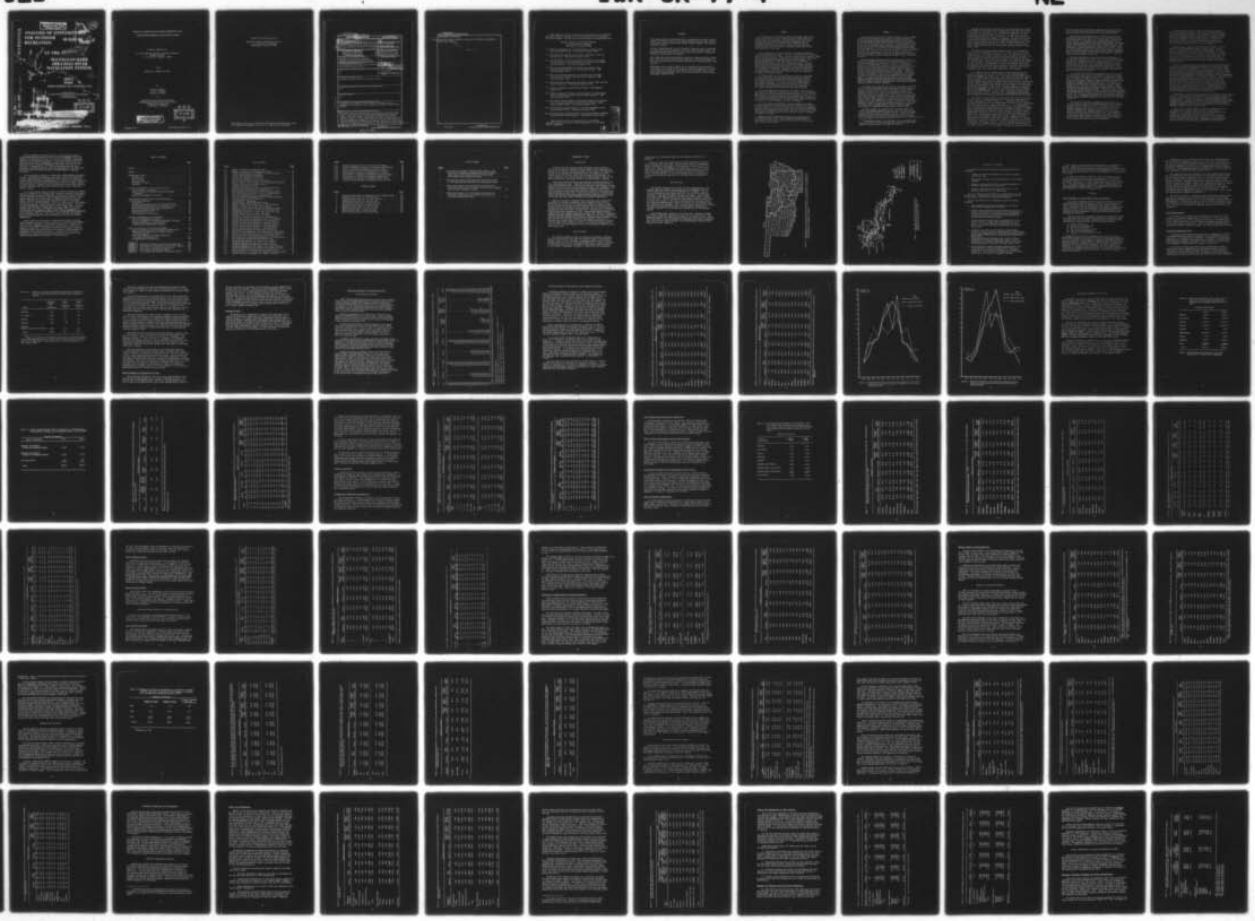
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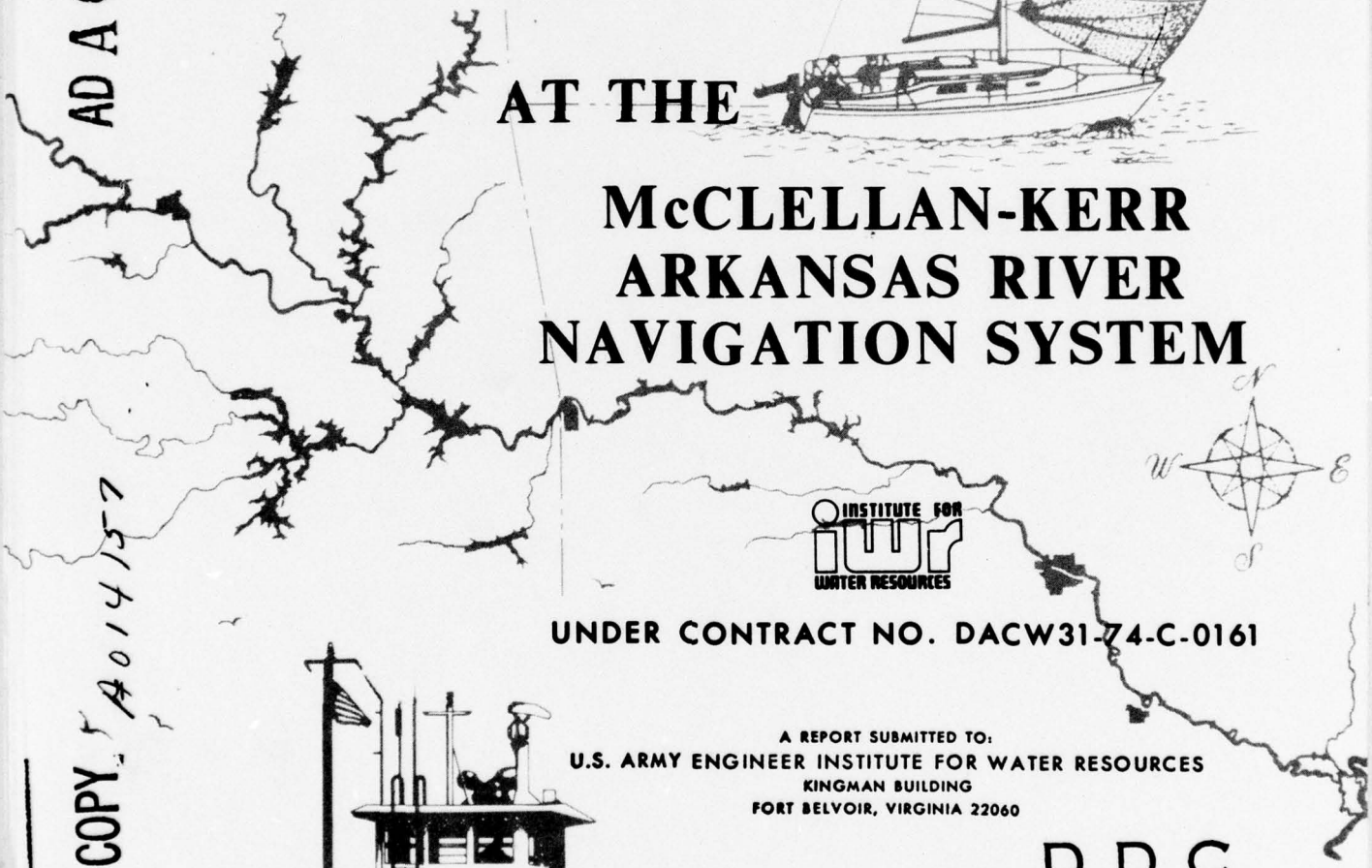
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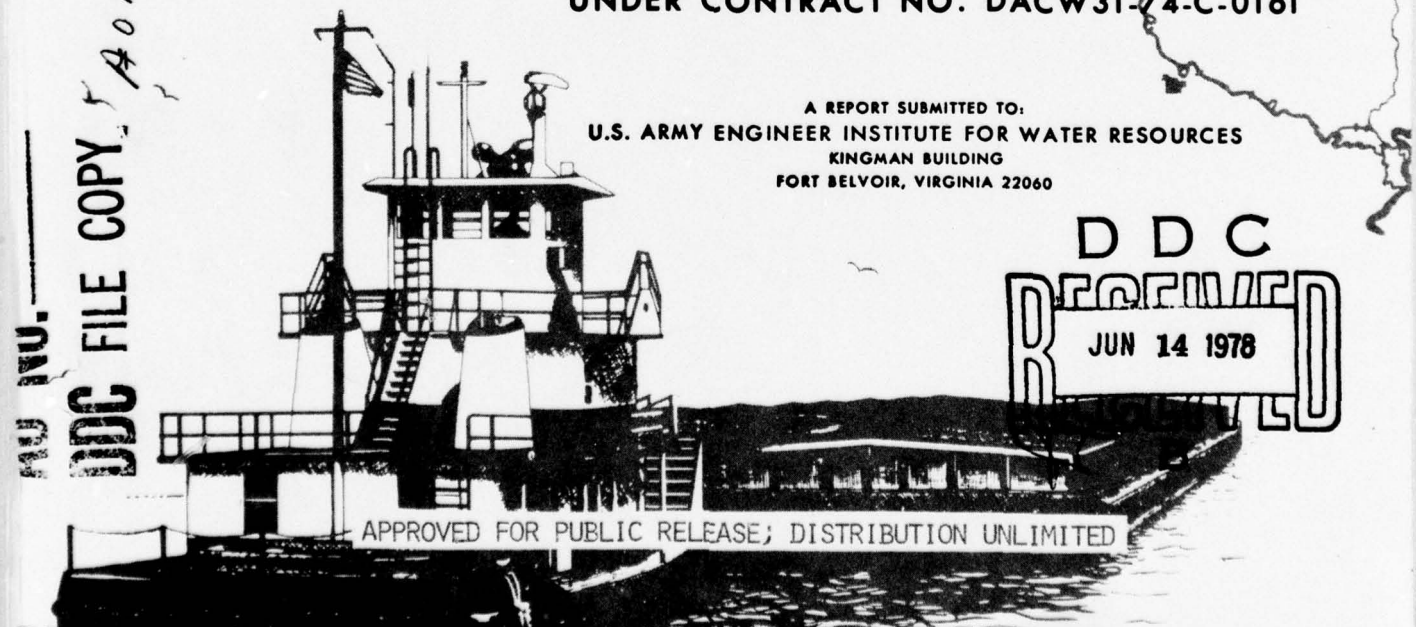
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A Report Submitted to:

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Kingman Building
Fort Belvoir, Virginia 22060

Under

Contract No. DACW31-74-C-0161

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ABSTRACT

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This report presents considerable data on expenditures for water-related outdoor recreation by users of McClellan-Kerr Arkansas River Navigation system. That system includes several multiple-purpose lakes and the navigation channel. Current recreational use is over 27 million visits per year, and expenditures average about $10 per visitor day, with visitors originating primarily from Arkansas and Oklahoma. Assessment of the economic impacts of the expenditure data gathered in this report will be made by the

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CONT. → Institute for Water Resources, utilizing a four region, interregional input-output model.

ABSTRACT

This report is one of a series of impact-studies by the Institute for Water Resources dealing with the McClellan-Kerr Arkansas River Navigation System. All the reports listed below may be purchased from:

National Technical Information Service
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Springfield, Virginia 22151

1.) "Recent Developments in the McClellan-Kerr Arkansas River Navigation System Area." IWR Research Report 77-R1

2.) "A Research Strategy for Social Impact Assesment: A Tale of Three Cities." IWR Contract Report 77-R2

3.) "An Application of the Interregional I/O Model for the Study of the Impact of the McClellan-Kerr Arkansas River Multiple Purpose Project." IWR Contract Report 77-2

4.) "Analysis of Expenditures for Outdoor Recreation at the McClellan-Kerr Arkansas River Navigation System." IWR Contract Report 77-4

5.) "Population Change, Migration and Displacement Along the McClellan-Kerr Arkansas River Navigation System." IWR Contract Report 77-5

6.) "McClellan-Kerr Arkansas River Navigation System: Hydroelectric Power Generation." IWR Research Report 77-R4.

7.) "A River, A Region and A Research Problem." IWR Research Report 71-6

8.) "Regional Response Through Port Development: An Economic Case Study on the McClellan-Kerr Arkansas River Project." IWR Contract Report 74-5

9.) "Evaluation of Interregional Input-Output Models for Potential Use in the McClellan-Kerr Arkansas River Multiple Purpose Project Impact Study." IWR Contract Report 74-6

10.) "Discriminant Analysis Applied to Commodity Shipments in the Arkansas River Area." IWR Research Report 74-R2

11.) "An Overview of the Impact Study of the McClellan-Kerr Multiple Purpose Arkansas River System." IWR Research Report 75-R3

These reports are not to be construed as necessarily representing the views of the federal government or of the Army Corps of Engineers.

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FOREWARD

This report presents considerable data on expenditures for water related outdoor recreation by users of the McClellan-Kerr Arkansas River Navigation system. That system includes several multiple-purpose lakes and the navigation channel.

Current recreational use is over 27 million visits per year, as compared to a few million visits projected in project authorization studies. Expenditures average about $10 per visitor day, with visitors originating primarily from Oklahoma and Arkansas.

Over 5,800 homes have been developed around the lakes and along the waterway. Many are primary residences and represent a substantial impact on land use and on the level of needed public services in predominantly rural counties.

Assessment of the economic impacts of the expenditure data gathered in this report will be made by the Institute for Water Resources, utilizing a four region, interregional input-output model developed from the 50-state multi-region regional input-output model produced for the Economic Development Administration.

PREFACE

The authors wish to express their appreciation to Mr. George Antle and Mr. A.J. Fredrich, Col. C.O. Eshelman, Col. Dan Ludwig, and Lt. Col. William Toskey, of the Institute for Water Resources for their efforts in initiating this study and for providing encouragement and advice throughout all phases of the research. Their cooperation and coordination efforts with the two District offices and with the Southwestern Division office of the Corps of Engineers facilitated the data collection phase of this study.

We also appreciate the close cooperation of the District Engineers of the two districts in the study: Col. John G. Driskill and Col. Anthony Smith of the Tulsa District and Col. Donald G. Weinert and Col. Charles C. Edgar of the Little Rock District. Thanks also go to those personnel who provided data and who assisted in making contacts with field personnel: Jerry O'Brien and John Sparlin of the Tulsa District office, and David Burrough and Robert Rutt of the Little Rock District office. All the resident and/or project engineers at the lakes and locks and dams were most cooperative and were especially helpful to the student interviewers from Oklahoma State University. Particular appreciation is expressed to Joe Callaway in the Dardanelle Resident office and Joe Irvin in the Pine Bluff Resident office for their time and patience in orienting us on Arkansas recreational patterns.

The authors also wish to recognize the efforts of the interviewers involved in the study. All these interviewers, students at Oklahoma State University, willingly spent many extra hours being drilled on interviewing techniques, the need for consistency in asking questions and in marking responses. Our thanks go to the 1974 interviewers, Carrie Bevers, Cheryl Harper, Kim Jones, Roger Parker, David Plaxico, Larry Walker, and Sherron Williams; and to the 1975 interviewers, Terry Jones, Nona Roman French, Glenn Patton and Donna Williams.

We wish to express our appreciation to Dr. James S. Plaxico, Department Head of the Department of Agricultural Economics, to Dr. James Whatley Associate Director of the Agricultural Experiment Station, and to Dr. Frank Baker, Dean of the Division of Agriculture at Oklahoma State University. The flexibility provided by these three administrators made it much easier to coordinate the regional study, involving extensive travel and interviewing time in the state of Arkansas, as well as in Oklahoma.

We wish to thank the Departmental Statistics laboratory personnel, under the direction of Mrs. Ginny Gann, and the OSU Department of Computer Science personnel for the accurate keypunching, verifying, and tabulating, and particularly for the rapid turn around time on our many job submissions. Personnel in the Department of Statistics, under the direction of Dr. Leroy Folks, provided valuable assistance in both 1974 and in 1975 in designing the sample for the study.

Finally, we wish to thank our secreatries, Mrs. Deborah Miller, Mrs. Deborah Doughty, and Mrs. Sandi Ireland for their patience in typing letters, survey forms, tables, and several drafts of this report. Their efforts are appreciated.

SUMMARY

Water recreation and related land based recreation, such as camping around lakes, have increased significantly in economic importance for the McClellan-Kerr Arkansas River Navigation System in recent years. Recreation attendance in the system increased from 10.9 million visitor days in 1965 to 25.7 million in 1974 and to 27.3 million in 1975.[a/] Had it not been for depressed economic conditions and high inflation rates in both the 1974 and 1975 recreation seasons, annual attendance likely would have been one to two million visitor days higher in each of those two years (1974-1975). As new facilities are added at several of the newer lakes and locks and dams, and as older facilities are renovated and upgraded at the older lakes in the system, the importance of recreation as a multiple purpose use will continue to increase in 1976 and succeeding years.

A major management problem associated with the greater use of the system's recreational facilities is the increasing imbalance in the overuse-underuse syndrome long prevalent at lakes in the southwestern region of the United States. The major use period is even more pronounced in this region--everyone wants to recreate between Memorial Day and Labor Day, but relatively few recreationists prefer the quiet solitude and beautiful weekends in March, April, and May or September after Labor Day, October and generally most of November. Evidently college and professional football, other TV entertainment, and children in school, all interact to cause virtual abandonment of the excellent complexes of recreational facilities available in these "off-season" months. Certainly the seasonal repetition patterns and clustering camping patterns of these recreationists belie the nationally advertised quest for a higher quality of life experience in the sense of solitude, seclusion and lack of traffic congestion.

As attendance has increased since 1965, the percentage of the total visits occuring in the summer recreation season also has increased, resulting in a double-barrelled effect on facilities, terrain, traffic patterns, and noise level. For the entire Navigation System, July attendance accounted for 16 percent of the annual total in 1974 and almost 18 percent of the annual total in 1974. About 43 percent of the total annual attendance occurred in the three month period June-August 1974; this percentage increased to 46 percent for the same three month period in 1975. Some suggestions for resolving this overuse-underuse syndrome are presented in the final chapter of the Report; they include upgrading of areas, off-season advertising, increased use of user fees and various other rationing schemes to prevent excessive numbers of recreationists from degrading the more popular recreation areas.

