Outdoor recreation activities in the first group are largely in Clawson's resource-based category. Persons in this study on the average travel distances greater than 50 miles to participate because the population is concentrated in urban areas while the resources are along the coastal areas or in the mountains. Hence, those persons who desire to participate must drive the distance noted. Likewise, the expenditure of time is positively related to participation because of the distance involved as compared to the non-participants clustered in the metropolitan areas.

Activities in the second group are primarily of a user-oriented nature rather than resource based. Thus, potential participants in this study travel distances of less than 25 miles on the average to participate. As a result of the location of facilities in relation to the potential participants and possibly because participants are unwilling to drive greater distances, participation is a negative function of the distance traveled. Time may be related to participation in a positive manner because it is proportionally greater than the distance traveled. Most participants live in urban areas where speed limits are lower and where traffic congestion may be greater than in rural areas. For those persons who have the desire

Hypothesis (2) was accepted in part. The socio-economic variables included for analysis were: presence of physical handicaps, farm or non-farm residence, household size, age of homemaker, race, educational level, occupation and household income.

The sub-part of hypothesis (2) relating to physical handicaps was accepted for picnicking, swimming, ice skating and vacation and weekend trips, since there was a significant relationship between participation in these activities and physical handicaps; handicaps acted as a deterrent to participation. Place of residence was significantly related to participation in pleasure walks, golfing and hunting, but the sub-part of hypothesis (2) was rejected for the remaining activities since no significant relationship was found. Urban residents are more likely to take walks and to golf, while farm residents are more likely to hunt than are urban residents.

Participation was found to be positively related to household size for swimming, picnicking, pleasure rides, walking, fishing and camping; hence the sub-part of hypothesis (2) relating to household size was accepted for these activities but rejected for the remainder.

Participation in swimming, pleasure rides, picnicking and hunting was found to be a decreasing function of age; but the sub-part of hypothesis (2) was rejected for the remaining activities since no significant relationships were found.

Non-whites were less likely to participate in swimming, golfing and ice skating while no significant relationship was found between race and participation in the remaining activities.

Participation in boating and hunting was found to be more likely among blue collar workers than among professionals, while participation in swimming at pools and weekend trips is more likely among professionals. The sub-part of hypothesis (2) relation to occupation was rejected for the remaining activities.

Participation was found to be more likely as income increases for pleasure rides, ocean and pool swimming, walking, boating, ice skating, golfing, horseback riding, tobogganing, skiing and vacation and weekend trips. Participation was found to decrease as income increases for picnicking, fishing, bay swimming and camping. However, the income coefficient was not significant at the .10 level for pleasure rides, picnicking, walks, ocean swimming, boating, camping, hunting and tobogganing. The income variable was retained for explanatory purposes however.

Hypothesis (3) was rejected for the following activities: horseback riding, ice skating, hunting, fishing and golfing. For the first two activities, children are the primary participators while for the last three activities heads of households are the usual participators. For the remaining activities the entire household usually participated in the activities.

Results from the multiple regression analysis indicated that not all the relevant variables relating to participation were specified. R^2 values in general were less than .50. Thus additional research is needed to explore new functional relationships which

will improve the percentage of variation in the dependent variable explained by variation in the independent variables.

Based upon current participation in outdoor recreation activities in the Philadelphia-Baltimore-Washington area and projected participation for 1970 and 1980, there appears to be opportunities for farm landowners to enter the outdoor recreation business. Caution should be employed however in interpreting these opportunities. Eighty percent of the total days of participation are accounted for by pleasure drives, pleasure walks and swimming. The farmer probably cannot benefit directly from pleasure rides and walks. He may be compensated by society through preferential tax treatment or other subsidies to maintain a rural environment in which these rides and walks take place.

Activities showing the most rapid increase in per capita participation are swimming, camping and ice skating. However, the primary participators in ice skating are children and present facilities are located within five miles of their homes. Thus the potential does not appear to be as great for private landowners to provide an ice skating facility as for swimming or camping.

Landowners who are adjacent to the metropolitan area may find the provision of swimming facilities, golf courses and riding stables among the more favorable alternatives based upon patterns of participation and expected increases in participation rates. The provision of horseback riding facilities is an alternative that

probably would require a smaller investment if unused buildings could be converted into the new use.

Farmers who are within one to two hours driving time from the metropolitan centers should investigate the potential for selling hunting rights on their farms if hunting is compatible with their farm enterprises.

Landowners who are near to the ocean, bays or inland bodies of water should investigate the potential for marinas and campgrounds which probably will take sizeable investments and compete with the available labor supply during the summer months.

Public ownership of ocean and bay beachlands in the sample region appears to be the most acceptable alternative in view of the expected doubling in swimming participation over the next 15 years and due to the complaints and preferences expressed by respondents in this study. There is evidence that a pent-up demand exists among sample householders. Public ownership will insure access to the greatest number of persons.

While the participation data provide an indication of current levels of activity, these data do not generate statistical demand functions for each activity. The information represents a series of individual purchases at existing prices. Those persons who would like to participate in an activity and are able to participate, but who are prevented from doing so by the lack of a convenient facility are excluded from the participation figures. Participation is geared to the present supply of facilities. Also,

persons who reside outside of the sample region but who participate in activities within the region are excluded.

Evidence for the existence of a pent-up demand for facilities, together with the exclusion of non-sample area residents, suggests that the participation data may be too conservative in estimating current and future participation at present market prices.

Market testing programs to offer new facilities to consumers are a possible means of developing a demand for such activities as horseback riding, where an independently measurable demand did not previously exist. Market testing is also a technique for reducing part of the investment risk and uncertainty faced by the potential outdoor recreation entrepreneur.

The limitations and shortcomings of the approach used in this study suggest possibilities for future research. Defining market areas for outdoor recreation activities or groups of activities is an alternative approach. Studying both the current participants and non-participants would by-pass some of the shortcomings of this study.

The next step should be concerned with the development of price and income elasticity coefficients to measure the appropriate consumer response and cross elasticity coefficients to measure substitutability or complementarity between outdoor recreation activities. The measurement of demand for outdoor recreation will then be on a more comparable basis with demand measurement for agricultural commodities.

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APPENDIX A - CONSUMER QUESTIONNAIRE

1. During the past 12 months, did your household members go picnicking?
   Yes /_/ No /_/- (Go to qu. 2)

   IF YES: Please answer the following questions about your household's picnicking during the past 12 months.

   a) Which of your household members went on these picnics?
      Male head of household /_/ Homemaker /_/ Child(ren) /_/
      Other household member(s) /_/

   b) About how many times did your household members go picnicking during the past 12 months?
      About _____ times

   c) Where did your household members go on these picnics? (If more than one place, indicate the place you most often picnicked by putting a "1" in the answer box for that place; a "2" in the answer box for the place you next often picnicked.)
      City Park /_/ State Park /_/ Private Park /_/
      County Park /_/ National Park /_/ Other Place /_/

   d) Going one way - about how far from your home are the picnic spots where you most often picnicked and next often picnicked (as designated in part "c")?
      Most often picnicked - ONE WAY: About _____ mile(s) from home
      Next often picnicked - ONE WAY: About _____ mile(s) from home

   e) About how long does it take to travel one way to each of these picnic spots?
      Most often picnicked - ONE WAY: About _____ hour(s) or About _____ minutes
      Next often picnicked - ONE WAY: About _____ hour(s) or About _____ minutes

   f) In what state is the spot where your household most often went picnicking?
      Delaware /_/ District of Columbia /_/ Maryland /_/
      New Jersey /_/ New York /_/ Pennsylvania /_/
      Virginia /_/ West Virginia /_/ Other /_/

2. During the past 12 months, did anyone in your household go swimming, or to the beach?
Yes /_/ No /_/ - (Go to qu. 3)

IF YES: Please answer the following questions about your household members' swimming, or going to the beach, during the past 12 months.

FOR EACH OF THE SWIMMING & BEACH AREAS (listed across the page at the right, below) WHERE A HOUSEHOLD MEMBER(S) WENT SWIMMING, OR TO THE BEACH ...