The socio-economic and expenditure data on recreationists and seasonal and permanent homeowners around the lakes and locks and dams in the system were obtained by personal interview. On-site and in-home personal interviews of about 30 minutes each were obtained from 1009 recreation groups in 1974, 1092 recreation groups in 1975, and from a total of 273 seasonal and permanent homeowners in both years (Tables 1.1 and 1.2)

[a/] The system includes 13 locks and dams, 4 main stem lakes (Webber Falls, Robert S. Kerr, Ozark, and Dardanelle) and five upstream lakes (Keystone, Oologah, Eufaula, Fort Gibson and Tenkiller).

Average one way distance traveled to the recreational area varied from 62 miles to 199 miles in 1974, depending on the lake, and from 48 to 153 miles in 1975 (Table 3.3). Fishing and camping were the major recreational activities engaged in, both in 1974 and 1975, for the interview period (Tables 3.7, 3.8 and 3.9). In 1975, about one-half of the recreationists also engaged in swimming. The most popular type of overnight accommodations for those camping overnight was a camper vehicle, rather than a local motel, cabin, or tent (Table 3.10). The median annual household income was in the $12,000 to $14,999 income class, considerably higher than the regional average household income (Table 3.13).

The size of recreation group ranged from 3.2 to 4.6 persons per group in 1974, depending on lake or area; in 1975, the size of group ranged from 3.0 to 4.8 persons (Table 3.15). The average size group in the system for the summer interview period was about 4 persons. The average length of stay per trip was 4.4 days in 1974 and 3.6 days in 1975 (Table 3.16). Some lakes in the system, e.g. Tenkiller and Eufaula, are characterized by longer travel distances and also by longer length of visit per trip. The importance of clean and adequate facilities was emphasized by recreationists in helping to encourage repeat visits. As indicated in Table 3.18, repeat visits are a major factor in the tremendous surge in recreational visitations in the systems.

For campers using fee camping areas around Corps lakes in the system, 65 percent in 1974 and 74 percent in 1975 did not object to paying the camping fee (Table 3.25). For campers using non-fee camping areas, 63 percent of the 1974 groups indicated they would be willing to pay a nominal user fee; this dropped to 43 percent in 1975. The greatest objections occurred at Lakes Keystone, Fort Gibson, and Oologah, all near Tulsa. Considerable publicity and controversy over user fees in the local newspapers in the spring and early summer of 1975 may have influenced these groups (Table 3.24). A related question on willingness to pay admission fees for use of the recreation area was asked of all on-site recreationists in 1975; almost 58 percent indicated they would be willing to pay an admission fee, if the money collected were used to improve and expand the recreation facilities in the local area.

The overall average expenditure per visitor day in the 1974 season was $5.10 for trip expenditures and $4.52 for annual expenditures for a total expenditure of $9.62 (Table 4.1). Comparable 1975 data were $6.01 per visitor day for trip expenditures, $3.53 for annual expenditures for a total of $9.54 per visitor day (Table 4.2). Trip expenditures refer to expenditures incurred during one particular outing for lodging, food and beverages, transportation, and recreation related activities. Annual expenditures for boating, fishing, skiing, and camping refer to expenditures incurred not only for that particular outing but for the entire year. These annual expenditures do not include investments in major recreation equipment items such as boats, campers and tents. Variations in expenditures among lakes appear to be generally randomly distributed and are not significantly different from each other within a particular expenditure category. Overall expenditure per visitor day is computed as a weighted average where lake or area visitation data are used as weights. The total weighted average for both years is about

$9.50 per visitor day, although trip expenditure is about one dollar more in 1975 than 1974 ($6.01 versus $5.10) and annual expenditure is about one dollar less in 1975 than in 1974 ($3.53 versus $4.52).

Aggregate recreation expenditures are estimated for the entire navigation system by multiplying average visitor day expenditures by the reported visitor days (Table 4.3). Visitor days are grouped into two time periods: (1) seasonal, May through September and (2) off-season, January through April and October through December. The survey results are statistically valid only for the recreation season. Off-season visitor day expenditures were assumed to be 60 percent of that estimated for seasonal expenditures using our survey results. During the off-season there would be less camping and boating but proportionately more fishing than during the main recreation season. Expenditure data by activity, however, does not show a great amount of variation between activites (Tables 4.4 and 4.5).

Aggregate expenditures are estimated at about $193 million for 1974 and about $224 million for 1975. The off-season expenditures are conservatively estimated and amount to about one-fourth of total annual expenditures. Recreation activity in Arkansas does not follow the Oklahoma seasonal pattern in that visitations in the Arkansas segment of the study area are more evenly distributed throughout the year with about 45 percent of the visitor days occurring during the October to April period and about one-third of the estimated annual expenditures occurring during this period.

An estimated 5,788 seasonal and permanent homes are located near the lakes and locks and dams in the system; 273 surveys were obtained from this group in 1974 and 1975. The 1974-75 average annual expenditure per household of seasonal residents for transportation, food and beverages, and utilities related to their recreational use of the corps projects was estimated at $1,210.58 (Table 4.6). Of this total, 77 percent was purchased within the general region of the River System. Expenditures for recreation activities of boating, fishing, skiing, camping, hunting, and other activities averaged $258.66 per household for seasonal and permanent home residents. About 69 percent of these expenditures were made within the region. Distribution between seasonal and permanent homes is assumed at 21 percent and 79 percent, respectively, for each of the lakes or areas although this varies substantially from lake to lake. The aggregate expenditure by all residences on boating, fishing, skiing, camping and hunting is also about $1.5 million annually (Table 4.7).

For on-site recreationists, equipment value per visitor day varied from $5.96 for the area "Arkansas Below Little Rock" to $23.32 for Lake Tenkiller (Table 4.8 and 4.9). The average is about $15.66. Equipment value per visitor day is not an estimate of the cost of equipment used up in that visitor or recreation day (see text of report for explanation). Equipment value per visitor day can be considered as the private "capital-output" ratio. Total aggregate value of recreation equipment is estimated at over $427 million for recreationists using recreation facilities in the system (Table 4.9). Recreationists using facilities at Lake Tenkiller have an estimated value of almost $122 million in recreation equipment.

In defining a capital-output ratio for recreation homeowners, output is not defined in terms of visitor days but rather in terms of a recreation season per household. Average value of recreation equipment per household is estimated at about $2,988 for seasonal residents and $1,720 for permanent residents (Table 4.10). The aggregate value of recreation equipment for all seasonal homeowners is about $3.6 million and $7.9 million for permanent homeowners. Assuming a 10 percent depreciation rate the annual value of recreation equipment used up is about $1,150,000 for all recreation homeowners.

Average value of constructed homes was about $19,000 for seasonal homes and $27,300 for permanent homes. Average value of lots was $4,700 for seasonal homes and $5,300 for permanent homes. The aggregate real estate value of the 5,788 seasonal and permanent recreation homes is estimated at about $146 million in current market value (Table 4.11). This is an average of over $25,000 per recreation home. Value of mobile and constructed homes represents the depreciable assets of recreation home real estate and is estimated at about $131.7 million. Assuming a 40 year life on such assets yields an annual depreciation of about $3 million.

For 1974 76.8 percent of total expenditures occurred within the defined local input area which includes three economic regions centered on Tulsa, Ft. Smith and Little Rock (OBIERS 117, 118, 119). The 1975 survey showed that 73.2 percent of total expenditures occurred within the region. The input-output sector distribution of aggregate expenditures for the recreation season of May through September is presented in Tables 4.12 and 4.13. The input-output sector distribution per dollar expended by on-site recreationists for trip and annual expenditures is indicated in colum two. Over $37 million was spent for food and kindred products in 1974 or about 26 cents of each recreation dollar. Almost $25 million was spent for petroleum products in 1974 or about 17.5 cents of each recreation dollar. For 1975, 30 cents of each recreation dollar was spent for food and kindred products and 23 cents for petroleum products. Input-output models are most frequently presented in producers' values. Under producers' value the wholesale and retail trade sector shows the largest expenditure value ($47 million in 1974 and $56 million in 1975) or about 33 cents of each recreation dollar in 1974 and 32 cents in 1975.

Recreationists expenditures impact directly on thirty-four different sectors. From 77 to 82 percent of the recreationists' dollar in producers' value come from six sectors: wholesale and retail trade; food and kindred products; petroleum products; finance and insurance; miscellaneous manufacturing; and, transportation and warehousing. Application of this expenditure data to interdependent input-output model, however, will demonstrate that recreationist expenditures impact not only directly on these thirty-four sectors but also indirectly on most all sectors in the economy.

The last four columns of Tables 4.12 and 4.13 indicate the recreation expenditures occurring within the region. Even though the expenditure occurred within the region it is not necessarily true that production of the commodity took place within the region. As an example, even though a major part of all gas and oil for motor boats was purchased within the study region, the major part of the gas and oil was produced outside the region. Interregional trade coefficients need to be applied to the recreation expenditures to determine the

local production impact. Nevertheless, some $36 million in 1974 and $41.5 million in 1975 of wholesale and retail trade services were provided within the study region. This sector alone indicates the substantial impact that recreationists have within the region. Furthermore, the trade occurring between regions emphasized the impact recreation development along the Arkansas Navigation System has, not only for this region but all other regions that produce recreation consumption goods.

As indicated in Table 4.17, total current expenditures for all input-output sectors is estimated at about $160 million within the region (column 5) and $59 million outside the region (column 10). On-site recreationists account for over 98 percent of total current expenditures. Current expenditures within the region are 73 percent of the total expenditures. Over $52 million or about 33 percent of the total expenditures in the region are accounted for in wholesale and retail trade services (Table 4.17).

The increase in visitor days for 1975 over 1974 of 1,613,200 means an increase in recreation equipment inventory and subsequently an addition to capital formation. Using $15.66 equipment value per visitor day results in an increase of about $13.9 million expenditures for capital formation within the region and $11.3 million expenditures outside the region for 1975. Total estimated expenditures for 1975 for capital formation accounted for about 19 percent of total current account recreation expenditures within the region and 34 percent outside the region (Table 4.17). Data were not available to compute capital formation from additions to stock of recreation homes. Neither was an estimate made on depreciation of recreation homes and a subsequent distribution to input-output sectors. An estimate of total direct recreation impact for the Arkansas River Navigation System region in 1975 is presented in columns (21) and (22) of Table 4.17. Estimated expenditures within the region are about $197 million and outside the region are $89 million, for a total of $256 million.

Both the Outdoor Recreation Resources Review Commission studies in the 1960's and this study have shown the need for additional and improved recreational facilities. This is becoming more apparent. Several trends can be noted that suggest an intensification of the level of recreational use of lakes and related land areas. On the national level, the trend toward a four day work week preceeded by shifting some holidays to allow 3 day weekends, essentially will make every weekend a three day weekend, providing more time for traveling. Increased levels of education, through high school and some college, and awareness of nearby recreational facilities tend to increase the demand for outdoor recreation. Increased levels of income will continue to provide more people with the financial means needed to recreate away from home. Reduced family size reduces the number of potential family conflicts, allowing more "noncommitted" weekends for the family. In addition, smaller families suggest higher levels of discretionary income. Already noticable is the extensive use of recreational amenities as a substantial component of regional & local advantages in industral location.

On the regional level, industrialization along the McClellan-Kerr Arkansas River Navigation System will likely attract new people and create new jobs, increasing both the local population base and income level, thereby increasing the number of potential recreationists. Improved highways will lead to increased participation and will lead to still further increases as more people become aware of the increased

recreational opportunities available to them within a few hours driving time. The population of nearby metropolitan areas continues to increase, resulting in even greater recreation pressures on these lakes. Establishment of rural water districts has enhanced the development of subdivisions around many of the lakes. These subdivisions are made up largely of permanent homes for retired couples as well as second homes for people living considerable distances from the lakes.

The primary purpose of this study was to estimate expenditures by users of the recreation facilities on the Navigation System. However, based on information learned from the study the authors would like to comment on other aspects of the study area. The envrionmental integrity of the recreational areas around the lakes is being threatened as insufficient facilities and developed areas exist to accommodate the heavy recreation use during the summer months. Several "overflow" areas have been designated to handle the crowds on peak use weekends.

According to the responses of the recreationists interviewed, there is a lack of facilities to accomodate the increasing number of camping type vehicles. Due to the increase in numbers of camping groups at these projects, recreationists are requesting more concrete pads and electrical hook ups at lake side campsites, as well as additional water hook ups and sanitary dump stations. Open pit toilets and the absence of shower facilities are also objectionable aspects to many of the recreationists interviewed at recreational areas where these flush type toilets and showers were not available.

Total resource management to insure maintenance of the environmental integrity of both the water and surrounding land recreation areas at these lakes and locks and dams must be emphasized. Overuse and abuse may eventually reduce the quality and value of the recreation experience if proper resource management and sufficient operational and maintenance funds are not provided. If that happens, then the future beneficial impacts of water and related land based recreation on both local and regional economies will be much smaller than now envisioned.

The Corps of Engineers management policies have changed in recent years to incorporate the philosophy and guidelines of the Principles and Standards of the Water Resources Council as adopted and published in the Federal Register on September 10, 1973. Specifically these guidelines require more emphasis on the Environmental Quality (EQ) objectives, as well as more public involvement in the decision making process as related to Federal development and management of water and related land resources.

Based on observations of the authors while on-site at the recreation areas included in this study, and based on comments made by many of the recreationists who were being interviewed, it is clear that Corps of Engineers Operation Personnel are emphasizing more the Environmental Quality objective which includes more intensive management of all the resources under Corps of Engineers jurisdiction. This includes the land resources and geologic type resources in the project areas, as well as the water resources.

Corps of Engineers personnel on-site at these projects need to continue emphasizing intensive natural resource management of all the resources in these project areas, as well as to accomodate increasing numbers of recreationists who desire to use the facilities and areas developed by the Corps of Engineers at these water resources projects. These two facets of resource management and public access can be reconciled or accomodated only if increased appropriations are made available to provide proper operation and maintenance of the facilities, including trash collection and repair and improvement of existing facilities.

The possibilitiy of joint or cooperative ventures between the public sector -- the Corps of Engineers in this case-- and private enterprise in developing additional recreational facilities needs to be explored. Perhaps similar type lease arrangements to the marina concession operations would work for selective types of facilities, such as for golf, tennis, or skeet shooting. However, private enterprise will seek only those very high use activities and those few locations where traffic volume will insure a profit.

On the other hand, public provision of outdoor recreation on federal lands is considered to be a public good, based on reports by the Outdoor Recreation Resources Review Commission, the Bureau of Outdoor Recreation and the National Park Service, and the Water Resources Council. Thus, federal agencies, such as the Corps of Engineers, which are already heavily involved in managing water resources projects for multiple purpose uses to include recreation, seem to be best-equipped and staffed to continue managing these projects for recreational uses. If this is generally agreed upon by federal agency policy makers, then it appears Congress and the Office of Management and Budget (OMB) will need to provide additional funding to insure proper resource management of these projects. Federal funds however, can be substantially supplemented by user and admission fees. The on site recreationists interviewed generally were favorable to fees if returned to the site for further improvements.

Current policy on recreation at Federal Water Reservoir projects stem from Public Law 89-72, which articulates a decision between Federal and non-Federal funding for construction & operations. Construction costs are to be dispersed equally, while non-Federal interest are to manage the facilities. This policy is difficult to apply on projects established under earlier policies which allowed Corps development and management of recreational facilities. Therefore, a very creative strategy must be developed to meet growing needs and to attract non-Federal participation in both public & private sectors.

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BACKGROUND OF STUDY

Introduction

The McClellan-Kerr Arkansas River Navigation System provides a natural study area for analyzing economic impacts, both regionally and nationally, of selected multiple purposes of the system. The Navigation Project on the Arkansas and Verdigris Rivers was completed in 1971; however, many of the final aspects such as sodding, rip-rapping, and road construction are still in process of being completed. Many of the needed recreational investments have not yet been funded or planned.

The Scope of Work written by the Institute for Water Resources for this study indicated that: "Completed research on the impact of the Corps of Engineers project indicates that recreation has assumed a significant role in the output of the completed project, and represents a significant portion of the investments directly induced by the project. Over 25 million visitor days were reported in 1974 for the project from Keystone Reservoir down river. Public use facilities at the reservoirs and on the waterway and accompanying facilities financed by the private sector have and will require substantial investment commitments."

Research personnel at Oklahoma State University have considerable experience in recreation demand and impact studies; particularly in water-based recreation and in regional development and impact studies. Earlier studies by OSU Agricultural Economics research scientists were accomplished on SCS projects in 1960 and 1964, and on Corps of Engineers projects in 1966, 1970, 1972, 1973 and 1974. Concurrent projects for the Tulsa District were completed in 1975. Regional development research projects have been underway continuously since 1968. With this recreation research expertise already working in the region, it was thus a stroke of good forture that Oklahoma State University personnel were available in 1974 when the Institute for Water Resources was seeking a contractor to determine the economic impact of water and related land based recreation in the Arkansas River Navigation System. The contract was approved on June 27, 1974, and interviewing of on-site recreationists began less than three weeks later.

Need For Study

No detailed expenditure data or recreational equipment investment data were available for the lakes and locks and dams in the navigation system. Thus, no valid estimates of aggregate impacts could be made; generalizations such as the "increasing importance of outdoor recreation at Corps projects" did not completely satisfy budget review personnel in the Office of Management and Budget. Neither did such statements

provide specific information needed by recreational developers and planners.

Results of this study should provide timely information useful to policy planners and other public agency decision makers in programming needed recreational investments on this regional project as well as for public water resource developments in other areas. It is particularly important to analyze the regional and national implications of tourism and recreational expenditures in the area resulting from changes in traffic flow patterns due to the attractability factor of the many new recreational facilities constructed in the McClellan-Kerr Navigation System.