	SWIMMING AND BEACH AREAS WHERE HOUSEHOLD MEMBERS MIGHT GO							
	Swimming Pool at Home	Swimming Pool Away From Home	Ocean	Bay	Lake	Pond	River	Other
a) Give the approximate number of DIFFERENT DAYS he (she) went there for swimming, or to the beach, during the past 12 months. (ANSWER FOR EACH WHO SWAM, ETC.)	- - - - - Number of Days - - - - -							
Male head of household .								
Homemaker								
Children								
Other household member(s)								
NOT including "Swimming pool at home", answer parts "b" & "c" for swimming/beach areas answered about above:	- - - Number of miles ONE WAY from your home - - -							
b) One way - about how far from your home is this place?	___ mi.	___ mi.	___ mi.	___ mi.	___ mi.	___ mi.	___ mi.	___ mi.
c) About how long does it take to travel one way to this place?	___ hrs. or ___ min.	___ hrs. or ___ min.	___ hrs. or ___ min.	___ hrs. or ___ min.	___ hrs. or ___ min.	___ hrs. or ___ min.	___ hrs. or ___ min.	___ hrs. or ___ min.

d) In what state did a household member(s) most often go swimming, or to the beach?
Delaware /_/ District of Columbia /_/ Maryland /_/ New Jersey /_/ New York /_/
Pennsylvania /_/ Virginia /_/ West Virginia /_/ Other /_/

3. During the past 12 months, did your household go camping? Yes /_/
No /_/- (Go to qu. 4)

IF YES: Please answer the following questions about your household's camping activity during the past 12 months.

a) Which household members went camping during the past 12 months?
Male head of household /_/ Homemaker /_/ Child(ren) /_/
Other household member(s) /_/

b) About how many times did your household go camping during the past 12 months?
About _____ times

c) What type of equipment did your household use? (Check all that apply)
Tent /_/ Trailer /_/ Station Wagon /_/ Other: _____

d) Where did your household **most** often go camping? (CHECK ONE)
County Park /_/ State Park /_/ National Park /_/
Privately Owned Campground /_/

e) Going one way - about how far from your home is this place?
ONE WAY: About _____ mile(s) from home

f) About how long does it take to travel one way to this place? (ANSWER IN ONE SPACE ONLY)
ONE WAY: About ____ hour(s) or About ____ minutes

g) What fee per day was charged to camp at this place?
FEE PER DAY: _____ dollars NOTHING /_/

h) How much would you, yourself, be willing to pay per day for a campsite similar to the one you most often used?
FEE PER DAY: _____ dollars Nothing /_/

i) In what State did your household most often camp?
Delaware /_/ District of Columbia /_/ Maryland /_/
New Jersey /_/ Pennsylvania /_/ Virginia /_/ New York /_/
West Virginia /_/ Other /_/

4. During the past 12 months, did anyone in your household go fishing?
Yes /_/ No /_/- (Go to qu. 5)

IF YES: Please answer the following questions about your household's fishing during the past 12 months.

a) Which of your household members went fishing during the past 12 months?
Male head of household /_/ Homemaker /_/ Child(ren) /_/
Other household member(s) /_/

b) On about how many different days during the past 12 months did a household member(s) go fishing?
On about _____ different days, during the past 12 months

c) Where did your household member(s) go to fish? (If more than one place, indicate the place where they most often fished by putting a "1" in the answer box for that place; a "2" in the answer box for the place they next often fished.)
Ocean /_/ Bay /_/ River /_/ Public Lake /_/ Other /_/
Privately owned lake or pond where a fee was charged to fish /_/
Privately owned lake or pond where a fee was not charged to fish /_/

d) Going one way - about how far from your home are the places where a household member(s) most often fished, and next often fished (as designated in part "c")?
Most often fished - ONE WAY: About ____ mile(s) from home
Next often fished - ONE WAY: About ____ mile(s) from home

e) About how long does it take to travel one way to each of these fishing spots?
Most often fished - ONE WAY: About ___hour(s) or about ___ min.
Next often fished - ONE WAY: About ___hour(s) or about ___ min.

IF FISHING WAS MOST OFTEN DONE AT A PRIVATELY OWNED LAKE OR POND:
(If not, go to part "g")

f) What fee per day PER PERSON was charged to fish at this place?
FEE PER PERSON per day: _____ dollars Nothing /_/

g) How much would members of your household be willing to pay per day PER PERSON to fish?

_____ dollars

h) Who, if anyone, usually accompanied your household member(s) to this place to fish?

Friends /_/ Business Associates /_/ Relatives /_/
No One /_/

i) In what state did your household member(s) most often fish?

Delaware /_/ District of Columbia /_/ Maryland /_/
New Jersey /_/ New York /_/ Pennsylvania /_/ Virginia /_/
West Virginia /_/ Other /_/

5. During the past 12 months, did anyone in your household go hunting (gunning)?

YES /_/ No /_/ - (Go to qu. 6)

IF YES: Please answer the following questions about your household's hunting activity during the past 12 months.

a) Which of your household members went hunting during the past 12 months?

Male head of household /_/ Homemaker /_/ Child(ren) /_/
Other household member(s) /_/

b) On about how many different days did a household member(s) go hunting during the past 12 months?

On about _____ different days, during the past 12 months

c) Where did your household member(s) most often go hunting? (CHECK ONE)

Public hunting area /_/ Private farm /_/ Private shooting preserve, where a fee was charged /_/

d) Going one way - about how far from your home is this place?

ONE WAY: About _____ mile(s)

e) About how long does it take to travel one way to this place?

ONE WAY: About _____ hour(s) or About _____ minutes

IF HUNTING WAS MOST OFTEN DONE AT A PRIVATE SHOOTING PRESERVE:
(If not, go to part "g")

f) What fee per day PER PERSON was charged to hunt at this place?
FEE per day PER PERSON: _____ dollars

g) How much would members of your household be willing to pay per day to hunt at a place similar to this place?
_____ dollars

h) Who, if anyone, usually accompanied your household member(s) to this place?
Friends /_/ Business Associates /_/ Relatives /_/
Other(s) /_/

i) In what state did your household member(s) most often go hunting?
Delaware /_/ District of Columbia /_/ Maryland /_/
New Jersey /_/ New York /_/ Pennsylvania /_/
Virginia /_/ West Virginia /_/ Other /_/

6. During the past 12 months, did anyone in your household go horseback riding?
Yes /_/ No /_/ - (Go to qu. 7)

IF YES: Please answer the following questions about your household's horseback riding activity during the past 12 months.

a) Which of your household members went horseback riding during the past 12 months?
Male head of household /_/ Homemaker /_/ Child(ren) /_/
Other household member(s) /_/

b) On about how many different days did a household member(s) go horseback riding during the past 12 months?
On about _____ different days, during the past 12 months

c) Where did your household member(s) most often go horseback riding? (CHECK ONE)
Public riding trail /_/ Private riding trail /_/ Other /_/

d) Going one way - about how far from your home is this place?

ONE WAY: About _____ mile(s)

e) About how long does it take to travel one way to this place?

ONE WAY: About _____ hour(s) or About _____ minutes

f) In what state did members of your household most often go horseback riding?

Delaware /_/ District of Columbia /_/ Maryland /_/
New Jersey /_/ New York /_/ Pennsylvania /_/ Virginia /_/
West Virginia /_/ Other /_/

7. During the past 12 months, in which of the water activities listed below, if any, did any member(s) of your household take part? (CHECK ALL THAT APPLY or "NONE")

Canoeing /_/ Sailing /_/ Other boating /_/ Water skiing /_/
None /_/ - (Go to qu. 8)

NOTE: Please answer the following questions about the water activity(ies) checked above:

a) During the past 12 months, which of your household members took part in one or more of the water activities listed above?

Male head of household /_/ Homemaker /_/ Child(ren) /_/
Other household member(s) /_/

b) On about how many different days during the past 12 months did a household member(s) take part in one or more of these water activities?

On about _____ different days, during the past 12 months

c) Where did your household member(s) most often go to take part in this water activity(ies)?

Ocean /_/ Bay /_/ River /_/ Stream /_/ Lake /_/ Pond /_/

d) Going one way - about how far from your home is this place?

ONE WAY: About _____ mile(s) from home

e) About how long does it take to travel one way to this place?

ONE WAY: About _____ hour(s) or About _____ minutes

f) Who, if anyone, usually accompained your household member(s) to this place?

Friends /_/ Business associates /_/ Relatives /_/ No One /_/

g) In what state did your household member(s) most often take part in water activity(ies)?

Delaware /_/ District of Columbia /_/ Maryland /_/
New Jersey /_/ New York /_/ Pennsylvania /_/ Virginia /_/
West Virginia /_/ Other /_/

8. During the past 12 months, did any member of your household take any hikes, nature walks, or walks for pleasure?

YES /_/ NO /_/ - (Go to qu. 9)

IF YES: Please answer the following questions about the hikes, nature walks, or walks for pleasure, taken by household members during the past 12 months.

a) Which of your household members went hiking, for nature walks, or walks for pleasure, during the past 12 months?

Male head of household /_/ Homemaker /_/ Child(ren) /_/
Other household member(s) /_/

b) On about how many different days during the past 12 months did a household member(s) go hiking (or for nature walks, etc)?

On about _____ different days, during the past 12 months

c) Where did your household member(s) most often go for a hike (or nature walk, or walk for pleasure)? CHECK ONE

Sidewalks near home /_/ - (Skip to qu. 9)
City, County, State or National Park /_/
Private lands away from home /_/

IF HIKE OR WALK MOST OFTEN ORIGINATED AWAY FROM HOME:

d) Going one way - about how far from your home did the hike or walk start?

ONE WAY: About _____ mile(s) from home

e) About how long does it take to travel one way to this place (where hikes started)?

ONE WAY: About _____ hour(s) or About _____ minutes

f) In what state is the place where your household member(s) most often went to hike (or for nature walks/walks for pleasure)?

Delaware /_/ District of Columbia /_/ Maryland /_/
New Jersey /_/ New York /_/ Pennsylvania /_/ Virginia /_/
West Virginia /_/ Other /_/

9. During the past 12 months, did any member of your household go golfing?

YES /_/ NO /_/- (Go to qu. 10)

IF YES: Please answer the following questions about your household's golfing during the past 12 months.

a) Which of your household members went golfing during the past 12 months?

Male head of household /_/ Homemaker /_/ Child(ren) /_/
Other household member(s) /_/

b) On about how many different days during the past 12 months did a household member(s) go golfing?

On about _____ different days, during the past 12 months

c) Where did your household member(s) most often go golfing? (CHECK ONE)

Public course owned by a city, county, etc. /_/
Private course owned by an individual charging a fee /_/
Private course requiring a membership /_/

d) Going one way - about how far from your home is this place?

ONE WAY: About _____ mile(s) from home

e) About how long does it take to travel one way to this place?

ONE WAY: About _____ hour(s) or About _____ minutes

f) Who, if anyone, usually accompanied your household members to this place to golf?

Friends /_/ Business associates /_/ Relatives /_/ No One /_/

g) In what state is the place where your household member(s) most often golfed?

Delaware /_/ District of Columbia /_/ Maryland /_/
New Jersey /_/ New York /_/ Pennsylvania /_/
Virginia /_/ West Virginia /_/ Other /_/

10. During the past 12 months, did any member of your household go snow skiing?

YES /_/ NO /_/ - (Go to qu. 11)

IF YES: Please answer the following questions about your household's snow skiing during the past 12 months.

a) Which of your household members went snow skiing during the past 12 months?

Male head of household /_/ Homemaker /_/ Child(ren) /_/
Other household member(s) /_/

b) On about how many different days during the past 12 months did a household member(s) go snow skiing?

On about _____ different days, during the past 12 months

c) Where did your household member(s) most often go snow skiing? (CHECK ONE)

Ski slope owned by a private individual /_/
Ski slope in a National or State Forest or Park /_/

d) Going one way - about how far from your home is this place?

ONE WAY: About _____ mile(s) from home

e) About how long does it take to travel one way to this place?

ONE WAY: About _____ hour(s) or About _____ minutes

f) Who, if anyone, usually accompanied your household member(s) to this place?

Friends /_/ Business Associates /_/ Relatives /_/ No One /_/

g) In what state did your household member(s) most often go snow skiing?

Delaware /_/ District of Columbia /_/ Maryland /_/
New Jersey /_/ New York /_/ Pennsylvania /_/
Virginia /_/ West Virginia /_/ Other /_/

11. During the past 12 months, did any of your household members go ice skating?

YES /_/ NO /_/ - (Go to qu. 12)

IF YES: Please answer the following questions about your household's ice skating during the past 12 months.

a) Which of your household members went ice skating during the past 12 months?

Male head of household /_/ Homemaker /_/ Child(ren) /_/
Other household member(s) /_/

b) On about how many different days during the past 12 months did a household member(s) go ice skating?

On about _____ different days, during the past 12 months

c) Where did your household member(s) most often go ice skating? (CHECK ONE)

Lake or pond in a public park /_/
Lake or pond NOT in a public park /_/
Indoor ice skating rink /_/ Other /_/

d) Going ONE WAY - about how far from your home is this place?

ONE WAY: About _____ mile(s) from home

e) About how long does it take to travel one way to this place?

ONE WAY: About _____ hour(s) or About _____ minutes

f) In what state did your household member(s) most often go ice skating?

Delaware /_/ District of Columbia /_/ Maryland /_/
New Jersey /_/ New York /_/ Pennsylvania /_/ Virginia /_/
West Virginia /_/

12. During the past 12 months, did any of your household members go tobogganing?

YES /_/ NO /_/ - (GO to qu. 13)

IF YES: Please answer the following questions about your household's tobogganing during the past 12 months.

a) Which of your household members went tobogganing during the past 12 months?

Male head of household /_/ Homemaker /_/ Child(ren) /_/
Other household member(s) /_/

b) On about how many different days during the past 12 months did a household member(s) go tobogganing?

On about _____ different days, during the past 12 months

c) Where did your household member(s) most often go tobogganing? (CHECK ONE)

Public park /_/ Privately owned facility /_/

d) Going one way - about how far from your home is this place?

ONE WAY: About _____ mile(s) from home

e) About how long does it take to travel one way to this place?

ONE WAY: About _____ hour(s) or About _____ minutes

f) In what state did your household member(s) most often go tobogganing?

Delaware /_/ District of Columbia /_/ Maryland /_/
New Jersey /_/ New York /_/ Pennsylvania /_/ Virginia /_/
West Virginia /_/ Other /_/

13. During the past 12 months, did your household members go pleasure riding or driving (by car, bus, train, etc.)?

YES /_/ NO /_/ - (Go to qu. 14)

IF YES: Please answer the following questions about your household's pleasure rides or drives during the past 12 months.

a) Which household members went pleasure riding or driving during the past 12 months?

Male head of household /_/ Homemaker /_/ Child(ren) /_/
Other household member(s) /_/

b) On about how many different days during the past 12 months did a household member(s) go pleasure riding or driving?

On about _____ different days, during the past 12 months

c) What type of transportation was most often used for these pleasure rides or drives?

(CHECK ONE) Private automobile /_/ Public transportation (bus, train, etc.) /_/

d) Where did your household member(s) most often go for a pleasure ride or drive?

City driving or riding /_/ Country driving or riding /_/

e) Considering the round trip - about how far did your household member(s) go on one of these drives or rides?

ROUND TRIP: About _____ mile(s)

f) About how much time was usually spent round trip on one of these drives or rides?

ROUND TRIP: About _____ hour(s) or About _____ minutes

g) In what state did your household member(s) most often go for a pleasure drive or ride?

Delaware /_/ District of Columbia /_/ Maryland /_/
New Jersey /_/ New York /_/ Pennsylvania /_/ Virginia /_/
West Virginia /_/ Other /_/

14. Does your household own a vacation cottage or cabin - AND/OR during the past 12 months, did your household rent a vacation cottage or cabin?

YES, own a vacation cottage/cabin /_/ YES, rented a vacation cottage/cabin in the past 12 months /_/ NO, neither own a vacation cabin/cottage nor rented one in past 12 months /_/

IF YES: Please answer the following questions about the vacation cottage you LAST OCCUPIED during the past 12 months.

a) Where was this vacation cabin or cottage located?

On ocean /_/ On bay /_/ On river /_/ On lake /_/
On pond /_/ Not on water /_/

b) If you rented this cabin or cottage, how much rent did you pay per week?

RENT PER WEEK: _____ Owned cottage /_/

c) Going one way - about how far from your home is this cabin or cottage located?

ONE WAY: About _____ mile(s) from home

15. Do you think your household members would like to spend a vacation living on a farm, paying for room and meals, and participating in farm activities?

YES /_/ NO /_/

a) Please explain why you think they would or would not: _____

_____

16. During the past 12 months, was any household member(s) dissatisfied with any of the outdoor recreation facilities that they used?

YES /_/ NO /_/ - (Go to qu. 17)

IF YES:

a) Please check the reason(s) a household member(s) was dissatisified with outdoor recreational facilities. (CHECK ALL THAT APPLY)

Crowded /_/ Too expensive /_/ Dirty /_/ Unsafe /_/
Bad weather /_/

b) What type of facility were you (or other household member) dissatisfied with? (Explain) _____

_____

17. Are there any types of outdoor recreation facilities not available in your area that your household would like to have?

YES /_/ NO /_/ - (Go to qu. 18)

IF YES:

a) Please list the recreation facilities your household would like to have, then, b) for each one, indicate how much you would be willing to pay per visit to each.

(a) RECREATION FACILITIES	(b) AMOUNT WILLING TO PAY PER VISIT
_____	_____
_____	_____
_____	_____

18. During the past 12 months, for LONGER THAN A WEEKEND away from home - did any of your household members take a vacation trip(s), or combination business and vacation trip?

YES /_/ NO /_/ - (Go to qu. 19)

IF YES: Please answer the following questions about this LONGER THAN A WEEKEND vacation trip(s) or combination business-vacation (trips) during the past 12 months.

a) Which of your household members went on a LONGER THAN A WEEKEND vacation trip(s) or combination business-vacation trip(s) during the past 12 months?

Male head of household /_/ Homemaker /_/ Child(ren) /_/
Other household member(s) /_/

b) FOR EACH OF THESE "LONGER THAN A WEEKEND" TRIPS:

(1) What was the destination? (Give city or location & State or foreign country)		(2) Round trip - how many miles were traveled? (answer for each trip)
City or Location	State or foreign country	
_____	_____	_____ miles round trip
_____	_____	_____ miles round trip
_____	_____	_____ miles round trip

(3)
Round trip - how many days did this trip last? (From home till return)
ANSWER FOR EACH TRIP
____ hours round trip
____ hours round trip
____ hours round trip

c) In what season(s) of the year was this trip(s) made? (CHECK ALL THAT APPLY)

Summer /_/ Fall /_/ Winter /_/ Spring /_/

d) For this trip(s), what was your means of transportation? (CHECK ALL THAT APPLY)

Private automobile /_/ Rented automobile /_/ Airplane /_/
Bus /_/ Ship or boat /_/ Train /_/

e) Please check to indicate the activity(ies) in which your household members participated while on this trip.

Sports activities /_/ Relaxing /_/ Swimming at the beach /_/
Camping /_/ Boating /_/ Fishing /_/ Visiting friends/ relatives /_/ Other /_/ Sightseeing /_/ World's Fair /_/

19. During the past 12 months, OTHER THAN FOR BUSINESS - did any of your household members take a weekend trip(s)?

YES /_/ NO /_/ - (Go to qu. 20)

IF YES: Please answer the following questions about each weekend trip taken FOR OTHER THAN BUSINESS during the past 12 months.

a) Which of your household members went on a weekend trip(s) for other than business, during the past 12 months?

Male head of household /_/ Homemaker /_/ Child(ren) /_/
Other household member(s) /_/

b) About how many weekend trips for other than business did your household member(s) take during the past 12 months?