The Study Area

The overall objective of the study was the determination of the economic impact of outdoor recreation at Corps of Engineers lake and lock and dam projects on the area designated as "In Region", that is Bureau of Economic Analysis (BEA) Areas 117, 118 and 119 as indicated in Figure 1, and also the impacts outside this region. Each of these three SMSA's has been gaining in both population and economic activity in recent years. There is an obvious relationship between the east-west IH 40 and the location of new motel-convention-marina complexes where the Interstate Highway bisects and/or is adjacent to the waterway, such as at Russellville, Arkansas. Also, IH 30, a direct route from the Dallas-Fort Worth area through Little Rock, has undoubtedly exposed many "through travelers" to the recreational possibilities of the waterway project.

The Oklahoma lakes included in the study were: Keystone, Oologah, Fort Gibson, Tenkiller, Eufaula which were not on the main stem of the navigation system; the large locks and dams on the main stem e.g.) Webber Falls and Robert S. Kerr in Oklahoma and Dundanelle and Ozark in Arkansas: and, also the other locks and dams in the McClellan-Kerr Arkansas River Navigation System. (Figure 2).

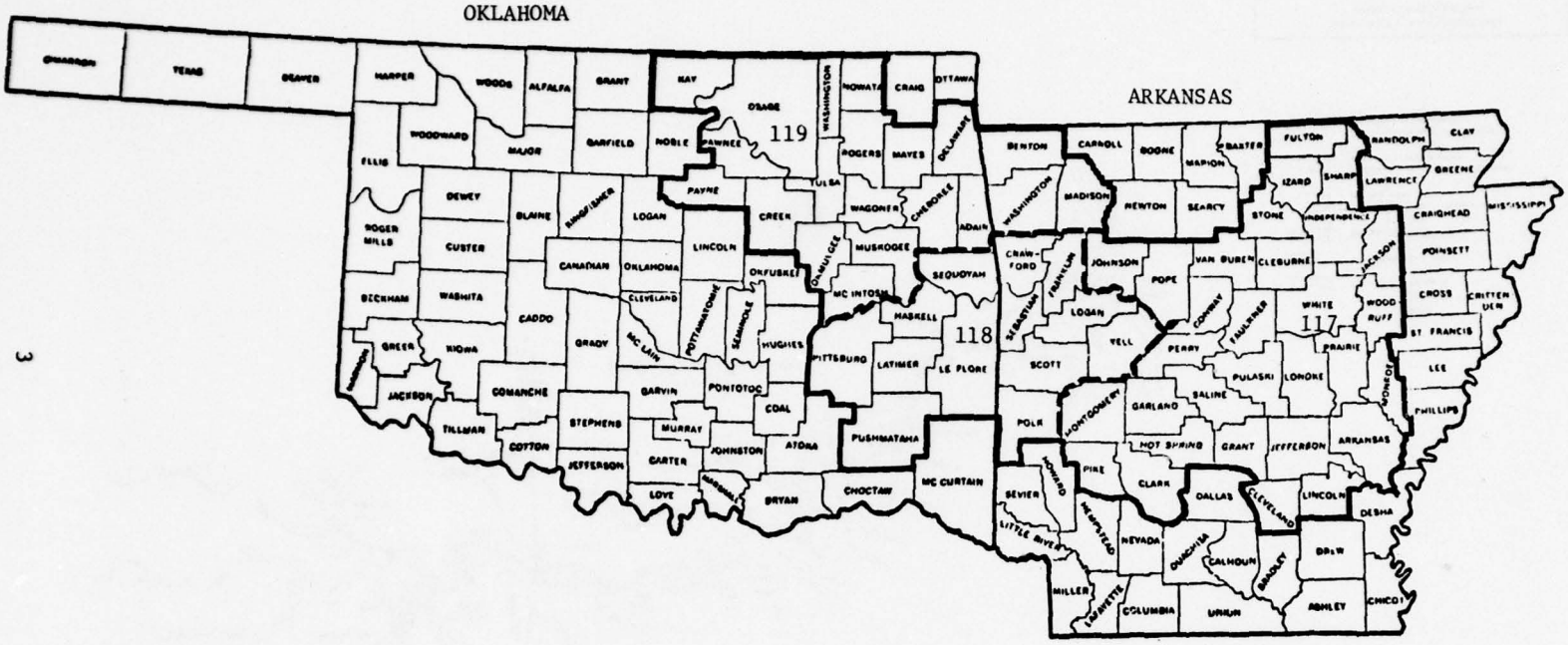


Figure 1: Three Bureau of Economic Analysis Areas (BEA 117, 118, and 119) in Arkansas and Oklahoma Used as "In Region" Impact Area for Recreation Study of the McClellan-Kerr Arkansas River Navigation System.

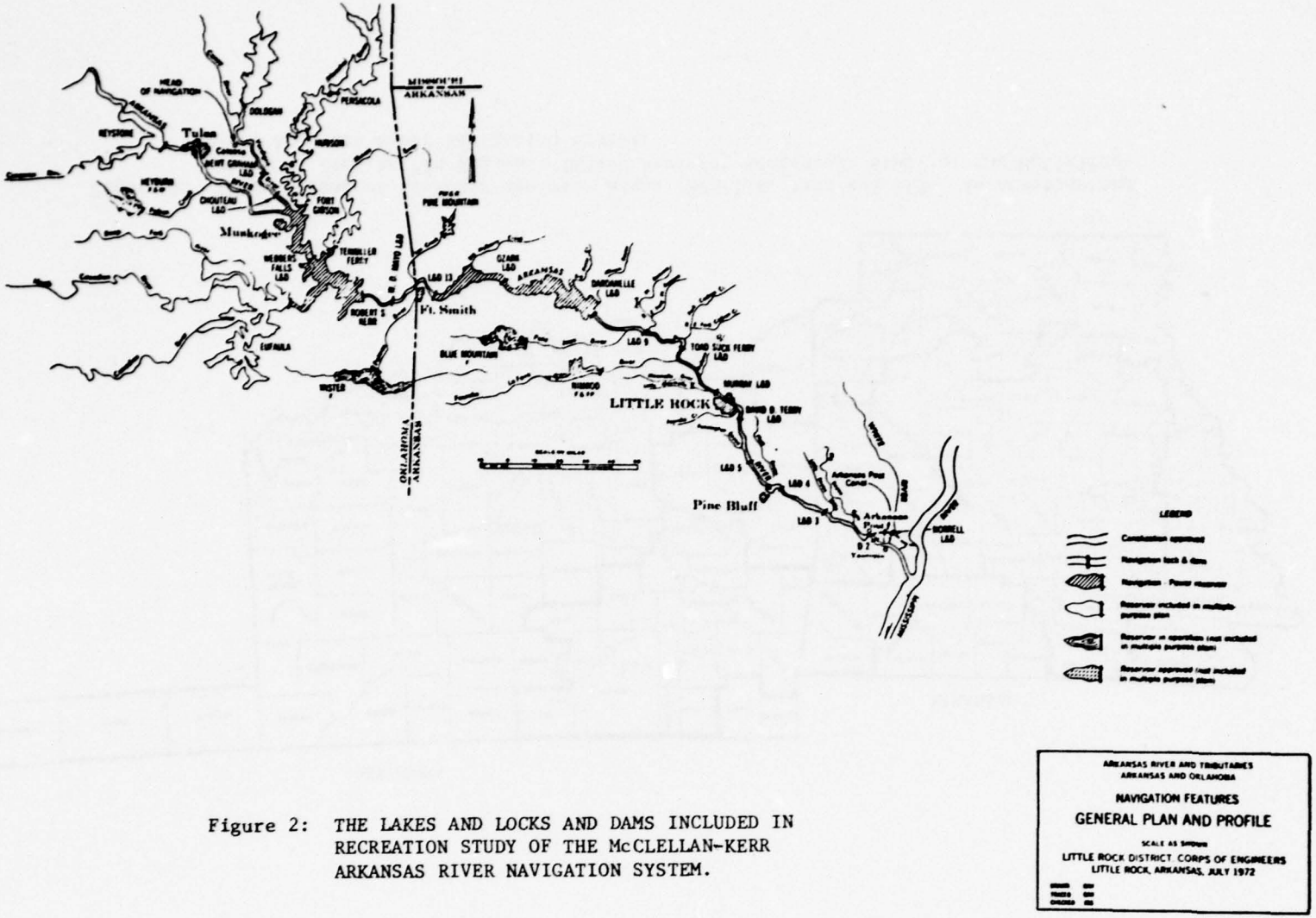


Figure 2: THE LAKES AND LOCKS AND DAMS INCLUDED IN RECREATION STUDY OF THE McCLELLAN-KERR ARKANSAS RIVER NAVIGATION SYSTEM.

Objectives of the Study

As indicated in the Scope of Work for the study objectives were as follows:

1. estimate the consumption expenditures for outdoor recreation in the study area.

2. estimate the investment or capital expenditure for recreational equipment.

3. estimate a trade flow matrix for the recreation industry for the three BEA regions in the study area.

4. propose the methodology for estimating trade flows in the recreation industry for the 44 region model.

All of the objectives except number 4 are analyzed within the body of this report. The methodology for estimating trade flows in the recreation industry (objective 4) is presented in Appendix B.

Specific sub-objectives were accomplished to satisfy the above objectives:

1. obtain historical recreation attendance data, and current (1974 and 1975) seasonal data by activity.

2. design a survey instrument that would provide not only socio-economic characteristics and preferences of recreationists, but detailed trip, annual, and equipment investment expenditures by category that would match up with the 83 sectors in the Harvard University input-output model.

3. design a statistical sample based on visitation data by lake and lock and dam, to insure proper representation of each project, and to allow aggregation of the sample data on the basis of the 1974 and 1975 total attendance data by lake and lock and dam.

4. establish a time table for interviewing to insure adequate coverage of the most important recreational areas at each project, and to obtain seasonal balance over the "tourist-season" interview period, generally Memorial Day to Labor Day in the Southwestern United States.

5. Coordinate editing and validation of each survey to insure minimum delay in coding and keypunching. Based on the 1974 experience, the 1975 survey forms were revised to allow coding and keypunching directly from the interview or survey form.

6. develop and debug a computer program to handle the many types of data obtained. Qualitative characteristics had to be quantified; raw data had to be converted, i.e., multiplied, divided, etc., to obtain the "per visitor day" and "per recreation group" results needed for aggregation purposes.

This contract study provided a unique opportunity to systematically develop a large-scale data flow effort to measure recreation related impacts. Building blocks were developed and aggregation techniques devised that will facilitate future recreation oriented management and policy studies. Other researchers should benefit by some of the methods devised and tested in the study.

The objectives analysed in this study were top recreation research priority needs at the time the contract was initiated. Several other recreational aspects of this waterway system deserve early future study. For example, development of a supply response-production function relationship of the recreation sector would provide vitally needed information to Corps of Engineers planners in matching up future recreation needs with the geographically available supply. It is hoped that the Institute of Water Resources will pursue this research need.

Procedure

Survey Instrument for Interviewing On-Site Recreationists

The survey instrument used for the personal interviews with on-site recreationists was a modified version of earlier surveys developed and used by the senior author for demand and economic impact studies on several SCS projects and Corps of Engineer lakes, primarily Texoma and Tenkiller. The survey form had been approved by the Oklahoma Agricultural Experiment Station in 1972 as a certified, confidential interview from, authorized for use by Department of Agricultural Economics personnel at Oklahoma State University.

That survey form was reorganized, and detailed expenditure questions were inserted to allow a more accurate accounting of recreationist expenditurys by sector of the economy. Information on the recreation survey instruments was generally grouped under the following headings:

(1) General Information
(2) Personal Socio-economic Data
(3) Recreation Expenditures
(4) Recreational Equipment Inventory
(5) Site Preference and Opinions
(6) Frequency and Distribution of Visits

Construction of the survey instruments with respect to recreation expenditures was important to make valid estimates of aggregate expenditures for the river navigation region and to be able to allocate expenditures to input-output sectors. Valid estimates of aggregate expenditures is based on obtaining estimates of expenditures per visitor day from a representative sampling of the total visitor day population. The survey instrument was constructed in a manner to reduce expenditures for the recreation group interviewed to an expenditure per visitor day. This statistic is then applied to the Corps of Engineers reported visitor days to obtain an estimate of aggregate expenditures.

Expenditures on the individual questionnaires were disaggregated to some 48 separate categories on line items. Categories were determined on the basis of interviewees' expected ability to recall information and on the basis of being able to allocate to individual input-output sectors. Recreation equipment inventory was also disaggregated to some 15 separate categories. The appendix contains the procedures for allocating expenditure categories to individual input-output sectors.

The survey form also was arranged so we could determine what percent of the expenditures were purchased within the delineated region and what percent were purchased outside the region. Each interviewer was given a map on a clipboard of the delineated region. The interviewer and the recreationist then determined whether the expenditure occurred within the region or outside the region. Based on the learning experiences in taking the 1974 surveys and editing, coding, and keypunching the data, the authors revised the survey form for 1975 to allow direct coding by the interviewer, and key punching directly from the survey form. Also, a few questions were changed and/or added on the 1975 survey. A copy of the 1975 survey form is presented in Appendix D.

The survey form used to interview seasonal and permanent home owners also was a revised version of an earlier form approved by the Oklahoma Agricultural Experiment Station for a Corps of Engineers contract study of Lake Tenkiller. Sections were added to obtain detailed expenditure data, on the same basis as that obtained with the on-site recreationists' survey form. A copy of the seasonal and permanent home owner survey form is in Appendix E.

Sample Survey Design

The purpose of the sample survey designs was to provide a valid estimate of recreation expenditures for the typical visitor day, which could be expanded by the total reported visitor days. The expenditures of the typical household of the recreation home owners could be expanded by the total number of homeowners. Since the sampling procedures are different for the two population groups, they will be described separately.

Sampling at Recreation Areas

A completely random sampling design such as stopping every 10th car at randomly determined times at randomly selected recreation areas was deemed to be too expensive and infeasible. Consequently we worked with Statisticians at Oklahoma State University to construct a sample design which would be feasible to administer in the field and would provide a valid estimate of expenditures for a typical visitor day.

For the 1974 survey we perceived that a problem would exist in selecting the right combination of recreationists engaged in various activities, such as camping, boating, fishing, etc., to provide an estimate for the typical visitor day. We envisioned bias entering in the selection process of who to interview since it may be more convenient

to interview campers around the evening fire then fishermen out in a boat or on the banks in the hot sun. Therefore, the sampling procedure for 1974 included interviewing a given number of recreationists in each major recreation activity. The 1975 sampling procedure was modified based on our 1974 interview experience and analysis of the 1974 results. A detailed discussion of both the 1974 and 1975 sample procedures is presented in Appendix A. The total number of on-site recreationist groups surveyed in 1974 and 1975 is presented in Table 1.1.

Sampling at Seasonal and Permanent Recreation Homes

During the 1974 season we had to determine the population of seasonal and permanent recreation homes. No centrally organized system is available for monitoring the building of recreation homes around the lakes and along the waterway. Most of the resident or project engineers keep a map of development areas around their project. Residences, businesses and recreation facilities such as boat docks and storage are located on these maps. From these maps and discussions with project managers we estimated the number of residences for the major projects.

The sampling procedure was loosely defined for the first year because of a lack of knowledge on the total population size. The procedure was to randomly select about one-fourth of the development areas that had been identified and then have the interviewers survey every fourth or fifth house within the development area depending on the size of the area.

We had arbitrarily set the sampling rate at about 5 percent for the first year of the known areas knowing that we would not be able to identify all areas until we had individually visited each lake and talked with the project engineer. The total number of interviews taken each year and the population of residences is presented in Table 1.2.

On-Site Recreationist Interviewing Techniques

Due to the time element, and the need to obtain 1,000 interviews in the two remaining tourist season months (July and August) of 1974, seven OSU student interviewers were hired; three of those worked part-time (week-end only) and four worked full time. In 1975, only four student interviewers were hired full time, since we had a full recreation season in which to obtain the needed number of interviews.

The interviewers were throughly briefed and trained each year in how to ask questions, how to record responses, how to probe for answers in a respectful way, and how to handle responses to a sensitive question (age, income, education, marital status all had sensitive connotations to some recreationists). The senior researchers (authors of this report) interviewed recreation groups so the student interviewer could observe the proper procedures. Introductory remarks concerning the nature of the study and the confidentiality of the data were practiced and memorized by the interviewers. For the entire study (2,111 on-site recreationist interviews and 273 homeowner interviews), the rejection or turn down rate of individuals who refused to be interviewed was less than 3 percent.

Table 1.1: Number of Recreation Groups Surveyed, by Lake or Area, and Total, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

Lake or Area	1974	1975
Keystone	82	151
Fort Gibson	237	146
Eufaula	140	150
Tenkiller	310	193
Oologah	61	88
Oklahoma Main Channel [a/]	26	65
Arkansas Above Little Rock [b/]	100	181
Arkansas Below Little Rock [c/]	53	118
Total	1009	1092

a/ Oklahoma Main Channel includes Newt Graham L & D, Choteau L & D in the Verdigris River, and Robert S. Kerr Lake And Webber Falls Lake, and W. D. Mayo L & D on the Arkansas River.

b/ Arkansas above Little Rock includes L & D 13, Ozark Lake, Dardanelle Lake, L & D 9, Toadsuck Ferry L & D and Murray L & D on the Arkansas River.

c/ Arkansas below Little Rock includes David D. Terry L & D, L & D 5, L & D 4, L & D 3 and L & D 2 in the Arkansas River and Norrell L & D on the White River.

Table 1.2: Number of Seasonal and Permanent Home Owners Surveyed in 1974 and 1975, McClellan-Kerr Arkansas River Navigation System

Lakes	Estimated Number of Residences	Number of Interviews 1974	Number of Interviews 1975
Keystone	604	22	41
Ft. Gibson	1,465	51	24
Eufaula	2,432	53	24
Tenkiller	995	5[a]	30
Arkansas (Above or Below Little Rock)	292	9	14
Total	5,788	140	133

[a] Since 127 seasonal and permanent home owners had been interviewed around Lake Tenkiller earlier in 1974 (April, May and June) for another study by the Department, it was decided not to survey intensively at that lake in 1974.