About _____ weekend trips for other than business, during the past 12 months

c) FOR EACH OF THESE WEEKEND TRIPS FOR PLEASURE:

(1) What was the destination? Give city or location and state. (LIST PLACES VISITED) City or location	State	(2) Round trip - about how many miles were traveled on this trip? (ANSWER FOR EACH PLACE VISITED)
_____	_____	_____ miles round trip
_____	_____	_____ miles round trip
_____	_____	_____ miles round trip

d) For this weekend trip(s), what means of transportation did you most often use?

Private auto /_/ Rented auto /_/ Airplane /_/ Bus /_/
Train /_/ Boat /_/

e) Please check to indicate the activity(ies) in which your household members participated while on this trip.

Sports activities /_/ Relaxing /_/ Swimming at beach /_/
Camping /_/ Boating /_/ Fishing /_/ Visiting friends/ relatives /_/ Other /_/ Sightseeing /_/ World's Fair /_/

20. What do you think would be your household members' ideas of a "good vacation"?

_____

_____

21. During the past 12 months, about how many hours per month (average), if any, did you, yourself, spend in community, religious, and/or charitable organizations?

About _____hours per month, during the past 12 months NONE /_/

22. During the past 12 months, about how many hours per month (average), if any, did your male head of household spend in community, religious, and/or charitable organizations?

About _____hours per month, during the past 12 months NONE /_/
No male head of household /_/ - (Go to qu. 31)

23. How many hours per week does the male head of your household work - including any overtime normally worked?

Works _____ hours per week Retired or unemployed /_/-(Go to qu. 30)

24. What hours of the day does the male head of household work?

From _____AM /_/ PM /_/ to _____AM /_/ PM /_/

25. On which day(s) of the week does the male head of household NOT work?

DOES NOT WORK: Sunday /_/ Monday /_/ Tuesday /_/ Wednesday /_/ Thursday /_/ Friday /_/ Saturday /_/

26. Going one way - about how long does it take the male head of household to travel to work? (ANSWER IN ONE SPACE ONLY)

ONE WAY: About _____ minutes or About _____ hour(s)

27. Is the male head of household entitled to an annual vacation with pay?

YES /_/ NO /_/ - (Go to qu. 28)

IF YES:

a) How long is his paid vacation?

1 week /_/ 2 weeks /_/ 3 weeks /_/ 4 weeks /_/
More than 4 weeks /_/

28. Is the male head of household entitled to an annual vacation without pay?

YES /_/ NO /_/ - (Go to qu. 29)

IF YES:

a) How long is his unpaid vacation?

1 week /_/ 2 weeks /_/ 3 weeks /_/ 4 weeks /_/
More than 4 weeks /_/

29. IF THE MALE HEAD OF THE HOUSEHOLD IS ENTITLED TO A PAID OR UNPAID VACATION:

During the past 12 months, did the male head of your household spend any allotted vacation time at home, rather than on a trip?

YES /_/ NO /_/ - (Go to qu. 30)

IF YES:

a) How many days of this allotted vacation did he spend at home?

NUMBER OF DAYS SPENT AT HOME: _____ days

b) What season(s) of the year was this? (CHECK ALL THAT APPLY)

Summer /_/ Fall /_/ Winter /_/ Spring /_/

30. Where has the male head of your household lived most of his life? (CHECK ONE)

In a town or city of less than 10,000 /_/
In a city of more than 10,000 ..... /_/
In a suburban area, not in a city .. /_/
In the country, but not on a farm .. /_/
On a farm ..... /_/

31. Where have you, the homemaker, lived most of your life?

In a town or city of less than 10,000 /_/
In a city of more than 10,000 ..... /_/
In a suburban area, not in a city ... /_/
In the country, but not on a farm ... /_/
On a farm ..... /_/

32. Are there any physical handicaps or health problems which limit you or other members of your household in leisure time activities?

YES /_/ NO /_/

Appendix Table 1. Regression coefficients (b_i's), their standard errors (S_{bi}'s), "t" values, levels of significance, and sample means with Y' as the dependent variable for pleasure rides

Variable		b_i	S_{bi}	t	Level of significance 1/	Mean
0 or 1	Y'					.812
Intercept constant	a	.504323	--	--	--	
Miles round trip	X1	.000843	.000233	3.618	.01	72.122
	$X1^2$	-.000001	.000001	-.300	.75	14,599.704
Time round trip	X2	.002659	.000140	19.037	.01	171.201
	$X2^2$	-.000003	.000001	-13.140	.01	57,402.122
	(X1)·X2	-.000002	.000001	-4.101	.01	
Physical handicaps	X6	.031714	.016807	1.887	.10	
Age of homemaker	X9	-.002994	.000595	-5.030	.01	44.322
Auto ownership	X10	-.031549	.027149	-1.162	.25	1.079
Educational level	X12	.006470	.002963	2.184	.05	11.542
Income	X14	.000002	.000003	.754	.50	8,188.591
	$X14^2$	-.000001	.000000	-.979	.35	153,251,164.141

$R = .598$ 2/ $R^2 = .357$ 3/ $S_E = .314$ 4/ $F = 86.309$ 5/

1/ For N-K-1 = 1706 degrees of freedom where K = number of independent variables.
2/ Multiple correlation coefficient.
3/ Coefficient of determination.
4/ Standard error of estimate.
5/ The "F" value is a measure of the test of the null hypothesis that $R^2 = 0$ where the ratio $F = \frac{R^2}{1-R^2} \cdot \frac{N-K-1}{K}$ has an "F" distribution with K and N-K-1 degrees of freedom and K is the number of independent variables. The value indicated is significantly different from zero at the .01 level with 11 and 1706 degrees of freedom.

Appendix Table 2. Matrix of correlation coefficients with Y' as the dependent variable for pleasure rides

	Y'	X1	$X1^2$	X2	$X2^2$	X1 · X2	X6	X9	X10	X12	X14	$X14^2$
Y'	1.00	.28	.09	.40	.18	.13	.08	-.12	-.07	.05	.01	-.03
X1		1.00	.88	.62	.57	.82	.01	.08	.02	-.06	.01	.01
$X1^2$			1.00	.42	.47	.80	.01	.07	-.01	-.02	.02	.01
X2				1.00	.90	.72	.01	.07	-.01	-.06	.01	.00 1/
$X2^2$					1.00	.77	.01	.09	.01	-.06	.02	.02
(X1)(X2)						1.00	.01	.09	-.01	-.04	.01	-.00 1/
X6							1.00	-.22	-.07	.11	.07	.04
X9								1.00	.14	-.25	.01	.04
X10									1.00	-.13	-.11	-.05
X12										1.00	.21	.10
X14											1.00	.95
$X14^2$												1.00

1/ Less than .005 or -.005.

Appendix Table 3. Regression coefficients (b_i's), their standard errors (S_{bi}'s), "t" values, and levels of significance with Y' as the dependent variable for picnicking

Variable		b_i	S_{bi}	t	Level of significance 1/	Mean
0 or 1	Y'					.627
Intercept constant	a	.417951				
Miles one way - 1st. choice	X1	-.009044	.001115	-8.109	.00	14.585
	$X1^2$	-.000015	.000004	-3.374	.00	1,254.955
Miles one way - 2nd. choice	X1'	.000803	.000787	1.019	.30	13.299
	$X1'^2$	-.000000	.000001	-0.249	.80	2,285.654
Time - 1st. choice	X2	.013537	.000805	16.804	.00	27.555
	$X2^2$	-.000051	.000005	-10.879	.00	2,780,455
	(X1)(X2)	.000067	.000008	8.251	.00	1,699.873
Time - 2nd. choice	X2'	.002645	.000609	4.345	.00	23.570
	$X2'^2$	-.000009	.000003	-3.091	.00	3,509.689
	(X1')(X2')	.000007	.000003	2.310	.02	2,114.024
Household size	X8	.027479	.006393	4.298	.00	3.796
Age of homemaker	X9	-.005353	.000745	-7.185	.00	44.322
Educational level	X12	.009895	.003404	2.906	.00	11.542
Income	X14	-.000003	.000003	-0.970	.35	8,188.591

R = .671 2/ R^2 = .450 3/ S_E = .360 4/ F = 93.040 5/

1/ For 1,703 degrees of freedom.
2/ Multiple correlation coefficient.
3/ Coefficient of determination.
4/ Standard error of estimate.
5/ Significantly different from zero at the .01 level with 14 and 1,703 degrees of freedom.

Appendix Table 4. Matrix of correlation coefficients with Y' as the dependent variable for picnicking

	Y	X1	$X1^2$	X1'	$X1'^2$	X2	$X2^2$	X2'	$X2'^2$	X1·X2	X1'·X2'	X8	X9	X12	X14
Y	1.00	.33	.07	.22	.06	.45	.09	.32	.09	.08	.07	.24	-.28	.14	-.01
X1		1.00	.78	.40	.31	.89	.74	.44	.52	.76	.51	.06	-.06	.04	.02
$X1^2$			1.00	.39	.39	.64	.93	.42	.67	.97	.66	.01	-.02	.02	.01
X1'				1.00	.86	.41	.46	.72	.67	.43	.66	.02	-.04	.06	.01
$X1'^2$					1.00	.30	.44	.40	.59	.42	.61	.03	.02	.01	.00 1/
X2						1.00	.72	.49	.51	.67	.49	.08	.08	.05	.01
$X2^2$							1.00	.50	.75	.98	.74	.01	.02	.02	.01
X2'								1.00	.77	.47	.71	.07	-.08	.07	-.00 1/
$X2'^2$									1.00	.73	.99	-.00 1/	-.01	.04	.01
X1·X2										1.00	.72	.01	-.02	.02	.01
X1'·X2'											1.00	-.01	-.01	.04	.01
X8												1.00	-.46	.11	.08
X9													1.00	-.25	.00 1/
X12														1.00	.21
X14															1.00

1/ Less than .005 or -.005.

Appendix Table 5. Regression coefficients (b_i's), their standard errors (S_{bi}'s), "t" values, and levels of significance with Y' as the dependent variable for pleasure walks

Variable		b_i	S_{bi}	t	Level of significance 1/	Mean
0 or 1	Y'					.503
Constant intercept	a	.110286				
Miles one way	X1	-.000938	.000553	-1.695	.10	14.485
	$X1^2$	.000001	.000001	2.529	.01	5,660.569
Time one way	X2	.005442	.000393	13.854	.01	22.921
	$X2^2$	-.000006	.000001	-11.942	.01	5,839.594
Length of work week	X4	.001602	.000476	3.363	.01	36.788
Farm residence	X7	.059186	.018275	3.239	.01	1.772
Household size	X8	.035253	.007122	4.949	.01	3.806
Income	X14	.000001	.000001	1.153	.25	8,188.591

$R = .440$ 2/ $R^2 = .194$ 3/ $S_E = .450$ 4/ $F = 51.252$ 5/

1/ For 1,709 degrees of freedom.
2/ Multiple correlation coefficient.
3/ Coefficient of determination.
4/ Standard error of estimate.
5/ Significantly different from zero at the .01 level with 8 and 1,709 degrees of freedom.

Appendix Table 6. Matrix of correlation coefficients with Y' as the dependent variable for pleasure walks

	Y'	X1	$X1^2$	X2	$X2^2$	X4	X7	X8	X14
Y'	1.00	.18	.09	.30	.12	.14	.08	.16	.04
$X1_2$		1.00	.92	.55	.53	-.00 1/	.02	.05	.01
X1			1.00	.31	.39	-.02	.02	.02	.01
X2				1.00	.86	.06	.00 1/	.04	.00 1/
$X2^2$					1.00	.03	-.00 1/	.02	.01
X4						1.00	.04	.29	.13
X7							1.00	.04	.01
X8								1.00	.08
X14									1.00

1/ Less than .005 or -.005.

Appendix Table 7. Regression coefficients (b_i's), their standard errors (S_{bi}'s), "t" values, and levels of singificance with Y' as the dependent variable for ocean swimming by homemakers

Variable		b_i	S_{bi}	t	Level of significance 1/	Mean
0 or 1	Y'					.368
Intercept constant	a	.299866				
Miles one way	X1	.002226	.000462	4.813	.01	67.454
	$X1^2$	-.000002	.000001	3.608	.01	28,410.198
Time	X2	.002565	.000361	7.108	.01	82.353
	$X2^2$	.000003	.000000	7.124	.01	28,830.637
Age	X9	.002201	.000875	2.516	.01	44.322
Race	X11	-.060612	.038471	1.575	.15	1.020
Income	X14	-.000001	.000001	1.056	.25	8,188.591

$R = .624$ 2/ $R^2 = .390$ 3/ $S_E = .378$ 4/ $F = 156.147$ 5/

1/ For 1,710 degrees of freedom.
2/ Multiple correlation coefficient.
3/ Coefficient of determination.
4/ Standard error of estimate.
5/ Significantly different from zero at the .01 level with 7 and 1,710 degrees of freedom.

Appendix Table 8. Matrix of correlation coefficients with Y' as the dependent variable for ocean swimming by homemakers

	Y'	X1	$X1^2$	X2	$X2^2$	X9	X11	X14
Y'	1.00	.37	.19	.45	.22	-.15	-.07	.05
X1		1.00	.94	.82	.79	-.05	-.02	.17
$X1^2$			1.00	.67	.78	-.00 1/	.00 1/	.16
X2				1.00	.89	-.09	-.04	.14
$X2^2$					1.00	-.02	-.01	.12
X9						1.00	-.10	.00 1/
X11							1.00	-.04
X14								1.00

1/ Less than .005 or -.005.

Appendix Table 9. Regression coefficients (b_i's), their standard errors (S_{bi}'s), "t" values and levels of significance with Y' as the dependent variable for swimming at pools away from home by children

Variable		b_i	S_{bi}	t	Level of significance1/	Mean
0 or 1	Y'					.364
Constant intercept	a	-.578412				
Miles one way	X1	-.001747	.000647	-2.701	.01	21.647
	$X1^2$	.000001	.000001	2.494	.01	14,511.998
Time one way	X2	.004201	.000506	8.298	.01	24.526
	$X2^2$	-.000004	.000001	-7.865	.01	12,044.505
Handicaps	X6	.077510	.021716	3.569	.01	1.777
Household size	X8	.318035	.033506	9.492	.01	3.796
	$X8^2$	-.026339	.003580	-7.356	.01	16.820
Age of homemaker	X9	.007185	.004691	1.532	.15	
	$X9^2$	-.000130	.000051	-2.532	.01	2,149.157
Race	X11	-.057253	.032237	-1.776	.10	1.020
Occupation	X13	-.004940	.003323	-1.486	.15	4.589
Income	X14	.000006	.000004	1.687	.10	8,188.591
	$X14^2$	-.000001	.000001	-1.695	.10	153,241,164.141

$R = .548$ 2/ $R^2 = .299$ 3/ $S_E = .404$ 4/ $F = 56.152$ 5/

1/ For 1,704 degrees of freedom.
2/ Multiple correlation coefficient.
3/ Coefficient of determination.
4/ Standard error of estimate.
5/ Significantly different from zero at the .01 level with 13 and 1,704 degrees of freedom.

Appendix Table 10. Matrix of correlation coefficients with Y' as the dependent variable for swimming at pools away from home by children

	Y'	X1	$X1^2$	X2	$X2^2$	X6	X8	$X8^2$	X9	$X9^2$	X11	X13	X14	$X14^2$
Y'	1.00	.09	.04	.15	.07	.15	.39	.33	-.36	-.38	-.01	-.18	.08	.02
X1		1.00	.97	.83	.80	-.01	-.05	-.03	-.04	-.04	-.01	-.06	.06	.04
$X1^2$			1.00	.75	.77	-.01	-.06	-.05	-.01	-.02	-.01	-.04	.05	.04
X2				1.00	.95	-.01	-.01	-.01	-.06	-.06	-.02	-.06	.08	.06
$X2^2$					1.00	-.02	-.03	-.03	-.02	-.03	-.01	-.03	.07	.06
X6						1.00	.09	.07	-.22	-.23	.06	-.12	.07	.04
X8							1.00	.98	-.46	-.48	.07	-.14	.08	.04
$X8^2$								1.00	-.39	-.41	.02	-.11	.07	.04
X9									1.00	.99	-.10	-.23	.01	.04
$X9^2$										1.00	-.10	-.25	-.02	.03
X11											1.00	.03	-.03	-.02
X13												1.00	-.24	-.12
X14													1.00	.95
$X14^2$														1.00

Appendix Table 11. Regression coefficients (b_i's), their standard errors (S_{bi}'s), "t" values, levels of significance, and sample means with Y' as the dependent variable for bay swimming for children

Variable		b_i	S_{bi}	t	Level of significance 1/	Mean
0 or 1	Y'					.133
Intercept constant	a	-.020732				
Miles one way	X1	.000701	.000488	1.437	.15	9.983
	$X1^2$	.000001	.000001	1.875	.10	2,773.537
Time one way	X2	.006993	.000369	18.936	.01	14.842
	$X2^2$	-.000009	.000001	-14.607	.01	3,952.637
Household size	X8	.070882	.020521	3.454	.01	3.796
	$X8^2$	-.005935	.002209	- 2.687	.01	16.820
Age of homemaker	X9	-.001628	.000530	-3.069	.01	44.332
Income	X14	-.000004	.000002	-1.824	.10	8,188.591
	$X14^2$	.000001	.000001	2.045	.05	153,251,164.141

$R = .673$ 2/ $R^2 = .453$ 3/ $S_E = 252$ 4/ $F = 157.111$ 5/

1/ For 1,709 degrees of freedom.
2/ Multiple correlation coefficient.
3/ Coefficient of determination.
4/ Standard error of estimate.
5/ Significantly different from zero at the .01 level with 9 and 1,708 degrees of freedom.

Appendix Table 12. Matrix of correlation coefficients with Y' as the dependent variable for bay swimming by children

	Y'	X1	$X1^2$	X2	$X2^2$	X8	$X8^2$	X9	X14	$X14^2$
Y'	1.00	.30	.07	.38	.12	.19	.16	-.18	.04	.01
X1		1.00	.91	.89	.88	.02	.01	-.02	.02	.01
$X1^2$			1.00	.76	.93	-.02	-.02	.01	-.00 1/	-.00 1/
X2				1.00	.87	.06	.05	-.05	.01	-.00 1/
$X2^2$					1.00	-.01	-.01	.00 1/	-.00 1/	-.01
X8						1.00	.98	-.46	.09	.04
$X8^2$							1.00	-.39	.07	.04
X9								1.00	.00 1/	.04
X14									1.00	.95
$X14^2$										1.00

1/ Less than .005 or -.005.