The actual interview process took approximately 30 minutes; this varied from 15-20 minutes if only one activity was involved, to as long as 45 minutes or longer for some talkative respondents who enjoyed being interviewed!

The interviewers generally traveled two per car. The car would be parked near the center of a recreational area, and the interviewer would approach the recreation groups on foot; however, the state owned car with official window seals and government license plates usually was visible to the group being approached. This association generally helped associate the interviewer as being in an official capacity. In addition, all interviewers wore plastic identification tags on their shirts or blouses, and always gave the recreationist his or her name and department and University connection.

The interviewers were trained in how to randomly select recreation groups within a recreational area (camping, picnicking, fishing, swimming, etc.). In 1974, we attempted to stratify the sample by major activity, so interviewers were more activity-oriented in their selection process to insure a certain number of camping interviews, fishing interviews, etc. After analyzing the 1974 results, it was determined that most recreationists engage in several activities during each trip, so the actual selection of on-site recreation groups in a given recreation area to interview was even more random in 1975.

The number of surveys needed were predetermined for a specific lake or lock and dam for that time period (the time periods generally were May 15 to June 15, June 16 to July 15, and July 16 - September 1 for Oklahoma; and May 15 - July 1 and July 2 - September 1 for Arkansas.) Then the interviewers traveled to the recreational areas selected by the statistical randomization process (weighted by visitor days for that recreational area) and interviewed groups until the number of interviews needed were obtained.

Since two-thirds to three-fourths of the visitations generally occur on week-ends (Friday noon through Sunday afternoon), the interviewers attempted to obtain about 70 percent of the interviews needed at a lake or lock and dam during that week-end period. It was learned from the 1974 interviewing experience that it was almost impossible to find sufficient recreationists to allow for productive interviewing on Mondays and Tuesdays. Thus, the interviewers generally had these days off, and/or used these days for travel to new areas. Sometimes they returned to Stillwater for briefings and consultations to improve recording and interpretation techniques, based on items encountered in the editing and keypunching process of surveys already obtained.

Related Comments on Coordination of Study

An interesting sidelight is that due to the large geographic area, over 500 miles from Oolagah Lake in northeast Oklahoma to Norrell lock and dam near the Mississippi River, as well as the configuration and size of some of the lakes (Eufaula Lake covers 106,000 surface acres and

has over 600 miles of shoreline) the interviewers traveled slightly over 20,000 miles in each year. Thus, each survey represented about 18 miles of travel (2,111 + 273 = 2,384 interviews and 41,789 miles traveled). Several survey pretests and interviewer training trips were made to Keystone Lake, as well as two coordination trips (one in each year) to each lake and lock and dam in both Oklahoma and Arkansas, by the three authors. In addition, the researchers flew the river system by University plane and stopped in Little Rock to coordinate the study with the District Corps of Engineer personnel in that state. Several trips also were made to the Tulsa District to coordinate the Oklahoma portion of the study and to obtain needed attendance data.

Analysis of Data

The methods used to aggregate and analyze the survey data, and to develop the appropriate input-output statistics are described in the results chapters. As already indicated, considerable time was spent in writing the specific programs and in debugging these programs until we finally developed a very smooth-running computer program that was used to make multiple runs, by lakes, by area, and by total. Due to standardization and common knowledge of computer programs, such as SAS, developed by North Carolina State University, it is not necessary to discuss the analytical ability of the SAS program used for the study.

RECREATION ATTENDANCE IN THE NAVIGATION SYSTEM

Past Attendance and Trends

Water recreation and related land based recreation such as camping around lakes, have increased significantly in economic importance for the McClellan-Kerr Arkansas River Navigation System in recent years. Oklahoma and Arkansas have become a water mecca for recreationists, with the completion of the lakes and locks and dams in the System and the development of public recreational facilities by the Corps of Engineers and by other public agencies (State Parks), and by private operators leasing areas for marina facilities.

Recreation attendance for the lakes and locks and dams in the System has increased dramatically in recent years. Annual visitations, measured in visitor days were 4.2 million in 1955, 6.1 million in 1960, and 10.0 million in 1965 , the first full year of operation for Keystone , Oologah, Dardanelle and Eufaula Lakes.

As other locks and dams were completed and added to the System, and with the big recreation boom of the late 1960's and early 1970's, visitations increased to 14.7 million in 1970, to 25.7 million in 1974, and to 27.3 million in 1975. Had it not been for higher gas prices, high inflation rates, and depressed economic conditions in both the 1974 and 1975 recreation seasons, annual recreation use likely would have increased an additional one to two million visitor days in each of the last two years.

It should be indicated that in recent years about 35 percent of the total visitations have occurred at Tenkiller and Ft. Gibson Lakes. (Table 2.1) Investment in recreational facilities at these two lakes by the Crops of Engineers, by the State Parks Department and by both private businesses and recreationists (seasonal and permanent homes, boat docks, etc.) has been significant and was accomplished primarily before the federal money crunch of the late 1960's and early 1970's.

Planned recreational developments on some of the new lakes and locks and dams in the System were delayed two to three years due to federal capital investment cutbacks. Rising costs of construction also limited the number of facilities that could be built with limited appropriations. Many of the facilities at recreational areas on the lakes and at the locks and dams were completed in 1974 and 1975, and more are scheduled for completion in 1976. As these public facilities are completed, and as the local supportive businesses (dry boat storage facilities, marinas, service stations and stores, etc.) are built, the recreation impact of the System should become even greater in the next few years. Future recreational developments likely will be more difficult to construct, due to the cost sharing requirements for recreational facilities in the Federal Water Projects Recreation Act (PL89-72) and subsequent public laws and Office of Management and Budget (OMB) regulations.

Table 2.1: Visitor Days Recreation Attendance, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1950-1975

(Figures in 1,000)

Year	Keystone	Ft. Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock	Total
1950	-	195	-	45	-	-	-	-	240
1951	-	489	-	93	-	-	-	-	582
1952	-	780	-	67	-	-	-	-	847
1953	-	1,287	-	552	-	-	-	-	1,839
1954	-	2,163	-	1,155	-	-	-	-	3,318
1955	-	2,746	-	1,413	-	-	-	-	4,159
1956	-	3,707	-	1,866	-	-	-	-	5,573
1957	-	3,998	-	2,130	-	-	-	-	6,128
1958	-	4,178	-	2,298	-	-	-	-	6,476
1959	-	4,213	-	2,398	-	-	-	-	6,611
1960	-	3,782	-	2,284	-	-	-	-	6,066
1961	-	3,512	-	1,627	-	-	-	-	5,139
1962	-	3,736	-	1,841	-	-	-	-	5,577
1963	-	2,479	-	1,663	324	-	-	-	4,466
1964	479	2,806	168	1,636	719	-	-	-	5,808
1965	1,582	2,466	2,305	1,782	1,148	-	1,589[a/]	-	10,872
1966	2,001	2,427	2,158	1,842	937	-	1,318	-	10,683
1967	1,794	2,112	2,002	1,373	1,178	-	1,217	-	9,676
1968	1,833	2,406	2,313	1,466	1,093	-	1,034	-	10,145
1969	2,152	2,672	2,766	1,804	1,057	-	1,277	1,027	12,755
1970	2,440	2,937	3,215	2,311	966	-	1,559	1,266	14,694
1971	2,585	3,116	3,982	2,361	884	304[c/]	2,693[b/]	1,874	17,799
1972	2,893	4,419	4,602	3,096	1,103	1,093[d/]	2,811	2,417	22,434
1973	3,138	4,008	4,522	4,055	1,326	1,172	3,413	2,462	24,096
1974	3,674	4,083	4,562	5,002	1,219	1,317	3,729	2,080	25,666
1975	3,022	4,110	4,695	5,226	1,421	2,128	4,330	2,348	27,280

Source: These visitation data were obtained from the Tulsa and Little Rock Districts of the U.S. Army Crops of Engineers.

[a/] Beginning of Lake Dardanelle

[b/] Beginning of Ozark Lake, L & D #13, L & D #9, Toadsuck Ferry L & D, Murray L & D

[c/] Beginning of Robert S. Kerr Lake and W.D. Mayo Lock and Dam

[d/] Beginning of Webbers Falls Lake, Newt Graham L & D and Chouteau L & D

Monthly Patterns in Recreation Use and Seasonal Variations

A different seasonal use pattern is evident for the recreational areas in the Arkansas (state) segment of the navigation system. As indicated in Tables 2.2 and 2.3, the peak or high attendance month for the entire system is July. However, analysis of the dates for the area "Arkansas Above Little Rock" indicates that for 1974, August was the peak month, followed closely by July, March, May and October. In 1975 for that area, June was the peak month, followed by July, August and then May and April. Similarly for the area "Arkansas Below Little Rock," in 1974, August followed by June were the top months; in 1975, May was most important. Fishing is the favored activity in Arkansas in the navigation system, and both spring and fall (May and October) appear to be good fishing months in the river system lakes and locks and dams in Arkansas. Similarly, hot weather causes a period of poor fishing particularly in the river and lakes during the Navigation System in Arkansas: the drop off in attendance for the area below Little Rock for July in both 1974 and 1975 is an indication of the importance of fishing along that part of the Navigation System.

Vivid illustrations of the variations in seasonal attendance patterns for 1974 and 1975 are evident in Figures 3 and 4. For the entire navigation system, July visitations represented 16 percent of the annual total in 1974 and almost 18 percent in 1975. August was the second highest month of use in 1974, followed by June. In 1975, June was the second highest month, followed by May.

It is particularly interesting that at Ft. Gibson Lake in 1975, over 27 percent of the annual visitations occurred in July (Figure 3). Similarly almost 22 percent of the annual visitations at Lake Tenkiller in both 1974 and 1975 occurred in July. This indicates a real crunch on facilities and adverse physical environmental impacts and adverse quality of life impacts for recreationists visiting the lake in that period. It also means gross underutilization of the recreation areas and associated facilities throughout most of the year. This poses a critical management problem which needs to be addressed by Corps of Engineers policy planners. Some suggestions for resolving this "overuse-underuse syndrome" are discussed in Chapter V.

The three BEA areas were specified as "Inside Region" or "Within Region" for locations of residence and expenditure purposes. Forty counties in Arkansas and 23 counties in Oklahoma are within the region. All other counties and/or states were designated as "Outside Region". These counties are shown in Figure 1.

Table 2.2: Visitor Days Recreation Attendance, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974

(Figures in 1,000)

Month	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock	Monthly Total
January	76.1	115.5	190.5	129.4	24.1	41.3	123.3	66.7	766.9
February	83.1	182.6	242.9	143.9	49.0	53.8	246.8	147.6	1,149.7
March	171.2	385.9	428.4	236.2	106.8	87.5	381.7	144.7	1,942.4
April	223.2	366.8	378.7	394.2	95.8	101.3	318.9	165.2	2,044.1
May	438.4	413.6	453.8	707.6	251.0	172.2	379.4	256.2	3,072.2
June	612.9	473.8	676.0	669.6	172.0	229.3	328.6	314.5	3,476.7
July	724.5	579.2	709.1	1,072.6	155.1	167.9	382.4	204.8	3,995.6
August	755.1	392.1	513.7	798.9	125.8	155.3	444.2	348.0	3,533.1
September	292.8	349.2	312.3	235.4	100.2	103.7	340.8	146.2	1,880.6
October	114.3	293.7	265.8	293.0	71.1	100.8	376.2	139.1	1,654.0
November	105.9	379.7	223.8	214.1	43.2	65.5	198.1	83.2	1,313.5
December	76.7	151.0	167.4	106.6	24.8	38.4	208.9	63.9	837.7
Total	3,674.2	4,083.1	4,562.4	5,001.5	1,218.9	1,317.0	3,729.3	2,080.1	25,666.5

Source: These data were obtained from the Tulsa and Little Rock Districts of the U. S. Army Corps of Engineers.

Table 2.3: Visitor Days Recreation Attendance, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1975

(Figures in 1,000)

Month	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock	Monthly Total
January	76.7	146.0	153.1	152.0	115.4	85.7	214.9	88.5	1,032.3
February	78.7	96.0	124.2	193.2	29.9	61.6	164.7	102.7	851.0
March	134.5	168.1	247.3	223.2	60.9	117.8	256.0	139.8	1,347.6
April	237.2	263.8	318.5	436.9	116.4	191.9	424.3	276.1	2,265.1
May	509.0	471.9	563.2	791.9	219.6	277.4	464.4	411.6	3,709.0
June	375.5	557.1	915.0	947.0	215.5	272.7	560.1	238.4	4,081.3
July	584.6	1,113.3	713.8	1,147.5	183.1	305.8	542.8	312.5	4,903.4
August	447.7	454.5	657.3	670.1	244.3	261.3	537.3	244.2	3,516.7
September	258.6	333.9	372.2	234.3	97.0	191.5	359.6	133.9	1,981.0
October	158.2	142.1	299.1	169.7	87.3	167.2	334.2	114.6	1,472.4
November	103.4	272.6	237.2	191.4	37.1	131.0	240.0	142.8	1,355.5
December	57.6	90.9	93.6	69.1	14.6	64.3	231.5	142.8	764.4
Total	3,021.7	4,110.2	4,694.5	5,226.3	1,421.1	2,128.2	4,329.8	2,347.9	27,279.7

Source: These visitation data were obtained from the Tulsa and Little Rock Districts of the U.S. Army Corps of Engineers.

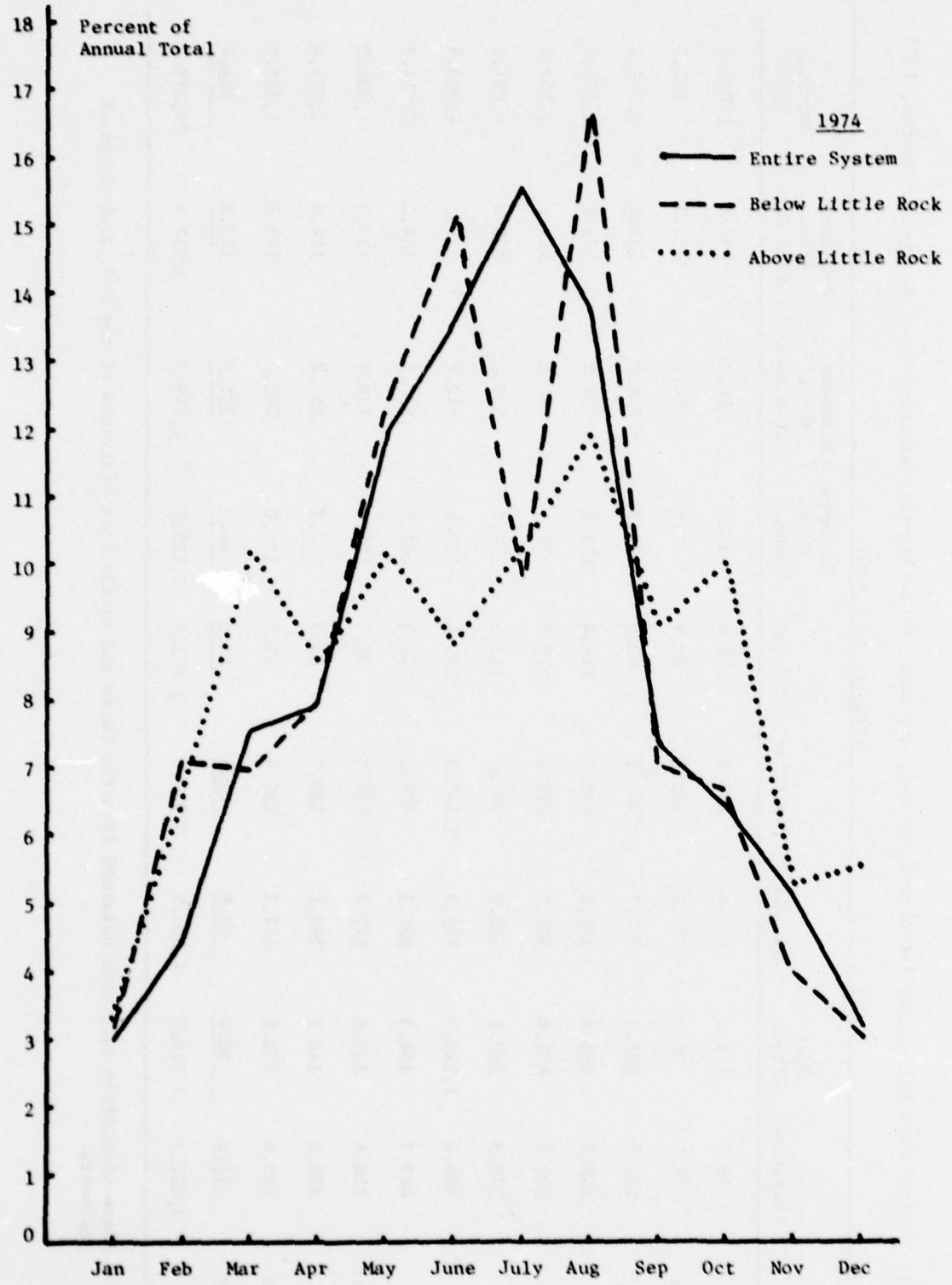


Figure 3: Monthly Percentage of 1974 Recreation Visitations for Area Above Little Rock, Area Below Little Rock in Arkansas, and for Entire Navigation System.

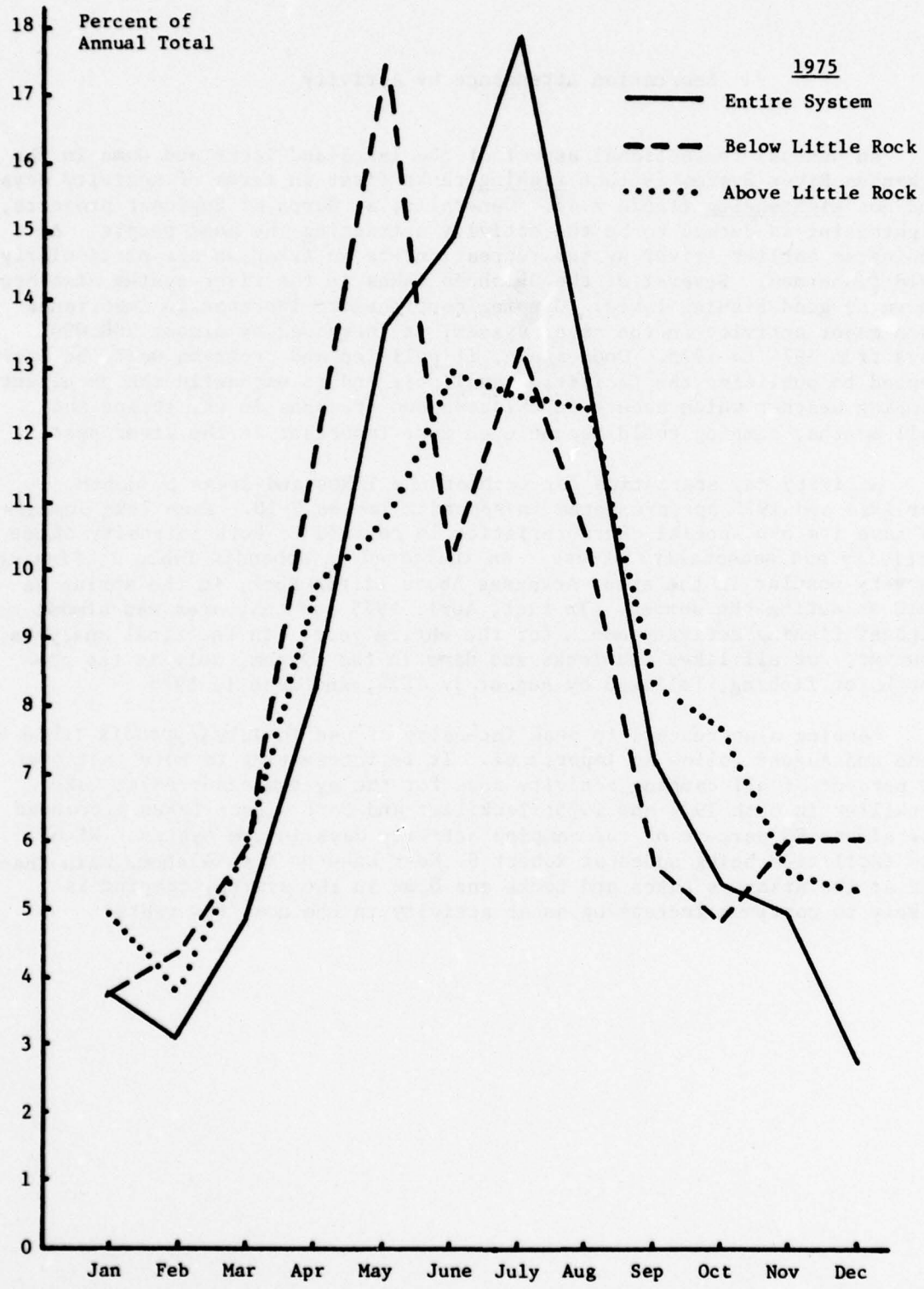


Figure 4: Monthly Percentages of 1975 Recreation Visitations for Area Above Little Rock, Area Below Little Rock, and for Entire Navigation System.

Recreation Attendance by Activity

An unusual recreational aspect of the lakes and locks and dams in the Arkansas River System is that fishing ranks first in terms of activity days, and not sightseeing (Table 2.4). Generally, at Corps of Engineer projects, sightseeing is deemed to be the activity attracting the most people. As indicated earlier, river system recreationists in Arkansas are particularly avid fishermen. Several of the Oklahoma lakes in the river system also are known as good fishing lakes. Camping continues to increase in importance as a major activity in the river system; it increased by almost 200,000 days from 1974 to 1975. Once again, if policies and programs would be implemented to publicize the facilities available and to emphasize the excellent camping weather which occurs in Oklahoma and Arkansas in the spring and fall months, camping could become even more important in the river system.

Activity day statistics for each of the lakes and areas by month for 1974 and 1975 are presented in Appendix Tables 2-10. Each lake appears to have its own special characteristics as related to both intensity of use by activity and seasonality of use. As indicated in Appendix Table 2, fishing is very popular in the area, Arkansas Above Little Rock, in the spring as well as during the summer. In fact, April 1975 for that area was almost the highest fishing activity month for the entire year. In the final analysis, however, for all likes and locks and dams in the system, July is the peak month for fishing, followed by August in 1974, and June in 1975

Camping also reaches to peak intensity of use in July (Appendix Table 4). June and August follow in importance. It is interesting to note that over 50 percent of all camping activity days for the system occurred at Lake Tenkiller in both 1974 and 1975; Tenkiller and Fort Gibson Lakes accounted for almost 80 percent of the camping activity days in the system. With new facilities being added at Robert S. Kerr Lake on the Oklahoma Main Channel and at the Arkansas Lakes and Locks and Dams in the system, camping is likely to continue increasing as an activity in the next few years.

Table 2.4: Recreation Attendance, by Activity, for all Lakes and Locks and Dams, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(1,000 Activity Days)

	1974	1975
Camping	3,455.6	3,641.2
Picnicking	2,808.7	3,536.9
Boating	2,169.6	2,113.7
Fishing	10,770.9	10,735.2
Hunting	249.7	153.0
Sightseeing	10,485.8	9,162.3
Skiing	571.0	610.6
Swimming	1,939.9	3,203.6
Other	1,660.7	1,858.6
Total	34,111.9	35,015.1

Source: Data obtained from Tulsa and Little Rock Districts, U.S. Army Corps of Engineers.

SOCIO-ECONOMIC CHARACTERISTICS AND PREFERENCES OF ON-SITE RECREATIONISTS

Introduction

The role of water-based outdoor recreation in fulfilling consumption desires of the general public is taking on new and expanded dimensions. Prerequisites to consumption are opportunity and purchasing power to engage in the recreation experience. These factors have been, and will continue to be, provided at increasing levels by economic, sociological and technological developments. Included in these developments are higher levels of income, more leisure time, better transportation systems, and changes in tastes and preferences for alternative leisure time activities.

> The implications of personal preferences for natural resource use are best illustrated by the demand for outdoor recreation facilities. Rates of use of outdoor recreation facilities have been increasing much more rapidly than would be indicated by increases in population and income, suggesting an increasing preference for outdoor activities [1, p. 145].

The rapid increase in reported visitations to recreation areas resulting from these developments suggest a need for expanded information systems related to water-based outdoor recreation. A recommendation made thirteen years ago by the Outdoor Recreation Resource Review Commission (ORRRC) is even more appropriate today. The Commission stated "A systematic and continuing program of research is needed to provide the basis for wise decisions and sound management" [2, p. 183]. Data collection, inventory, and factfinding, applied management research, and fundamental research were listed as continuing research needs by the commission.

The rapidly changing nature of water-based outdoor recreation may make the ORRRC recommendation even more relevant today. This changing nature includes not only increased demands, but also changing demands related to the recreation experience. Recreationists now have more and better equipment (e.g., campers, boats) which require different facilities than provided at our lakes in earlier years. More often than in the past, comforts of everyday life are brought along on the recreation trip. Many of these convenience items require electrical hook-ups; thus recreationists desire electricity at their campsites. As a result of this trend, more electric hook-ups will probably be found in recreational areas in the future. Other changing relationships could be noted and discussed (e.g., increasing numbers of sailboaters, level campsites for camping vehicles), but the point is obvious by now. A continued monitoring of data related to water-based outdoor recreation is needed to insure knowledgeable recreational supply and operational management decisions. Such is the goal of the present chapter.

Recreation Information from 1974 and 1975 Surveys

Origin of Recreation Group

As described in Chapter II (Procedures) the study area included 23 counties in Oklahoma and 40 counties in Arkansas. Recreation groups living in Oklahoma and Arkansas in the Study area defined above constituted 67 percent of the sample in 1974 and 73 percent of the sample in 1975 (Table 3.1). The remainder of the groups surveyed came from Oklahoma and Arkansas but outside the study region, and from other states.

Mode of Transportation

The recreationists traveled to the recreation areas by several modes of transportation. The predominant mode of travel was the automobile, representing over 40 percent of the groups (Table 3.2). The second most used vehicle was the pick-up truck with a camper attached; followed by pick-up trucks without campers. Some combination of a vehicle and a hard shell camp trailer ranked fourth, with the fifth most prevalent mode being motorized campers. These included converted buses and vans as well as the conventional motor homes. Other means of transportation included various types of vehicles pulling tent trailers, station wagons, and motorcycles.

Distance Traveled to Recreation Area

A percentage distribution of recreationists by distance traveled to reach a lake or lock and dam is presented in Table 3.3. Considering all recreation groups surveyed, 43 percent in 1974 and 52 percent in 1975 traveled 50 miles or less to reach the recreation area (Table 3.4). In both years almost 23 percent of the groups traveled 51-100 miles; over 13 percent in 1974 and nearly 11 percent in 1975 traveled 101-150 miles; the remaining recreationists traveled more than 150 miles to reach a recreation area. This distribution varies considerably between lakes. Keystone Lake, Oolagah Lake, and the Arkansas area below Little Rock are characterized by extremely high levels of localized use (i.e., 0-50 miles). This finding was validated to an even greater extent in 1975 as compared to 1974. Tenkiller Lake, on the other hand is characterized by more evenly distributed visits over several distance zones, and represents the lake drawing the people from the farthest distances. Eufaula Lake and the area, Arkansas above Little Rock, also draw visitors from more distant zones.

Much of the variation in miles traveled can be explained by the presence of a large urban area in those distance zones characterized by high vistiation rates. Keystone Lake, for example, includes Tulsa in the 0-50 miles zone; Eufaula Lake includes Oklahoma City in the 101-150 mile zone. The presence of a large urban area provides the population base from which a great deal of the demand for water-based outdoor recreation will come.

Table 3.1: On-Site Recreationists' Place of Residence, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975.

(Figures in Percent)

Place of Residence	1974	1975
Oklahoma and Arkansas Inside the Designated Region	67.49	73.44
Oklahoma and Arkansas Outside the Designated Region	23.89	17.49
All Other States	8.62	9.07
Total	100.00	100.00

Table 3.2: Mode of Travel to Recreational Area by Recreational Group, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975 [a]

(Figures in Percent)

Year	Car	Vehicle and Camp Trailer	Vehicle and Tent Trailer	Station-Wagon	Pick-up	Pick-up With Camper	Motorized Camper	Motor Cycle	Other
1974	44.50	[b]	2.08	4.86	17.54	28.64	7.23	0.50	2.28
1975	40.75	9.98	3.02	2.93	14.29	21.70	6.14	0.46	0.73

[a] Totals sum to more than 100 percent because some groups had more than one vehicle.

[b] Not specified in 1974.

Table 3.3: Distance Traveled by Recreation Groups to Reach Recreation Area, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975.

(Figures in Percent)[a/]

Miles	Keystone		Fort Gibson		Eufaula		Tenkiller		Oologah		Oklahoma Main Channel		Arkansas Above Little Rock		Arkansas Below Little Rock	
	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975
0 - 10	12.20	11.92	4.61	4.80	4.29	3.33	1.61	2.59	11.48	14.77	3.85	12.31	13.00	31.49	24.53	16.10
11 - 25	35.37	42.38	13.50	18.49	6.43	8.67	4.84	4.15	26.23	18.18	15.38	36.92	6.00	19.89	45.28	32.20
26 - 50	29.27	19.87	38.82	34.93	16.43	14.67	14.19	11.40	47.54	42.05	15.38	23.08	14.00	8.29	5.67	19.49
51 - 100	9.76	11.26	22.79	29.45	20.00	18.00	26.45	35.23	4.92	11.36	30.77	13.85	39.00	23.76	13.01	24.58
101 - 150	6.10	4.64	7.17	4.80	40.00	38.00	14.52	15.54	1.64	7.96	19.23	4.62	6.00	3.32	3.77	2.54
151 - 200	1.22	4.64	5.91	2.06	5.71	8.00	24.84	18.65	0.00	3.41	11.54	7.69	3.00	4.97	0.00	1.70
201 - 250	1.22	0.00	0.84	1.37	1.43	3.33	4.84	2.07	0.00	0.00	3.84	1.54	1.00	0.00	1.89	0.85
251 - 300	0.00	2.65	1.69	0.68	0.00	0.67	2.58	3.63	0.00	0.00	0.00	0.00	2.00	1.67	1.89	0.85
301 - 350	0.00	0.00	0.42	0.00	2.14	0.67	2.58	1.04	0.00	1.14	0.00	0.00	1.00	1.11	0.00	0.00
351 - 400	1.22	0.00	0.42	0.68	1.43	1.33	1.61	0.52	0.00	0.00	0.00	0.00	2.00	1.66	0.00	0.00
401 - 450	0.00	0.00	0.42	0.00	0.71	1.33	0.00	1.04	0.00	0.00	0.00	0.00	2.00	0.55	0.00	0.00
451 - 500	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.89	0.85
500 and over	3.66	2.65	3.38	2.74	1.43	2.00	1.29	4.15	6.56	1.14	0.00	0.00	11.00	3.32	1.89	0.85
Average[a/]	68	73	103	79	125	129	141	153	112	66	89	48	199	93	62	52

[a/] The average is indicated in miles traveled one-way to the recreation area.

Some of the variation in the miles traveled to a particular lake in 1974 and 1975 can be explained by the time of year interviewed. The study did not get underway until June 1974, and the interviews were taken in July, August, and early September (through Labor Day weekend), with one exception. To find out what types of recreationists used Lake Dardanelle in the off season, 25 interviews were taken in October 1974 at that lake. When these were averaged in with the other surveys, the travel distance increased significantly, since a high percentage of the groups interviewed in October were retired persons residing outside the region. This is the major reason for the 199 miles one way distance traveled for the area "Arkansas above Little Rock" in 1974, and the 11 percent who traveled over 500 miles.

In 1975, interviewers began in late May during Memorial Day week-end. Local fishermen thus made up a higher proportion of the total sample at Lake Dardanelle, which is a more realistic reflection of total use of the Lake than the off season camping use by long-distance travelers. Thus the 93 miles one way distance traveled to reach the area "Arkansas above Little Rock" in 1975 probably is a more accurate picture than is the 1974 figure.

No conclusion can be reached concerning effect of energy problems or the recession on travel distance by recreation groups. As indicated in Table 3.3, one way travel distance increased slightly for the two most intensively used lakes, Eufaula and Tenkiller, as well as for Keystone; travel distance declined for Fort Gibson and Oologah Lakes and the three areas on the Arkansas River and Verdigris River. For some areas, then, localized use may have increased slightly in 1975.

Travel in Local Area

In addition to miles traveled to reach the recreation site, recreationists also engage in some driving after reaching their destination. A distribution of average miles driven per day while on the recreation trip is presented in Table 3.4. This driving may involve going to the store for a bag of ice or finding a new fishing spot. In each survey year, approximately 80 percent of all recreation groups traveled less than 10 miles per day after reaching the recreation area of their choice. About 15 percent traveled between 11 and 25 miles per day. Once the recreation site is reached, there appears to be very little additional driving by the recreational groups.

Driving Time to Reach Recreational Area

The driving time from place of residence to the recreation area was calculated (Table 3.5). The distribution of driving time varies considerably among the lakes and locks and dams, and is closely correlated with distance traveled. Just as miles traveled was influenced by the location of the lake or lock and dam in relation to a large urban area, driving time varies by this same variable as well as by the types of highways serving the individual projects.

Table 3.4: Average Miles Driven Per Day by Recreationists in Local Recreational Area for Recreational Purposes, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in Percent)

Local Miles Driven	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock	Total Sample
1974									
0	39.02	51.06	26.43	22.58	52.46	30.76	51.00	67.93	38.36
1 - 10	43.90	31.22	54.29	50.96	40.98	53.84	34.00	24.53	42.62
11 - 25	9.76	13.50	15.00	21.29	6.56	3.85	11.00	7.54	14.57
26 - 50	4.88	3.38	3.57	3.87	0.00	3.85	3.00	0.00	3.27
51 - 100	2.44	0.00	0.71	0.65	0.00	3.85	1.00	0.00	0.68
100 or more	0.00	0.84	0.00	0.65	0.00	3.85	0.00	0.00	0.50
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1975									
0	47.67	43.16	23.33	15.03	34.09	66.15	56.35	50.00	39.65
1 - 10	33.78	39.04	49.34	59.06	43.18	23.08	29.83	35.59	40.74
11 - 25	11.26	13.01	17.33	20.21	15.91	9.23	4.97	11.02	13.10
26 - 50	5.96	4.11	9.33	4.66	4.54	1.54	6.08	2.54	5.22
51 - 100	1.33	0.68	0.67	1.04	1.14	0.00	1.66	0.85	1.01
100 or more	0.00	0.00	0.00	0.00	1.14	0.00	1.11	0.00	0.28
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 3.5: Driving Time Required to Reach the Recreation Area, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975.