Appendix Table 13. Regression coefficients (b_i's), their standard errors (S_{bi}'s), "t" values, and levels of significance with Y' as the dependent variable for boating activities

Variable		b_i	S_{ib}	t	Level of significance 1/	Mean
0 or 1	Y'					.277
Intercept constant	a	.219983				
Miles one way	X1	.000310	.000580	.534		28.206
	$X1^2$	-.000001	.000001	-1.188	.15	13,749.651
Time one way	X2	.006411	.000445	14.412	.01	35.935
	$X2^2$	-.000008	.000001	-10.500	.01	16,134.924
(miles)(time)	(X1)(X2)	.000003	.000001	2.875	.01	13,197.594
Auto ownership	X10	-.081757	.037861	-2.159	.05	1.078
Income	X14	.000001	.000001	1.261	.15	8,188.591

$R = .689$ 2/ $R^2 = .474$ 3/ $S_E = .325$ 4/ $F = 220.253$ 5/

1/ For 1,710 degrees of freedom.
2/ Multiple correlation coefficient.
3/ Coefficient of determination.
4/ Standard error of estimate.
5/ Significantly different from zero at the .01 level with 7 and 1,710 degrees of freedom.

Appendix Table 14. Matrix for correlation coefficients with Y' as the dependent variable for boating activities

	Y'	X1	$X1^2$	X2	$X2^2$	X1 • X2	X10	X14
Y'	1.00	.38	.22	.46	.25	.23	-.09	.10
X1		1.00	.94	.88	.84	.88	-.02	.06
$X1^2$			1.00	.76	.82	.89	-.00 1/	.04
X2				1.00	.93	.90	-.03	.07
$X2^2$					1.00	.98	-.02	.05
(X1)(X2)						1.00	-.01	.05
X10							1.00	-.11
X14								1.00

1/ Less than .005 or -.005.

levels of significance with Y' as the dependent variable for camping

Variable		b_i	S_{bi}	t	Level of significance 1/	Mean
0 or 1	Y'					.138
Intercept constant	a	-.023405				
Miles one way	X1	.000148	.000063	2.356	.02	37.38
	$X1^2$	-.0000001	.0000001	-1.703	.08	135,372.574
Time one way	X2	.083809	.004519	18.547	.00	.592
	$X2^2$	-.000868	.000047	-18.428	.00	20.417
Fee per day	X3	.003518	.000155	22.653	.00	17.181
	$X3^2$	-.000003	.000001	-14.548	.00	6,482.791
Household size	X8	.023292	.003648	6.385	.00	3.795
Income	X14	-.000001	.000000	- 0.521	.60	8,188.591

$R = .744$ 2/ $R^2 = .553$ 3/ $S_E = .231$ 4/ $F = 264.250$ 5/

1/ For 1,709 degrees of freedom.
2/ Multiple correlation.
3/ Coefficient of determination.
4/ Standard error of estimate.
5/ Signifidantly different from zero at the .01 level with 8 and 1,709 degrees of freedom.

Appendix Table 16. Matrix of correlation coefficients with Y' as the dependent variable for camping

	Y'	X1	$X1^2$	X2	$X2^2$	X3	$X3^2$	X8	X14
Y'	1.00	.25	.11	.32	.13	.53	.30	.21	.02
X1		1.00	.93	.41	.39	.20	.11	.05	.06
$X1^2$			1.00	.16	.17	.11	.05	.03	.04
X2				1.00	.94	.14	.07	.03	.10
$X2^2$					1.00	.04	.01	.00 1/	.09
X3						1.00	.87	.13	-.01
$X3^2$							1.00	.08	-.01
X8								1.00	.08
X14									1.00

1/ Less than .005.

Appendix Table 17. Regression coefficients (b_i's), their standard errors (S_{bi}'s), "t" values and levels significance with Y' as the dependent variable for fishing

Variable		b_i	S_{bi}	t	Level of significance 1/	Mean
0 or 1	Y'					.379
	a	-.183470				
Miles one way -1st. choice	X1	-.001968	.000527	-3.734	.01	28.647
	$X1^2$	.000003	.000001	5.053	.01	11,043.314
Miles one way -2nd. choice	X1'	.003848	.000539	7.131	.01	12.565
	$X1'^2$	-.000003	.000001	-7.614	.01	4,057.718
Time - 1st. choice	X2	.007025	.000414	16.982	.01	38.399
	$X2^2$	-.000007	.000001	-17.305	.01	13,828.759
Fee per day	X3	.000329	.000150	2.198	.05	5.864
Physical handicaps	X6	.032649	.018627	1.753	.10	1.778
Farm or urban residence	X7	.023987	.014423	1.663	.10	1.772
Household size	X8	.088711	.026830	3.306	.01	3.796
	$X8^2$	-.006539	.002977	-2.197	.05	16.820
Auto ownership	X10	-.076995	.030450	-2.528	.01	1.020
Educational level	X12	.036147	.014178	2.549	.01	11.542
	$X12^2$	-.001577	.000662	-2.382	.05	141.222
Income	X14	-.000008	.000003	-2.470	.01	8,188.591
	$X14^2$	.000000	.000000	2.130	.05	153,251,164.141

$R = .691$ 2/ $R^2 = .477$ 3/ $S_E = .352$ 4/ $F = 91.297$ 5/

1/ For 1,701 degrees of freedom.
2/ Multiple correlation coefficient.
3/ Coefficient of determination.
4/ Standard error of estimate.
5/ Significantly different from zero at the .01 level with 16 and 1,701 degrees of freedom.

Appendix Table 18. Matrix of correlation coefficients with Y' as the dependent variable for fishing

	Y'	X1	$X1^2$	X1'	$X1'^2$	X2	$X2^2$	X3	X6	X7	X8	$X8^2$	X10	X12	$X12^2$	X14	$X14^2$
Y'	1.00	.35	.16	.26	.10	.42	.19	.13	.07	.06	.18	.15	-.08	.06	.05	.01	-.01
X1		1.00	.92	.19	.14	.88	.85	.03	.03	.15	.05	.03	-.06	.09	.09	.08	.05
$X1^2$			1.00	.13	.13	.73	.83	-.01	.01	.04	.02	.01	-.04	.06	.06	.08	.06
X1'				1.00	.90	.20	.13	.06	.01	.02	.05	.03	-.04	.03	.02	.04	.03
$X1'^2$					1.00	.14	.13	.01	.01	.04	.02	.00 1/	-.04	.06	.06	.08	.06
X2						1.00	.91	.05	.03	.04	.06	.05	.05	.08	.08	.06	.03
$X2^2$							1.00	-.00	.02	.04	.03	.02	-.03	.07	.08	.07	.04
X3								1.00	.01	.01	.02	.02	-.03	-.04	-.05	-.01	-.01
X6									1.00	.05	.08	.07	-.07	.11	.10	.07	.04
X7										1.00	.05	.04	.00 1/	.10	.08	.01	-.00 1/
X8											1.00	.98	-.06	.11	.10	.08	.04
$X8^2$												1.00	-.06	.09	.07	.07	.04
X10													1.00	-.14	-.13	-.11	-.05
X12														1.00	.98	.21	.11
$X12^2$															1.00	.23	.13
X14																1.00	.95
$X14^2$																	1.00

1/ Less than .005 or -.005.

Appendix Table 19. Regression coefficients (b_i's), their standard errors (S_{bi}'s), "t" values and levels of significance with Y' as the dependent variable for hunting

Variable		b_i	S_{bi}	t	Level of significance 1/	Mean
0 or 1	Y'					.143
Intercept constant	a	.295541				
Miles one way	X1	-.000443	.000518	.856	--	11.396
	$X1^2$	.000001	.000001	1.322	.20	4,516.200
Time	X2	.260658	.019912	13.090	.01	.327
	$X2^2$	-.004960	.000389	12.748	.01	3.341
Fee	X3	.000561	.000164	3.418	.01	3.583
Farm residence	X7	-.017233	.014359	1.200	.20	1.772
Age	X9	-.003281	.000669	4.905	.01	44.322
Auto ownership	X10	-.047710	.030946	1.512	.15	1.078
Educational level	X12'	.013123	.006748	1.945	.10	10.647
	$X12'^2$	-.001007	.000379	2.650	.01	133.150
Income	X14	.000001	.000003	.277	--	8,188.591
	$X14^2$	-.000000	.000000	.286	--	153,251,164.141

$R = .687$ 2/ $R^2 = .472$ 3/ $S_E = .255$ 4/ $F = 127.195$ 5/

1/ For 1,705 degrees of freedom.
2/ Multiple correlation coefficient.
3/ Coefficient of determination.
4/ Standard error of estimate.
5/ Significantly different from zero at the .01 level with 12 and 1,705 degrees of freedom.