(Figures in Percent)

Driving Time in Hours	Keystone		Fort Gibson		Eufaula		Tenkiller		Oologah		Oklahoma Main Channel		Arkansas Above Little Rock		Arkansas Below Little Rock	
	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975
0 - ¼	19.50	20.53	8.86	8.90	4.29	5.33	2.26	4.14	18.03	18.18	7.69	21.54	12.00	35.92	33.96	22.87
¼ - ½	31.71	37.75	8.02	18.49	10.71	9.33	6.45	3.63	36.06	18.18	11.53	29.22	10.00	14.36	37.74	22.88
½ - 3/4	19.51	9.27	8.86	11.64	4.29	4.00	3.87	2.59	16.40	20.46	11.53	18.46	3.00	5.52	1.89	2.63
3/4 - 1	6.10	7.95	38.40	26.04	12.14	8.00	9.68	9.84	14.75	21.58	11.53	4.62	10.00	6.63	3.77	13.56
1 - 2	10.98	7.95	16.88	24.66	21.44	23.33	25.49	33.17	4.92	10.23	23.08	12.31	35.00	18.79	15.09	24.57
2 - 3	3.66	5.96	5.06	2.74	35.71	32.68	16.45	18.65	1.64	5.68	15.40	9.23	8.00	5.52	0.00	3.39
3 - 4	2.44	3.97	5.06	2.74	3.57	6.00	21.29	14.51	1.64	3.41	11.54	3.08	2.00	4.42	1.89	1.70
4 - 5	1.22	0.66	2.53	0.68	2.14	3.33	5.16	3.63	0.00	0.00	7.70	1.54	1.00	0.00	0.00	1.70
5 - 8	0.00	3.31	2.11	1.37	3.57	6.67	6.45	4.66	0.00	1.14	0.00	0.00	4.00	4.97	1.89	0.85
8 or more	4.88	2.65	4.22	2.74	2.14	1.33	2.90	5.18	6.56	1.14	0.00	0.00	15.00	3.87	3.77	0.85
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Use of Other Recreational Areas on Same Trip

Recreationists' response to the question, "Have you visited other recreational areas away from this lake or lock and dam on this trip?". is presented in Table 3.6. The findings suggest that most recreationists visit water-based outdoor recreation facilities at a Corps lake or lock and dam for the purpose of using that facility alone, without any intention of visiting some other recreational area. Those few who do visit other areas are probably on extended vacations, or they are retired persons traveling from area to area during the entire recreation season.

Major Activity Participated in by Recreation Groups

Once the recreationists reached their desired recreation area, they would engage in one or several water and land related recreational activities. Each recreation group was classified by major recreation activity. Even though the groups normally participate in more than one activity, they were asked to identify the one activity they considered to be the most important (Tables 3.7 and 3.8). Camping and fishing are by far the most popular activities for all the recreation areas samples around the lakes and locks and dams. The other activities varied considerably between projects. The Arkansas recreation areas, for example, which are more river oriented than lake oriented, tended to have much less boating and water skiing than the Oklahoma recreation areas. The greatest camping participation occurred at the older established lakes such as Tenkiller and Fort Gibson.

Activities Participated in by Recreational Groups in 1975

It was concluded from the 1974 survey that the classification of recreationists into major recreational activities was much too confining. Recreationists do, in fact, engage in several activities when they visit a recreation area. Therefore, in 1975, additional information on all activities participated in was obtained. Fishing and camping are still the most frequent activities participated in, but the swimming activity shows up as a significant secondary activity where it was cited only a few times as a primary activity (Table 3.9). All activities increase in significance as a secondary activity. As a whole, the recreation groups visiting the lakes and locks and dams along the Arkansas River Navigation Systems are engaging in a bundle of complimentary activities.

Type of Overnight Accomodations

For those persons staying overnight at the public use areas, the most common type of overnight accomodation was a camper vehicle (Table 3.10). These camper vehicles would include any type camper which is set on wheels. The next most popular type of overnight accomodations at the recreation area was a tent.

Table 3.6: Recreationists' Responses to the Question: Have you visited other recreational areas away from this lake or lock and dam on this trip?, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975.

(Figures in Percent)

Lake or Lock and Dam	1974 Yes	1975 Yes
Keystone	5.00	6.76
Fort Gibson	1.27	4.93
Eufaula	1.46	7.38
Tenkiller	4.25	15.10
Oologah	1.67	4.55
Oklahoma Main Channel	0.00	6.25
Arkansas Above Little Rock	1.00	11.18
Arkansas Below Little Rock	0.00	4.27
Total Sample	2.40	8.34

Table 3.7: Major Recreational Activity of On-Site Recreationists by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974[a]

(Figures in Percent)

Activity	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock	Total Sample
Camping	24.39	38.72	37.14	31.94	36.06	46.15	42.00	22.64	33.80
Picnicking	8.54	5.11	2.14	3.55	8.20	0.00	3.00	3.77	4.42
Boating	17.07	14.04	10.72	17.10	19.67	11.54	5.00	5.66	13.11
Fishing	30.49	26.38	27.86	22.58	19.67	42.31	43.00	54.71	31.22
Sightseeing	6.10	9.85	0.71	0.65	1.64	0.00	1.00	5.66	2.11
Water Skiing	9.76	8.94	12.86	19.03	11.48	0.00	4.00	0.00	10.31
Swimming	2.44	5.96	7.86	4.84	3.28	0.00	1.00	7.56	4.51
Other	1.21	0.00	0.71	0.31	0.00	0.00	1.00	0.00	.52
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

[a]The interviews were taken in May, June, July and August which obviously affects the water sport activity.

Table 3.8: Major Recreational Activity of On-Site Recreationists by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1975[a].

(Figures in Percent)

Activity	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock	Total Sample
Camping	28.48	38.36	30.67	37.82	25.00	6.15	22.65	12.71	28.66
Picnicking	9.93	4.11	3.33	2.07	14.77	3.08	13.26	16.95	6.92
Boating	5.30	7.53	4.00	7.77	6.82	3.08	1.10	0.85	4.97
Fishing	27.15	27.40	28.67	24.87	31.82	69.23	50.28	56.78	35.57
Sightseeing	1.33	2.06	2.00	0.52	1.14	3.08	1.66	0.85	1.52
Water Skiing	7.28	4.80	16.00	11.92	9.09	1.54	3.87	1.70	8.20
Swimming	17.88	13.70	12.67	11.40	10.23	13.85	6.08	9.32	12.01
Other	2.65	2.06	2.67	3.63	1.14	0.00	1.10	0.85	2.15
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

[a]The interviews were taken in May, June, July and August which obviously affects the water sport activity.

Table 3.9: Activities Participated in by Recreationists, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1975

(Figures in Percent)

Activity	Keystone	Fort Gibson	Eufaula	Tenkiller	Oolagah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock	Total Sample
Camping	50.99	71.92	85.33	88.08	62.50	27.69	48.62	52.54	64.38
Picnicking	21.19	17.12	7.33	13.99	29.54	12.31	18.23	27.97	17.86
Boating	25.17	37.67	47.33	54.92	32.96	26.15	22.65	27.97	35.71
Fishing	48.34	57.53	59.33	67.87	60.23	78.46	69.61	70.34	63.19
Sightseeing	1.99	3.42	4.00	7.25	2.27	4.62	3.32	2.54	3.85
Water Skiing	19.21	15.07	34.67	34.72	14.77	9.23	6.63	6.78	19.14
Swimming	48.34	45.21	55.33	68.39	54.54	21.54	19.34	22.88	43.77
Other	4.63	6.16	8.00	10.36	1.14	0.00	1.66	2.54	5.04

Table 3.10: Type of Overnight Accommodations Used By Recreationists, By Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975.

(Figures in Percent)

	Keystone		Fort Gibson		Eufaula		Tenkiller				Oklahoma Main Channel		Arkansas Above Little Rock		Arkansas Below Little Rock		Total Sample	
	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975
Return Home Away From Area	46.34	59.60	23.62	34.25	12.86	21.33	19.36	20.21	55.73	50.00	30.77	81.54	8.00	53.04	50.94	53.39	27.24	40.45
Cabin At Area	0.00	0.00	0.42	0.00	2.14	2.67	1.61	2.07	0.00	1.14	0.00	0.00	0.00	0.00	0.00	0.00	.77	.96
Motel At Area	0.00	0.00	0.42	0.00	0.71	0.00	0.32	1.04	1.64	0.00	0.00	1.54	2.00	1.11	1.89	0.00	.72	.48
Camper Vehicle	29.27	29.14	52.74	52.06	50.71	53.33	52.58	50.26	19.67	38.64	65.39	10.77	61.00	26.52	28.30	26.27	46.23	40.33
Tent	9.76	10 60	15.19	11.64	22.14	21.33	22.58	22.80	21.31	7.96	3.85	4.62	23.00	12.16	16.98	18.64	17.82	15.45
Seasonal Home Area	0.00	0.00	0.42	0.00	2.86	1.33	0.32	0.52	0.00	0.00	0.00	0.00	0.00	0.55	0.00	0.00	.62	.42
Permanent Home Area	2.44	0.00	0.42	0.68	0.71	0.00	0.32	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	.92	.11
Stay with Friends in Area	3.66	0.66	2.53	0.68	1.43	0.00	0.00	0.00	0.00	1.14	0.00	1.54	2.00	3.87	0.00	0.85	1.47	.95
Sleep on Cots, other	8.53	0.00	3.80	0.68	6.43	0.00	2.90	1.55	1.63	1.14	0.00	0.00	2.00	2.21	1.89	0.85	4.21	.85
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

This section has outlined where the recreationists who use the recreation facilities along the waterway came from; it indicates how they got there; how long it took them; what they did; and where they stayed. The following section describes some personal characteristics of the sample of recreationists.

Socio-Economic Characteristics of Recreationists

Socio-economic characteristics of recreationists are assumed to have an influence on an individual's participation in outdoor recreation. Selected characteristics as they relate to participation in outdoor recreation along the McClellan-Kerr Navigation System are discussed in this report. Variables analyzed were: education level, occupation, household income, and number of week's vacation.

Any analysis of characteristics related to their impact on recreation participation rates must be tempered by a recognition of their interdependence. For example, individuals with higher levels of education are more likely to be professional or administrative workers; professionals or administrators are more likely to earn high incomes; and incomes are likely to increase with age. So, it is probably a combination of different characteristics that have the final impact on recreationists' decisions to engage in outdoor recreation.

Education Level

Analysis of the education level of respondents for the 1974 and 1975 surveys indicate relatively similar distributions of educational level obtained. Over 75 percent of the recreationists surveyed had a high school education or more in both 1974 and 1975 (Table 3.11). Based on the 1970 census data, of individuals 25 years of age or older, 52 percent in Oklahoma, and 39 percent in Arkansas has a high school education or more [3]. These findings suggest that persons with higher education levels are more likely to engage in water-based outdoor recreation than those persons with less education.

Occupation of Recreationists

The data collected for 1974 and 1975 reflect relatively similar distributions of occupations for recreationists using all the lakes and locks and dams (Table 3.12). The highest single participation level in 1974 was the labor-operative classification with 19.43 percent; in 1975 craftsmen ranked highest with 22.98 percent. Other categories showing high rates of participation are professional and manager or administrator. These classes are also higher income occupations.

It should be noted that the occupational classification was indicated on the survey for the person being interviewed during the 1974 interviews;

Table 3.11: Recreationists' Level of Education, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in Percent)

Educational Classification	1974[a/]	1975[b/]
0 - 6 years	2.97	4.85
7 - 11 years	18.04	19.51
High School	44.30	39.47
13 - 15 years	18.92	17.13
B.S.	8.13	11.17
M.S.	2.68	1.37
Ph.D.	1.39	1.19
Technical	2.97	4.03
Other	0.30	0.18
No Response	0.30	1.10
Total	100.00	100.00

[a/] 1974 education level refers to the respondent to the survey.

[b/] 1975 education level refers to the head of household of the group.

Table 3.12: Recreationists Occupation[a] By Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in Percent)

Occupational Classification	Keystone		Fort Gibson		Eufaula		Tenkiller		Oolagah		Oklahoma Main Channel		Arkansas Above Little Rock		Arkansas Below Little Rock			
	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975
Professional	12.20	10.60	9.28	12.33	9.29	6.00	16.45	15.03	19.67	11.36	7.69	3.08	6.00	8.84	7.55	4.24	11.28	9.78
Manager, Administrator	7.32	13.24	11.81	11.64	18.57	15.33	16.77	17.62	9.84	10.23	3.85	12.31	11.00	9.94	5.66	9.32	12.89	13.30
Sales, Clerical	12.20	11.26	8.86	6.16	7.14	6.67	13.23	11.92	11.48	6.82	7.69	12.31	9.00	6.63	11.32	9.32	10.40	8.83
Craftsman	15.85	19.20	11.39	21.23	9.29	31.33	8.39	17.10	6.56	25.00	7.69	26.15	8.00	22.65	16.93	26.27	10.78	23.03
Laborer, Operative	19.51	20.53	18.99	12.33	20.00	12.00	16.77	12.44	32.79	20.46	26.92	24.62	14.00	16.02	26.42	21.19	19.88	15.74
Service Worker	8.54	3.97	6.75	13.70	5.71	9.33	8.39	9.85	3.28	10.23	0.00	3.08	8.00	5.52	1.89	6.78	6.49	8.40
Farmer	0.00	0.00	0.84	0.00	1.43	2.67	1.29	0.00	3.28	1.14	3.85	1.54	1.00	1.10	7.55	7.63	1.72	1.36
Retired	6.10	11.26	18.56	16.44	14.29	12.00	8.71	10.88	1.64	10.23	34.62	10.77	30.00	21.55	0.00	9.32	13.34	13.30
Not Employed	0.00	2.65	0.84	2.06	2.14	1.33	0.65	0.52	1.64	2.27	0.00	1.54	1.00	2.76	9.43	3.39	1.57	1.85
Housewife	12.20	2.65	8.44	0.68	7.14	0.67	7.10	0.00	4.92	0.00	7.69	1.54	9.00	0.00	0.00	1.70	7.77	.78
Student	2.44	0.66	4.22	0.68	0.00	1.33	1.29	3.11	3.28	2.27	0.00	0.00	0.00	0.55	3.77	0.00	1.76	1.27
Other	3.66	3.97	0.00	2.74	2.86	1.33	0.97	1.55	1.63	0.00	0.00	3.08	2.00	4.42	0.00	0.85	1.65	2.36
No Response	0.00	0.00	0.00	0.00	2.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	.47	0.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.24	100.00

[a] See text for explanation of change in method of determining occupation between 1974 and 1975.

for 1975, the interviewers asked the respondent to state the occupation for the head of the household. This is the major reason "housewife" as an occupation changed from 8 percent to less than 1 percent, and "service worker" and "craftsman" increased between 1974 and 1975.

Annual Household Income

Household income is the one socio-economic variable that probably influences recreation participation most. A prerequisite to participation is the availability of purchasing power to engage in the recreation experience. Income level of course, is influenced by many other socio-economic variables. Approximately 52 percent of all respondents reported annual household incomes $12,000 or more in both 1974 and 1975 (Table 3.13). This figure can be compared with 1970 census data indicating annual income of $12,000 or over for only 9 percent for the state of Oklahoma [3]. The median household income level, across all respondents, was in the $12,000 to $14,999 income class. Oklahoma and Arkansas residents had 1974 median household income of $8,950 and $7,400 respectively. These findings are indicative of higher participation rates for water-based outdoor recreation by persons with higher incomes.

Annual Vacation Periods

The vacation for survey respondents in both 1974 and 1975 was typically two weeks (Table 3.14). The second most reported vacation period was three weeks. About 10 percent of all recreationists surveyed indicated that they had more than four weeks vacation. This classification would include many of the retired persons in the samples. Somewhere between 15 and 20 percent of the recreationists had no scheduled vacation at all. They simply used holidays, weekends or partial days (mornings or evenings usually) for their recreation enjoyment.

Visitation Characteristics for Recreationists

This section describes and analyzes survey visitation data of recreationists. The discussion includes number of persons in group; length of visit to recreation site; first year the recreation area was used by each group and average visitor days per month, per group.

Size of Recreation Group

The distribution of recreation groups by size of the group is similar for both 1974 and 1975 respondents. The most common size group is two persons; the next most common is four; the average size group is nearly four persons, with some variation between lakes (Table 3.15). The size of recreational group ranged from 3.2 persons per group in the area, "Arkansas Below Little Rock": to 4.6 persons per group at Lake Oologah in 1974. In 1975, the group size ranged from 3.0 persons in the area, "Oklahoma Main

Table 3.13: Recreationists' Annual Household Income, By Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in Percent)

Income Class (In Dollars)	Keystone		Fort Gibson		Eufaula		Tenkiller		Oologah		Oklahoma Main Channel		Arkansas Above Little Rock		Arkansas Below Little Rock		Weighted Total	
	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975
Under $3,000	2.44	3.31	2.53	2.74	4.29	1.33	2.26	5.18	4.92	1.14	3.85	3.08	3.00	5.52	3.77	5.93	3.09	3.62
3,000 - 4,999	7.32	4.64	2.95	7.53	5.71	4.00	1.61	1.55	1.64	6.82	3.85	6.15	5.00	9.39	7.55	5.93	4.48	5.31
5,000 - 6,999	9.76	7.28	7.60	5.48	5.71	5.33	5.48	6.74	4.92	3.41	15.38	9.23	8.00	11.05	13.21	7.63	7.97	7.01
7,000 - 8,999	10.98	6.62	11.39	8.90	7.14	10.67	7.42	5.18	21.31	7.96	7.69	6.15	13.00	10.50	26.42	16.95	11.43	3.73
9,000 - 11,999	9.76	23.84	19.41	15.75	25.00	14.00	17.74	12.95	19.67	17.04	23.08	23.08	16.00	14.36	20.76	12.72	18.18	16.01
12,000 - 14,999	20.73	21.19	21.94	18.49	17.86	24.67	24.19	18.14	13.12	25.00	26.92	16.92	21.00	20.44	13.21	14.41	20.54	20.03
15,000 - 19,999	13.42	14.57	16.46	16.44	17.14	15.33	20.00	23.83	18.03	19.32	15.39	16.92	21.00	17.68	3.77	17.80	16.36	18.00
20,000 - 29,999	17.07	7.95	9.28	14.38	12.14	16.00	13.55	19.69	11.48	10.23	3.85	9.23	7.00	3.87	5.66	6.78	11.34	12.43
30,000 and over	7.32	4.64	1.27	2.06	2.14	0.67	3.23	4.14	3.28	5.68	0.00	4.62	1.00	2.21	0.00	2.54	2.82	2.99
No Response	1.22	5.96	7.17	8.22	2.86	8.00	4.52	2.59	1.64	3.41	0.00	4.62	5.00	4.97	5.66	9.32	3.79	5.87
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 3.14: Number of Weeks Vacation Per Year of Recreationists, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in Percent)

Weeks Vacation	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock	Total Sample
0	15.85	21.94	18.57	16.45	14.75	42.31	32.00	22.64	20.42
1	12.20	6.33	11.43	8.71	9.84	7.69	23.00	5.66	7.83
2	36.59	27.43	40.72	35.16	39.34	15.39	17.00	33.97	32.71
3	17.07	19.41	12.86	19.68	16.39	19.23	17.00	24.53	18.24
4	10.98	16.03	9.29	8.39	11.48	7.69	3.00	9.43	11.60
5 or more[a]	7.31	8.86	7.13	11.61	8.20	7.69	8.00	3.77	9.20
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1975									
0	13.24	13.69	9.33	6.74	12.50	26.15	25.97	22.03	15.38
1	9.93	10.96	12.67	11.40	7.96	12.31	11.60	25.42	12.64
2	41.72	36.30	38.67	35.75	36.36	35.38	27.62	33.06	35.44
3	15.23	18.49	15.33	18.65	18.18	10.77	12.71	9.32	15.20
4	9.34	8.22	8.00	16.58	14.77	3.08	14.92	6.78	11.08
5 or more a/	10.54	12.34	16.00	10.88	10.23	12.31	7.18	3.39	10.26
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

[a] Many of the longer vacations reported in this category are by retired persons.