Appendix Table 20. Matrix of correlation coefficients with Y' as the dependent variable for hunting

	Y'	X1	$X1^2$	X2	$X2^2$	X3	X7	X9	X10	X12'	$X12'^2$	X14	$X14^2$
Y'	1.00	.42	.15	.44	.13	.17	-.04	-.17	-.08	.00 1/	-.04	-.02	-.00 1/
X1		1.00	.85	.83	.60	.10	-.03	-.04	-.03	.00 1/	-.00	.00 1/	.02
$X1^2$			1.00	.66	.62	.01	-.01	-.00 1/	-.01	.00 1/	-.00 1/	.00 1/	-.00 1/
X2				1.00	.86	.08	-.01	-.05	-.03	-.00 1/	-.03	-.00 1/	.00 1/
$X2^2$					1.00	.00 1/	.00 1/	-.01	-.01	-.00 1/	-.02	-.00 1/	-.00 1/
X3						1.00	-.06	.02	.01	.00 1/	.01	.03	.04
X7							1.00	-.11	.00 1/	.07	.07	.00 1/	-.00 1/
X9								1.00	.14	-.33	-.29	.00 1/	.04
X10									1.00	-.26	-.23	-.11	-.05
X12'										1.00	.96	.20	.10
$X12'^2$											1.00	.25	.13
X14												1.00	.95
$X14^2$													1.00

1/ Less than .005 or -.005.

Appendix Table 21. Regression coefficients (b_i's), their standard errors (S_{bi}'s), "t" values, levels of significance, and sample means with Y' as the dependent variable for golfing

Variable		b_i	S_{bi}	t	Level of significance 1/	Mean
0 or 1	Y'					.153
Intercept constant	a	.012928				
Miles one way	X1	-.023150	.000820	-28.231	.01	3.318
	$X1^2$	.000050	.000001	32.776	.01	1,091.942
Time one way	X2	.035702	.000811	44.000	.01	5.416
	$X2^2$	-.000062	.000001	-39.627	.01	1,313.592
Race	X11	-.025562	.017759	- 1.439	.15	1.020
Educational level	X12	-.003807	.004196	- .907	.40	11.542
	$X12^2$	.000558	.000241	2.316	.05	141.222
Income	X14	.000006	.000002	3.050	.01	8,188.591
	$X14^2$	-.000000	.000000	- 2.432	.05	153,251,164.141

$R = .782$ 2/ $R^2 = .612$ 3/ $S_E = .225$ 4/ $F = 299.496$ 5/

1/ For 1708 degrees of freedom.
2/ Multiple correlation coefficient.
3/ Coefficient of determination.
4/ Standard error of estimate.
5/ Significantly different from zero at the .01 level with 9 and 1708 degrees of freedom.

Appendix Table 22. Matrix of correlation coefficients with Y' as the dependent variable for golfing

	Y'	X1	$X1^2$	X2	$X2^2$	X11	X12	$X12^2$	X14	$X14^2$
Y'	1.00	.24	.10	.35	.12	-.05	.16	.18	.16	-.13
X1		1.00	.91	.90	.89	-.02	.03	.04	.09	.08
$X1^2$			1.00	.79	.95	-.01	.02	.02	.05	.05
X2				1.00	.90	-.02	.04	.05	.04	.01
$X2^2$					1.00	-.00 1/	.02	.02	.01	-.00 1/
X11						1.00	.03	.02	-.03	-.02
X12							1.00	.96	.20	.10
$X12^2$								1.00	.02	.02
X14									1.00	.95
$X14^2$										1.00

1/ Less than -.005.

Appendix Table 23. Regression coefficients (b_i's), their standard errors (S_{bi}'s), "t" values, levels of significance, and sample means with Y' as the dependent variable for horseback riding

Variable		b_i	S_{bi}	t	Level of significance 1/	Mean
0 or 1	Y'					.120
Intercept constant	a	-.091797				
Miles one way	X1	-.008053	.000936	-8.599	.01	5.054
	$X1^2$	.000012	.000001	10.355	.01	2,286.013
Time	X2	.015800	.000870	18.153	.01	6.597
	$X2^2$	-.000020	.000001	-16.983	.01	2,481.133
Household size	X8	.015761	.005871	2.684	.01	3.796
Age	X9	.004565	.003760	1.214	.20	44.322
	$X9^2$	-.000062	.000041	-1.528	.15	2,149.157
Income	X14	.000006	.000002	2.335	.05	8,188.591
	$X14^2$	-.000000	.000000	-2.585	.05	153,251,164.141

$R = .627$ 2/ $R^2 = .394$ 3/ $S_E = .254$ 4/ $F = 123.217$ 5/

1/ 1,708 degrees of freedom.
2/ Multiple correlation coefficient.
3/ Coefficient of determination.
4/ Standard error of estimate.
5/ Significantly different from zero at the .01 level with 9 and 1,708 degrees of freedom.

Appendix Table 24. Matrix of correlation coefficients with Y' as the dependent variable for horseback riding

	Y'	X1	$X1^2$	X2	$X2^2$	X8	X9	$X9^2$	X14	$X14^2$
Y'	1.00	.29	.16	.36	.17	.17	-.13	-.15	.03	.00
X1		1.00	.93	.84	.83	.05	-.03	-.04	.04	.03
$X1^2$			1.00	.74	.86	.03	-.02	-.03	.02	.01
X2				1.00	.92	.06	-.04	-.04	.05	.04
$X2^2$					1.00	.04	-.02	-.02	.03	.02
X8						1.00	-.46	-.49	.08	.04
X9							1.00	.99	.00 1/	.04
$X9^2$								1.00	-.02	.03
X14									1.00	.95
$X14^2$										1.00

1/ Less than .005.

Appendix Table 25. Regression coefficients (b_i's), their standard errors (S_{bi}'s), "t" values and levels of significance with Y' as the dependent variable for ice skating

Variable		b_i	S_{bi}	t	Level of significance 1/	Mean
0 or 1	Y'					.244
Intercept constant	a	-.112135				
Miles one way	X1	-.039652	.002992	-13.254	.01	1.665
	$X1^2$	.000109	.000011	9.646	.01	149.856
Time one way	X2	.047489	.001446	32.833	.01	4.357
	$X2^2$	-.000114	.000007	-16.084	.01	317.887
Length of work week	X4	.001229	.000313	3.925	.01	36.810
Household size	X8	.038729	.004858	7.972	.01	3.795
Income	X14	.000007	.000002	2.660	.01	8,188.591
	$X14^2$	-.000000	.000000	-2.539	.01	153,251,164.141

R - .737 2/ R^2 - .543 3/ S_E = .291 4/ F = 253.520 5/

1/ For 1,709 degrees of freedom.
2/ Multiple correlation coefficient.
3/ Coefficient of determination.
4/ Standard error of estimate.
5/ Significantly different from zero at the .01 level with 8 and 1,709 degrees of freedom.

Appendix Table 26. Matrix of correlation coefficients with Y' as the dependent variable for ice skating

	Y'	X1	$X1^2$	X2	$X2^2$	X4	X8	X14	$X14^2$
Y'	1.00	.24	.09	.43	.12	.18	.29	.06	.02
X1		1.00	.93	.94	.94	.01	.06	.04	.00 1/
$X1^2$			1.00	.81	.96	.02	.04	.03	.00 1/
X2				1.00	.87	.04	.11	.04	.01
$X2^2$					1.00	-.01	.07	.03	.00 1/
X4						1.00	.31	.13	.07
X8							1.00	.08	.04
X14								1.00	.95
$X14^2$									1.00

1/ Less than .005.

Appendix Table 27. Regression coefficients (b_i's), their standard errors (S_{bi}'s), "t" values, levels of significance, and sample means with Y' as the dependent variable for tobogganing

Variable		b_i	S_{bi}	t	Level of significance 1/	Mean
0 or 1	Y'					.033
Intercept constant	a	.004391				
Miles one way	X1	-.083240	.004816	17.283	.01	.943
	$X1^2$	.000350	.000021	17.506	.01	113.353
Time one way	X2	.069136	.003128	22.105	.01	1.680
	$X2^2$	-.000192	.000009	20.965	.01	299.368
Income	X14	.000001	.000001	.908	--	8,188.591
	$X14^2$	-.000000	.000000	.943		153,251,164.141

$R = .780$ 2/ $R^2 = .609$ 3/ $S_E = .111$ 4/ $F = 444.204$ 5/

1/ For 1,711 degrees of freedom.
2/ Multiple correlation coefficient.
3/ Coefficient of determination.
4/ Standard error of estimate.
5/ Significantly different from zero at the .01 level with 6 and 1,711 degrees of freedom.

Appendix Table 28. Matrix of correlation coefficients with Y' as the dependent variable for tobogganing

	Y'	X1	$X1^2$	X2	$X2^2$	X14	$X14^2$
Y'	1.00	.48	.32	.53	.36	.00 1/	-.02
X1		1.00	.91	.98	.93	.00 1/	-.00 1/
$X1^2$			1.00	.86	.96	-.00 1/	-.00 1/
X2				1.00	.93	-.00 1/	-.00 1/
$X2^2$					1.00	-.00 1/	-.00 1/
X14						1.00	.95
$X14^2$							1.00

1/ Less than .005 or -.005.

Appendix Table 29. Regression coefficients (b_i's), their standard errors (S_{bi}'s), "t" values and levels of significance with Y' as the dependent variable for snow skiing

Variable		b_i	S_{bi}	t	Level of significance 1/	Mean
0 or 1	Y'					.030
Intercept constant	a	-.004686				
Miles one way	X1	-.013135	.001108	11.854	.01	4.133
	$X1^2$	.000020	.000002	12.584	.01	2,095.731
Time one way	X2	.017214	.000891	19.320	.01	5.444
	$X2^2$	-.000023	.000002	15.228	.01	2,557.204
Income	X14	.000002	.000001	1.497	.15	8,188.591
	$X14^2$	-.000000	.000000	1.730	.10	153,251,164.141

$R = .838$ 2/ $R^2 = .702$ 3/ $S_E = .093$ 4/ $F = 672.050$ 5/

1/ For 1,711 degrees of freedom.
2/ Multiple correlation coefficient.
3/ Coefficient of determination.
4/ Standard error of estimate.
5/ Significantly different from zero at the .01 level with 6 and 1,711 degrees of freedom.