Table 3.15:Number of Persons in the Recreation Group, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in Percent)

Group Size	Keystone		Fort Gibson		Eufaula		Tenkiller		Oologah		Oklahoma Main Channel		Arkansas Above Little Rock		Arkansas Below Little Rock		Weighted Total	
	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975
1	10.98	7.29	1.27	2.74	2.86	0.67	1.61	1.55	3.28	4.54	7.69	13.85	0.00	16.02	15.09	7.63	4.71	5.72
2	32.93	33.78	36.29	34.25	27.14	22.67	24.52	30.05	19.67	21.59	38.46	36.92	53.00	28.18	30.19	22.03	32.36	29.07
3	13.42	17.22	14.77	15.75	15.71	15.33	17.74	11.40	13.12	23.86	7.69	16.92	11.00	12.71	18.87	12.71	14.77	14.82
4	13.42	17.22	23.63	16.44	28.57	23.33	22.26	23.83	27.87	17.04	26.92	16.92	15.00	17.13	22.64	18.64	21.64	19.62
5	19.51	6.62	9.28	13.01	13.57	10.67	13.55	17.62	18.03	7.96	11.54	6.15	8.00	9.39	7.55	8.48	13.01	11.38
6	3.66	9.27	8.02	8.22	5.00	9.33	6.45	6.74	8.20	10.23	3.85	1.54	5.00	7.74	1.89	10.17	5.35	7.94
7	1.22	4.64	3.80	2.06	2.14	4.67	4.84	4.66	0.00	4.54	3.85	1.54	5.00	3.32	0.00	5.93	2.94	3.92
8	1.22	2.65	0.00	2.74	2.14	2.00	2.58	1.04	0.00	1.14	0.00	1.54	2.00	1.66	0.00	3.39	1.37	1.97
9	1.22	0.66	2.11	0.68	2.14	2.00	1.29	0.52	1.64	5.68	0.00	1.54	0.00	0.00	0.00	3.39	1.23	1.31
10-12	1.22	0.66	0.00	3.42	0.71	5.33	2.58	2.07	4.90	1.14	0.00	1.54	0.00	2.76	3.77	5.93	1.44	2.99
13 or more	1.22	0.00	0.84	0.68	0.00	4.00	2.58	0.52	3.28	1.14	0.00	0.00	1.00	1.11	0.00	1.69	1.18	1.26
Average[a/]	3.49	3.50	3.64	3.88	3.76	4.84	4.37	3.94	4.59	4.10	3.23	3.00	3.36	3.58	3.17	4.55		

[a/] Average number of individuals in the group.

Channel", to 4.8 persons at Lake Eufaula. This variable is an important one to recreation area administrators, because it is one component part of the visitor day concept which is used to measure recreation attendance or use.

The average length of stay per trip for all lakes and locks and dams in the System for a recreation group was 4.43 days in 1974 and 3.59 days in 1975 (Table 3.16). In the sample, there were more "one day or less" users and fewer "two nights or more" users in 1975 than in 1974. Again, the interviews taken in October 1974 tend to distant somewhat the average days length of stay for the area, "Arkansas Above Little Rock". Recreationists interviewed at Lake Dardanelle planned to stay almost a week before moving on. This tended to increase the average for that area. The 1975 average of 2.58 days is probably more realistic for that area.

Lakes Eufaula and Tenkiller are generally characterized by longer travel distances for recreationists; these two lakes are also characterized by longer average length of visit. Recreationists travel a shorter distance to reach some of the other recreation areas. Thus, they are likely to make frequent trips to the lake and/or are not as likely to feel the need for a long visit as those recreationists who invest considerable travel time to reach the lake. Eufaula and Tenkiller lakes are traditionally used as "vacation lakes," which also accounts for the longer average length of stay.

Importance of Repeat Visits to Recreational Areas

Each recreation group was asked to indicate the year when they had first used the lake or lock and dam they were visiting when interviewed. The data suggest that there is a high propensity for recreationists to make repeat visitations to the various lakes (Tables 3.17 and 3.18). This indication of repeated visitations by the same "hard-core" users at any particular lake could imply a lack of information about alternatives, or simply a revealed preference for a single desirable recreation environment.

The 1975 survey was slightly different with respect to repeat visitation by persons who had used the recreation area before. In 1974, at least 75 percent of the groups had visited the recreation area before the current year. Somewhere between 7 and 25 percent were visiting for the first time. This would seem to indicate, to the extent that these people also become repeat visitors, that the use of the outdoor recreation facilities at any given lake or lock and dam will increase in the future.

The date in Table 3.17 and 3.18 need to be correlated with Table 2.1, which indicates when the lake and/or locks and dams in the designated areas were first open to the public. For example, 1964 was the first year of use for the recreational facilities at Lake Keystone. It is interesting to note that 25 percent of the recreationists interviewed in 1974 and 16.6 percent in 1975 indicated they had used the facilities in the area, "Arkansas Above Little Rock" before 1965. In reality, Lake Dardanelle was the first lake opened in that area, and 1965 was its first year of use. Thus, it seems clear that many of the "old-time" users had fished and/or other recreated along the Arkansas River before it was dammed.

Table 3.16: Length of Stay at Recreation Area by Recreation Group, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in Percent)[a/]

Trip Classification	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock
1974								
One day or less	40.24	15.61	7.85	11.64	40.98	15.38	7.00	45.29
Overnight	7.32	20.25	11.43	10.97	24.59	11.54	8.00	13.21
Two Nights or More	52.44	64.14	80.72	78.39	34.43	73.08	85.00	41.50
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Average Days[a/]	3.67	4.54	5.31	5.85	3.51	3.62	3.92	2.15
1975								
One day or less	48.34	27.40	11.33	8.81	37.51	67.69	49.17	45.76
Overnight	11.26	13.01	22.00	11.91	17.04	9.23	12.71	16.95
Two Nights or More	40.40	59.59	66.67	79.28	45.45	23.08	38.12	37.29
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Average Days[a/]	3.28	3.84	4.69	4.87	2.85	1.77	2.58	2.41

[a/] Average Days for 1974 and 1975 is Average Days per trip

Table 3.17: Respondents Indication of First Year Facilities at That Lake or Area Were Used, McClellan-Kerr Arkansas River Navigation System, 1974

(Figures in Percent)

Year	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock
1974	6.10	4.64	2.86	4.52	9.84	11.54	9.00	9.43
1973	6.10	4.64	2.86	5.48	11.48	11.54	15.00	22.65
1972	2.44	3.79	8.58	3.55	0.00	3.85	15.00	22.64
1971	8.54	5.91	7.86	5.48	6.56	7.69	13.00	16.98
1970	6.10	3.80	7.86	3.23	3.28	3.85	6.00	9.43
1969	8.54	5.06	7.14	5.48	1.64	0.00	4.00	3.77
1968	2.44	2.11	10.71	2.26	11.48	0.00	1.00	0.00
1967	2.44	2.96	5.71	1.94	3.28	3.85	2.00	0.00
1966	17.07	4.79	8.57	4.52	6.56	0.00	0.00	0.00
1965	23.16	44.15	17.85	38.71	19.66	38.45	7.00	7.55
Before 1965	14.63	11.82	12.14	18.38	24.58	15.38	25.00	1.89
No Response	2.44	6.33	7.86	6.45	1.64	3.85	3.00	5.66
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 3.18: Respondents Indication of First Year Facilities at That Lake or Area Were Used, McClellan-Kerr Arkansas River Navigation System, 1975

(Figures in Percent)

Year	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock
1975	11.26	6.85	18.00	20.72	22.73	16.92	24.31	21.18
1974	7.28	9.60	2.67	4.66	6.82	13.85	6.08	12.71
1973	7.28	2.74	2.67	3.63	4.54	4.62	5.52	9.32
1972	5.96	6.16	4.00	5.18	10.23	20.00	6.63	11.86
1971	5.30	2.06	7.33	6.74	7.96	26.14	5.52	11.02
1970	8.61	4.80	9.33	3.63	3.41	3.08	9.95	11.86
1969	5.96	2.74	4.00	4.66	4.54	1.54	7.18	5.93
1968	6.62	0.68	6.00	0.52	2.27	1.54	2.76	0.85
1967	5.30	1.37	8.00	1.55	2.27	0.00	3.31	1.70
1966	1.99	2.06	4.00	0.52	1.14	1.54	9.94	1.70
1965	6.62	4.11	3.33	4.66	3.41	0.00	2.21	0.85
Before 1965	27.16	56.83	30.00	43.53	30.68	10.77	16.59	10.17
No Response	0.66	0.00	0.67	0.00	0.00	0.00	0.00	0.85
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Monthly Trends in Recreational Use

The most active months for recreationists in Oklahoma are June and July (Tables 3.19 and 3.20). The average Oklahoma group engages in more visitor days of water-based outdoor recreation in those months, on average, than any other. May and August are the other months of high intensive use of water based recreation facilities in Oklahoma. Actually, the participation pattern seems to decrease symetrically about those most active months of June and July.

Arkansas recreationists, on the other hand, seem to spread their visits more evenly over the months April through September. This is probably because that portion of the water-way has not yet developed a following of vacationing recreationists and are water-skiing type enthusiasts. The river orientation, as opposed to the larger lake environments in Oklahoma, is probably the main reason for fewer vacationers. Fishing is the key activity on the Arkansas Lakes and Locks and Dams, and the best fishing tends to be in the cooler spring and fall months.

Energy and Economic Conditions

What are the impacts of gasoline shortages and generally poor economic conditions on recreation participation decisions? These problems have become increasingly important in recent years to persons concerned with recreation facility use. One question in 1974 and three questions in 1975 were asked to get an indication of recreationists' behavior as it relates to these problems.

The 1974 question simply asked, "Have your travel plans to this area or to other recreational areas been affected by possible gasoline shortages?" The results of this question are tabulated in Table 3.21. Approximately 15 percent of respondents indicated that their travel plans had been adversely affected by the gasoline shortage. Obviously, some of those whose plans had been adversely affected likely stayed home more in 1974; thus were not at the lake to be interviewed.

The 1975 survey attempted to gain more information on the impact of the gasoline shortage and also on the impact of general economic conditions. The first question asked, "How has the price of gasoline (or shortage) affected your recreation related travel plans?" The respondent was asked to compare 1975 to 1974 and indicate "more", "same", or "less". The results are presented in Table 3.22. About 29 percent took fewer trips in 1975. Only 6.5 percent stay fewer days per trip, while 29 percent reported driving fewer miles to recreate.

The 1975 respondents were also asked to indicate the single most important factor related to the fuel problem that limits their recreation activities. Fifty-six percent indicated there was no limitation to their recreation activities related to the fuel shortage. Of those remaining, the dominant factor was simply price, as indicated by 40 percent of

Table 3.19: Average Visitor Days per Month, per Group[a/], by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974.

	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock
January	2.63	1.53	2.92	0.92	3.74	1.90	1.22	0.46
February	2.69	1.88	3.56	1.22	2.99	1.90	1.56	0.55
March	5.61	3.21	5.37	2.21	4.66	5.52	2.89	3.08
April	11.77	6.63	7.31	3.98	5.34	8.65	5.60	5.83
May	14.76	11.32	11.81	9.89	7.11	10.25	8.52	10.03
June	17.79	15.19	16.76	14.23	15.49	9.25	10.04	9.98
July	20.21	18.73	25.60	24.99	23.52	13.02	8.87	7.90
August	16.07	17.04	17.18	19.70	15.54	12.25	14.68	10.65
September	11.68	8.13	9.14	6.72	7.75	9.03	8.40	7.77
October	7.11	4.16	6.60	4.34	5.15	8.08	6.36	2.75
November	3.89	1.78	4.69	1.42	4.52	3.65	2.06	1.93
December	2.82	1.34	3.78	0.95	3.44	2.67	1.20	0.35
Total	117.03	90.94	114.72	90.57	99.25	86.17	71.40	61.28

[a/] This is the total days for each month for the group. To convert back to an individual visitor day per month basis, the average size of recreation group would be used as the divisor.

[b/] For 1974, the monthly averages are for the sample only, and cannot be extrapolated to the population. See page for explanation.

Table 3.20: Average Visitor Days per Month, per Group[a], by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1975.

	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock
January	0.56	0.66	0.60	0.74	0.56	0.69	0.95	0.97
February	0.85	1.00	0.61	0.75	0.39	0.73	1.30	1.15
March	2.40	1.83	2.81	1.69	1.23	1.60	3.47	2.93
April	5.59	4.56	4.76	2.88	2.98	4.58	5.53	6.01
May	12.29	13.03	12.92	8.68	8.53	8.15	10.52	11.98
June	15.08	17.42	22.28	17.12	11.84	10.78	12.47	16.94
July	17.81	17.98	25.16	14.31	8.58	8.99	13.13	14.88
August	14.51	16.55	17.34	10.49	10.77	7.93	10.21	11.25
September	7.77	7.05	7.52	5.59	6.06	6.51	6.34	5.64
October	3.76	2.63	2.55	2.38	2.81	3.12	3.25	2.18
November	1.25	1.24	1.67	1.07	1.17	1.49	1.44	0.92
December	0.72	0.95	0.92	0.80	0.58	0.58	0.94	0.81
Total	82.59	84.90	99.14	66.50	55.50	55.15	69.55	75.66

[a] This is the total days for each month for the group. To convert back to an individual visitor day per month basis, the average size of recreation group would be used as the divisor.

Table 3.21: Response by On-Site Recreationists to The Question: "Were Your Travel Plans Affected by Possible Gasoline Shortages?", by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974.

(Figures in Percent)

Response	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock	Total Sample
Yes	15.85	18.64	15.00	12.26	16.39	16.00	12.00	5.66	14.50
No	84.15	81.36	85.00	87.74	83.61	84.00	88.00	94.34	85.50
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 3.22: On-Site Recreationists Comments on Effects of Gasoline Shortage on Recreation Participation, McClellan-Kerr Arkansas River Navigation System, 1975[a/]

(Figures in Percent)

	Number of Trips	Length of Stay	Distance Traveled Per Trip
More	1.8	3.2	1.3
Same	69.2	90.3	69.6
Less	29.0	6.5	29.1
Total	100.0	100.0	100.0

[a/] Compared to 1974

respondents. About 4 percent indicated Sunday closings of service stations or gave other reasons.

A final question asked, "How have general economic conditions (inflation and unemployment problems) affected your recreation activities?" Again, the respondents were asked to compare 1975 to 1974. The results are summarized in Table 3.23. The pattern of responses was nearly identical to the pattern of Table 3.22 which was related to the gas shortage. Nearly 25 percent of the recreation groups took fewer trips in 1975 as compared to 1974 and slightly more than 22 percent traveled fewer miles to reach the recreation area due to current economic conditions.

This information obtained from recreationists in 1974 and 1975 does indicate that the fuel problems and general economic conditions have had some effect on recreation participation. It also helps explain the previous findings that localized use of public recreation areas is on the increase in 1975. However, due to an increasing number of Americans recreating (because of higher incomes and higher population), the total visitations still increased in 1975 over 1974 by 1.5 million. The indication is then that visitations would have increased even more rapidly had it not been for high rates of inflation and higher gasoline prices. Another hypothesis may be that recreationists tend to think they took fewer trips (or at least told the interviewers that), but in reality continued to recreate in 1975 at about the same rate as in previous years.

Admission and User Fees

Several questions relating to payment of fees for use of, or admission to, recreation facilities are discussed below. It should be noted, that the data in Tables 3.24, 3.25 and 3.26 pertain to overnight campers only since they would be the only recreation groups subject to paying a user's fee. The data presented in Table 3.27 represents all recreation groups since the question asked related to a payment or fee for admission to the recreation area, and would pertain to all recreationists.

For those recreation groups using a non-fee camping area, the following question was asked: "Would you be willing to pay a nominal user fee ($2.00 to $3.00 per night) for this campsite if this fee would be used for operation and maintenance of the facilities?" Of all recreation groups currently using a non-fee area, 63 percent indicated in 1974 that they would be willing to pay a nominal user fee (Table 3.24). However, the corresponding figure in 1975 was only about 43 percent. Perhaps the fuel problems and the worsening economic conditions had an influence on recreationists' willingness to pay.