Appendix Table 30. Matrix of correlation coefficients with Y' as the dependent variable for snow skiing

	Y'	X1	$X1^2$	X2	$X2^2$	X14	$X14^2$
Y'	1.00	.44	.22	.54	.28	.15	.13
X1		1.00	.94	.98	.96	.08	.07
$X1^2$			1.00	.87	.99	.03	.02
X2				1.00	.92	.11	.10
$X2^2$					1.00	.05	.04
X14						1.00	.95
$X14^2$							1.00

Appendix Table 31. Regression coefficients (b_i's), their standard errors (S_{bi}'s), "t" values and levels of significance with Y as the dependent variable for vacation trips

Variable		b_i	S_{bi}	t	Level of significance 1/	Mean
Number of trips	Y					.973
Intercept constant	a	-.087885				
Miles round trip - 1st. choice	X1	.000336	.000028	11.859	.01	703.119
	$X1^2$	-.000001	.000000	-10.360	.01	2,699,997.050
Length of trip - 1st. choice	X2	.005522	.002371	2.329	.01	2.951
Miles round trip - 2nd. choice	X1'	.001094	.000057	19.111	.01	197.652
	$X1'^2$	-.000001	.000000	-17.369	.01	477,747.575
Length of trip - 2nd. choice	X2'	.041589	.005897	7.052	.01	.836
Miles round trip - 3rd. choice	X1"	.001198	.000080	14.989	.01	74.549
	X1"^{2}	-.000001	.000000	-11.690	.01	190,261.260
Length of trip - 3rd. choice	X2"	-.011566	.011566	- 1.780		.374
Physical handicaps	X6	.085295	.036078	2.364	.01	1.778
Age of homemaker	X12	.012018	.007708	1.559	.20	44.322
	$X12^2$	-.000132	.000083	- 1.599	.20	2,149.157
Income	X14	.000044	.000006	7.356	.01	8,188.591
	$X14^2$	-.000001	.000000	- 6.890	.01	
		R = .726 2/	R^2 = .526 3/	S_E = .671 4/	F = 135.170 5/	

1/ For 1,703 degrees of freedom.
2/ Multiple correlation coefficient.
3/ Coefficient of determination.
4/ Standard error of estimate.
5/ Significantly different from zero at the .01 level with 14 and 1,703 degrees of freedom.

Appendix Table 32. Regression coefficients (b_i's), their standard errors (S_{bi}'s), "t" values, levels of significance with Y' as the dependent variable for vacation trips

Variable		b_i	S_{bi}	t	Level of Significance1/	Mean
0 or 1	Y'					.618
Intercept constant	a	.264869				
Miles round trip - 1st. choice	X1	.000321	.000020	15.711	.01	703.119
	$X1^2$	-.000003	.000000	-13.154	.01	2,699,977.000
Length of trip - 1st. choice	X2	.006171	.001714	3.598	.01	2.950
Miles round trip - 2nd. choice	X1'	.000194	.000041	4.690	.01	197.652
	$X1'^2$	-.000001	.000000	-4.669	.01	477,747.575
Length of trip - 2nd. choice	X2'	.007203	.004265	1.689	.10	.836
Miles round trip - 3rd. choice	X1"	.000111	.000058	1.917	.10	74.549
	$X1''^2$	-.000001	.000001	-1.851	.10	190,261.260
Length of trip - 3rd. choice	X2"	-.006094	.004705	-1.295	.20	.374
Income	X14	.000026	.000004	6.153	.01	8,188.591
	$X14^2$	-.000000	.000000	-5.432	.01	153,251,164.141

$R = .587$ 2/ $R^2 = .344$ 3/ $S_E = .395$ 4/ $F = 81.413$ 5/

1/ For 1,706 degrees of freedom.
2/ Multiple correlation coefficient.
3/ Coefficient of determination.
4/ Standard error of estimate.
5/ Significantly different from zero at the .01 level with 11 and 1,706 degrees of freedom.

Appendix Table 33. Matrix of correlation coefficients with Y as the dependent variable for vacation trips

	Y	X1	$X1^2$	X2	X1'	$X1'^2$	X2'	X1"	$X1''^2$	X2"	X6	X12	$X12^2$	X14	$X14^2$
Y	1.00	.29	.14	.27	.46	.24	.35	.37	.15	.26	.10	.02	-.01	.19	.10
X1		1.00	.90	.42	.24	.18	.17	.09	.04	.09	.06	.06	.05	.19	.14
$X1^2$			1.00	.36	.15	.12	.14	.04	.02	.06	.03	.06	.05	.17	.14
X2				1.00	.16	.10	.32	.14	.08	.24	.02	.08	.07	.12	.08
X1'					1.00	.88	.59	.36	.20	.25	.03	.06	.05	.10	.07
$X1'^2$						1.00	.58	.30	.18	.17	.01	.05	.04	.04	.03
X2'							1.00	.29	.20	.37	.04	.05	.05	.07	.04
X1"								1.00	.84	.40	.02	.05	.05	.09	.07
$X1''^2$									1.00	.23	.01	.05	.05	.04	.02
X2"										1.00	.01	.04	.03	.04	.03
X6											1.00	-.22	-.23	.07	.04
X12												1.00	.99	.00 1/	.04
$X12^2$													1.00	-.02	.03
X14														1.00	.95
$X14^2$															1.00

1/ Less than .005.

Appendix Table 34. Matrix of correlation coefficients with Y' as the dependent variable for vacation trips

	Y'	X1	$X1^2$	X2	X1'	$X1'^2$	X2'	X1"	$X1''^2$	X2"	X14	$X14^2$
Y'	1.00	.37	.19	.29	.23	.11	.17	.14	.05	.10	.18	.10
X1		1.00	.91	.42	.24	.18	.17	.09	.04	.09	.19	.14
$X1^2$			1.00	.36	.15	.12	.14	.04	.02	.06	.17	.14
X2				1.00	.16	.10	.32	.14	.08	.24	.12	.08
X1'					1.00	.88	.59	.36	.20	.25	.10	.07
$X1'^2$						1.00	.58	.30	.18	.17	.04	.03
X2'							1.00	.29	.20	.37	.07	.04
X1"								1.00	.84	.40	.09	.07
$X1''^2$									1.00	.23	.04	.02
X2"										1.00	.04	.04
X14											1.00	.95
$X14^2$												1.00

Appendix Table 35. Regression coefficients (b_i's), their standard errors (S_{bi}'s), "t" values and levels of significance with Y' as the dependent variable for weekend trips

Variable		b_i	S_{bi}	t	Level of significance 1/	Mean
0 or 1	Y'					.566
Intercept constant	a	-.024233				
Miles round trip - 1st. choice	X1	.001304	.000053	24.614	.01	162.101
	$X1^2$	-.000001	.000000	-15.738	.01	101,037.726
Miles round trip - 2nd. choice	X1'	.000694	.000077	9.021	.01	85.956
	$X1'^2$	-.000001	.000000	-6.749	.01	54,648.759
Physical handicaps	X6	.040593	.020138	2.016	.05	1.778
Household size	X8	.049549	.028888	1.715	.10	3.796
	$X8^2$	-.005893	.003205	-1.839	.10	16.820
Educational level	X12	.034783	.015291	2.275	.05	11.542
	$X12^2$	-.001367	.000713	-1.917	.10	141.222
Occupation	X13	-.000650	.000282	-2.307	.05	4.585
Income	X14	.000002	.000004	.502	.65	8,188.591
	$X14^2$	-.000001	.000000	-.776	.45	1,535,251,164.141

$R = .644$ 2/ $R^2 = .415$ 3/ $S_E = .380$ 4/ $F = 100.651$ 5/

1/ For 1,705 degrees of freedom.
2/ Multiple correlation coefficient.
3/ Coefficient of determination.
4/ Standard error of estimate.
5/ Significantly different from zero at the .01 level with 12 and 1,705 degrees of freedom.

Appendix Table 36. Matrix of correlation coefficients with Y' as the dependent variable for weekend trips

	Y'	X1	$X1^2$	X1'	$X1'^2$	X6	X8	$X8^2$	X12	$X12^2$	X13	X14	$X14^2$
Y'	1.00	.49	.09	.16	.13	.10	.02	.01	.16	.15	-.14	.09	.05
X1		1.00	.70	.14	.15	.07	.02	.01	.15	.15	-.09	.11	.07
$X1^2$			1.00	.07	.04	.02	.00	-.00	.06	.07	-.04	.03	.02
X1'				1.00	.80	.03	-.02	-.02	.09	.08	-.08	.10	.07
$X1'^2$					1.00	.02	-.01	-.02	.01	.01	-.03	.05	.04
X6						1.00	.09	.07	.11	.10	-.13	.07	.04
X8							1.00	.98	.11	.09	-.17	.08	.04
$X8^2$								1.00	.08	.07	-.14	.07	.04
X12									1.00	.98	-.26	.21	.10
$X12^2$										1.00	-.25	.23	.13
X13											1.00	-.19	-.09
X14												1.00	.95
$X14^2$													1.00