A similar question was asked of campers in fee areas. It asked: "Do you object to paying the fee for the camping site you are occupying?" The results are tabulated in Table 3.25. For the total sample of fee paying campers, 65 percent in 1974 and 74 percent in 1975 did not object to paying the camping fee. The findings for fee area users are in contrast to those for non-fee campers. It is interesting to note that the percentage

Table 3.23: Response of On-Site Recreationists on the Effect of General Economic Conditions on Recreation Participation, McClellan-Kerr Arkansas River Navigation System, 1975[a/]

(Figures in Percent)

	Number of Trips	Length of Stay	Distance Traveled Per Trip
More	1.2	1.6	0.4
Same	74.6	87.5	77.2
Less	24.2	10.9	22.4
Total	100.0	100.0	100.0

[a/] Compared to 1974

Table 3.24: On-Site Recreationists Response to Question Asked of Campers in Non-Fee Areas: "Would You Be Willing to Pay a Nominal User Fee if This Fee Would be Used for Maintenance and Improvement of the Facilities?", by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in Percent)

Response	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel[a]	Arkansas Above Little Rock	Arkansas Below Little Rock	Total Sample
1974									
Yes	69.70	35.71	61.11	57.32	75.00	43.75	86.96	65.63	63.00
No	30.30	64.29	38.89	42.68	25.00	56.25	13.04	34.37	37.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1975									
Yes	35.14	27.78	44.44	45.76	36.00	100.00	27.27	63.64	42.86
No	64.86	72.22	55.56	54.24	64.00	00.00	72.73	36.36	57.14
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

[a] Only four (4) observations in 1975.

Table 3.25: On-Site Recreationists Response to Question Asked of Campers in Fee Areas: "Do You Object to Paying the Fee for the Camping Site You are Occupying?", by Lakes and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in Percent)

Response	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock	Total Sample
1974									
Yes	27.27	30.11	55.56	32.46	33.33	37.50	32.88	66.67	35.00
No	72.73	69.89	44.44	67.54	66.67	62.50	67.12	33.33	65.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1975									
Yes	18.42	32.94	34.69	16.17	43.48	50.00	20.55	12.90	26.00
No	81.58	67.06	65.31	83.83	56.52	50.00	79.45	87.10	74.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 3.26: On-Site Recreationists Response to the Camping Fee, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1975

(Figures in Percent)

Response	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock	Total Sample
Too High	36.84	38.42	59.18	35.00	54.17	66.67	29.17	9.68	39.87
About Right	63.16	58.82	39.80	65.00	45.83	33.33	65.28	90.32	58.59
Too Low	00.00	2.76	1.02	00.00	00.00	00.00	5.55	00.00	1.54
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 3.27: On-Site Recreationists Response to Question Asked: "How Do You Feel About Paying a Nominal Admission Fee For Use of the Recreation Area?", By Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1975

(Figures in Percent)

Response	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock	Total Sample
Willing to Pay	58.67	54.80	63.33	62.18	44.32	48.43	56.98	60.17	57.54
Object to Paying	41.33	45.20	36.67	37.82	55.68	51.57	43.02	39.83	42.46
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

not objecting to the user fee increased significantly between 1974 and 1975 for Keystone, Eufaula, and Tenkiller Lakes and for the three areas; the percentage not objecting declined in 1975 for Fort Gibson and Oologah Lakes. A single overall conclusion with respect to recreationists' feelings about user fees cannot be made from this data. Further and more detailed research of this matter is needed.

Two additional questions related to admission and/or user fees were asked in 1975. One question asked of the campers was whether the fee was "too high," "about right," or "too low". Most groups (58.6 percent) thought that the fees they were charged were about right. Nearly 40 percent thought they were too high. Less than two percent thought they were too low (Table 3.26).

Another question asked of all recreationists in 1975 was: "What is your thinking on paying a nominal fee (about $1.00 per car per day or an annual permit of $10.00 per year) for Admission to the recreational areas around our lakes? It is assumed that any monies collected would be used to operate and maintain these recreational areas, including restroom cleanup and disposal of trash and garbage. (This fee would not pay for the use of a campsite)."

In response to this question, nearly 58 percent of all respondents indicated they would be willing to pay such an admission fee (Table 3.27). This finding varies somewhat at different projects, but six of the eight recreation areas designated in this study suggest that based on majority rule, such an admission fee could be adopted. However, it would be far from unanimous consent. It is interesting to note that some of those recreationists who objected to paying user fee for camping (a question asked only of campers) would not object to paying an admission fee to enter the area. The authors do not know how to rationalize this seeming inconsistency.

Site Preferences and Opinions

Recreationists were asked several questions relating to the recreational facilities at the lake or lock and dam which they were using. The results of these questions are presented in this section. Note that the percentages shown in the tables to follow may sum to more than 100 percent, since many respondents listed more than one response.

The following question was asked of all respondents, "Why did you select this lake for your recreation visit?" The results of this question are presented in Table 3.28.

The high response rate in the first two categories, "close to home" and "visited before" suggest a high propensity of recreationists to make repeat visitations to the various lakes and locks and dams. This may be indicative of a lack of information on alternative areas, or simply a revealed preference for a single desirable recreation area. Another high response rate was obtained for the category labeled "attractive area".

Table 3.28: Recreationists Reasons for Selecting A Particular Recreation Area, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in Percent)[a]

Reason	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock	Total Sample
1974									
Close to Home	65.85	32.07	20.00	17.42	67.21	67.21	34.62	29.00	54.72
Visited Before	45.12	52.32	45.00	50.32	26.23	26.23	61.54	51.00	62.26
Recommended by a Friend	7.32	14.77	8.57	23.23	14.75	14.75	23.08	20.00	7.55
Attractive Area	28.05	31.22	32.14	45.16	19.67	19.67	7.69	30.00	41.51
Specified Facilities[b]	59.76	13.49	12.86	45.48	21.31	21.31	19.23	12.00	37.74
Other[c]	37.81	30.80	53.57	30.65	44.26	44.26	23.08	13.00	28.30
1975									
Close to Home	76.82	63.01	29.33	23.83	70.46	70.46	55.38	50.83	51.70
Visited Before	36.42	59.60	32.67	46.11	44.32	44.32	40.00	37.02	32.20
Recommended by a Friend	4.64	9.59	10.67	15.54	7.96	7.96	13.85	10.50	8.48
Attractive Area	17.88	47.95	37.33	59.07	29.55	29.55	27.69	27.62	34.75
Specified Facilities[b]	23.85	32.19	4.67	29.53	14.77	14.77	21.54	13.81	17.80
Other[c]	22.52	32.19	44.00	37.31	32.96	32.96	47.69	40.33	32.20

[a] Since many resondents listed more than one reason the percentages sum to more than 100 percent.

[b] Specified facilities include electric outlets, flush toilets, boat dock or marina, trailer dump station, nearby attraction, and ranger patrolled area.

[c] Other reasons include clear water, shade, swim area, good fishing, and many other reasons given only one time.

This suggests that recreationists are not only interested in a facility which will enable them to engage in specific water-based activities, but also visit the areas for their scenic beauty and/or esthetic value.

A final category of interest reveals just how important various "specified facilities" such as electric outlets, flush toilets, and boat docks are to the recreationists' decision to choose a particular recreation site. Although there is much variation between lakes (and years) with respect to this item, in general, these facility related items did not weigh too heavily in the recreationists' decision to visit a recreation area. Of course, this may be simply because recreationists have come to expect similar and adequate facilities at all public use areas.

An indication of the extent of the communication network which supplies information on various lakes and locks and dams is presented in Tables 3.29 and 3.30. The evidence is clear. The single most prevalent means of learning about particular recreation area is from a friend or relative. Word-of-mouth advertising accounts for most of the information generated on the recreation facilities. The second largest category was made up of people who lived in the vicintiy of the lake or lock and dam and "just knew" about it. These people have been termed locals, with respect to how they first learned about the facility.

Types of facilities actually used by recreationists are presented in Table 3.31. Thirteen different specifically identified recreation related facilities were used to some degree by recreationists. Among the most common used facilities were trash barrels, picnic tables, drinking water, and campsites. Relatively less use was made of picnic shelters, nature trails, and playgrounds. These items, however, are also in much shorter supply.

Each recreation group was asked what improvements they would like to see made to the recreation site which they were using. The results of this question are presented in Table 3.32. The question was asked in terms of--would you like to have "more or better" camping sites?--"more or better" swimming areas, etc. Over all respondents in 1974, approximately 15 percent indicated that they were satisfied with the area and did not indicate any improvements. This response increased in 1975 to slightly more than 27 percent. More interviews were taken in Arkansas in 1975, and many new facilities were completed and available to recreationists in the river system in Arkansas in 1975. This may account for part of the increased response of the suggested "improvements".

One frequent suggestion related to installation of flush type toilets. The desire for the improvement is undoubtedly related to the odor and unsanitary conditions associated with the old pit type toilets. Most of the new facilities (and replacement facilities) are of the flush type, and continued improvement in this area is expected.

Another highly desirable improvement was electric outlets. Showers were also cited relatively often. These findings reflect the growing notion that outdoor recreation is no longer a return to the wilderness experience. It appears that people want to maintain some degree of

Table 3.29: How On-Site Recreationists First Learned About Recreation Facilities at Camps, Lakes and Area, McClellan-Kerr Arkansas River Navigation System, 1974

(Figures in Percent)

	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock
T.V. or Radio	2.44	0.00	1.43	0.64	1.64	0.00	0.00	0.00
Newspaper	2.44	0.42	1.43	0.32	1.64	0.00	0.00	1.89
Travel Magazine	2.44	0.42	0.71	0.64	1.64	0.00	0.00	1.89
Travel Association Directory	1.22	0.42	0.71	0.00	0.00	0.00	0.00	0.00
Road Map	6.11	5.48	2.14	3.55	0.00	0.00	8.00	5.66
Boat and Travel Show	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00
Relative or Friend	36.59	56.54	55.71	64.84	42.63	53.85	77.00	52.83
Local[1]	35.37	24.47	27.86	9.35	49.18	26.92	12.00	33.96
Other	18.29	13.08	10.00	20.64	9.83	19.23	5.00	5.66

[1]This response was made by persons who lived in the very near vicinity of the recreation area. A typical response was, "We live around here and just knew about the lake." These persons we have termed "local".

Table 3.30: How On-Site Recreationists First Learned About Recreation Facilities at Camps, Lakes, and Area, McClellan-Kerr Arkansas River Navigation System, 1975

(Figures in Percent)

	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock
T.V. or Radio	3.31	0.00	2.00	0.00	1.14	1.54	0.55	0.85
Newspaper	1.99	0.00	3.33	1.04	2.27	1.54	0.00	0.00
Travel Magazine	0.00	0.00	0.67	0.00	0.00	0.00	0.55	0.00
Travel Association Directory	1.33	0.68	0.00	0.00	0.00	0.00	0.00	0.00
Road Map	1.99	4.11	4.00	7.25	7.96	7.69	4.97	0.85
Boat and Travel Show	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Relative or Friend	27.81	50.00	50.67	65.80	40.91	43.08	43.09	58.47
Local[1]	12.58	10.96	17.33	13.99	7.96	7.69	8.29	5.08
Other	55.63	41.78	25.33	15.54	43.18	41.54	46.96	38.98

[1]This response was made by persons who lived in the very near vicinity of the recreation area. A typical response was, "We live around here and just knew about the lake." These persons we have termed "local".

Table 3.31: Facilities Used by Recreationists, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in Percent)

	Keystone Lake		Fort Gibson Lake		Eufaula Lake		Tenkiller Lake		Oologah Lake		Oklahoma Main Channel		Arkansas Above Little Rock		Arkansas Below Little Rock		Total Sample	
	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975
Picnic Table	63.42	58.94	88.19	74.66	88.57	88.00	89.03	84.46	77.05	73.86	92.31	35.38	94.00	65.75	62.26	66.95	85.13	71.34
Grill	25.61	30.46	38.82	41.78	50.71	52.00	43.55	50.78	45.90	37.50	46.15	16.92	56.00	28.73	16.98	27.12	42.02	37.64
Picnic Shelter	2.44	3.31	5.06	2.74	1.43	0.00	3.87	4.14	4.92	3.41	0.00	3.08	17.00	6.08	15.09	7.63	5.55	3.85
Trash Barrel	78.05	64.24	90.72	78.08	92.14	80.67	94.19	89.64	85.25	81.82	92.31	36.92	95.00	60.77	66.04	72.88	89.79	72.98
Toilet	65.85	66.89	75.11	80.14	90.00	85.33	85.16	82.38	73.77	69.32	80.77	50.77	78.00	60.77	54.72	75.42	78.79	73.08
Shower	20.73	29.80	24.90	30.82	54.29	57.33	29.36	38.34	14.75	9.09	0.00	0.00	3.00	4.42	0.00	5.93	25.27	25.00
Campsite	56.10	45.03	72.15	66.44	85.00	79.33	82.90	80.31	52.46	42.04	69.23	20.00	93.00	40.88	52.83	43.22	75.72	56.23
Boat Ramp	36.59	22.52	37.55	33.56	52.14	40.00	49.36	46.11	50.82	26.14	50.00	23.08	33.00	21.55	41.51	35.59	44.00	32.14
Nature Trail	0.00	4.64	1.69	1.37	3.57	2.67	5.81	9.33	4.92	4.54	0.00	1.54	6.00	2.21	0.00	2.54	3.57	3.94
Drinking Water	52.44	39.07	68.35	54.79	72.86	64.67	78.71	71.50	55.74	47.73	38.46	4.62	74.00	34.29	45.28	44.92	68.68	48.90
Electric Hookups	19.51	23.18	31.22	21.92	7.86	9.33	34.52	27.46	3.28	0.00	23.08	4.62	37.00	10.50	0.00	0.00	25.07	14.29
Dump Station	10.98	13.91	9.71	8.90	9.29	8.67	16.45	15.03	1.64	5.68	15.38	1.54	20.00	2.76	0.00	0.00	11.99	7.97
Playground	19.51	17.88	3.37	6.16	9.29	4.00	3.23	10.36	14.75	9.09	0.00	1.54	0.00	3.32	5.66	9.32	5.85	8.06
Other	13.42	20.54	5.06	13.01	7.86	10.67	5.48	7.77	13.12	11.36	3.85	50.77	1.00	24.86	20.76	18.64	7.14	17.49

Table 3.10 Recreational Area Improvements[a] Suggested by Recreationists, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in Percent)

	Keystone		Fort Gibson		Eufaula		Tenkiller		Oologah		Oklahoma Main Channel		Arkansas Above Little Rock		Arkansas Below Little Rock		Total Sample	
	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975
Boat Launching Ramps	8.54	4.64	3.80	7.53	2.86	2.67	8.06	6.22	11.48	2.27	0.00	3.08	2.00	6.63	15.09	7.63	6.14	5.40
Camping Sites	19.51	9.27	7.17	10.27	4.29	8.67	14.52	11.92	16.39	9.09	7.69	9.23	2.00	9.39	28.30	11.02	11.20	9.98
Swimming Areas	26.83	17.22	13.92	13.70	11.43	6.67	16.45	18.14	22.95	12.50	11.54	10.77	17.00	17.68	22.64	16.10	16.65	14.65
Fish Stocking	9.76	7.95	13.08	8.22	7.86	4.67	11.29	5.70	3.28	9.09	38.46	7.69	29.00	8.29	9.43	5.93	12.98	7.05
Access Roads	6.10	3.97	0.42	2.74	0.71	5.33	2.58	3.11	6.56	4.54	0.00	3.08	0.00	4.97	0.00	11.02	1.88	4.76
Flush Toilets	14.63	11.92	25.74	23.97	21.43	16.67	33.55	26.42	32.78	14.77	42.31	21.54	49.00	16.58	39.62	29.66	30.53	20.24
Showers	23.17	9.93	28.69	24.66	21.43	18.67	41.61	30.57	34.43	18.18	42.31	10.77	65.00	17.68	37.74	21.19	35.98	19.96
Dump Stations	4.88	2.65	2.11	2.06	2.14	1.33	2.58	1.55	3.28	4.54	0.00	0.00	1.00	2.76	5.66	2.54	2.58	2.20
Pull Through Sites	4.87	2.65	0.84	2.06	0.00	4.00	0.65	3.63	6.56	2.27	0.00	1.54	1.00	3.32	3.77	0.85	1.49	2.75
Drinking Water	NA	11.92	NA	8.22	NA	7.33	NA	9.33	NA	6.82	NA	27.69	NA	13.81	NA	16.95	NA	11.72
Electric Hookups	17.07	15.89	27.00	24.66	40.00	40.00	24.84	20.72	26.23	26.14	7.69	10.77	25.00	21.55	32.08	30.51	26.86	24.27
Water Hookups	NA	8.61	NA	15.75	NA	13.33	NA	12.44	NA	10.23	NA	4.62	NA	12.16	NA	15.25	NA	12.09
Other	51.22	27.82	38.82	76.71	47.14	23.33	35.16	23.32	44.26	20.46	26.92	27.69	32.00	29.83	35.85	23.73	39.05	25.09
None	13.42	32.45	21.10	30.82	12.86	22.67	13.87	23.32	16.39	38.64	7.69	30.77	9.00	24.86	11.32	19.49	14.77	27.02

[a]The question was asked in terms of "more or better" facilities.

attachment to the so called "creature comforts" of city life. The recreationist leaving the city is only trying to leave the discomforts of his urban environment, not necessarily the comforts.

Various problems which were cited by recreationists are presented in Table 3.33. The distribution reflects recreationists' response to which of these problems are most important to them. Although the exact response varies from lake to lake and year to year, about one-half of the respondents indicated that they did not think there are any problems at all.

Of those specified categories remaining, it is extremely difficult to pick a single most important problem overall. Each lake or project tends to have its own most serious problem. And, each year may bring on different problems. At Keystone Lake in 1974, for example, littering ranked as the number one problem, while Fort Gibson Lake users suggested that noise problems tended to be the biggest problem in 1974. This findings in itself is indicative of the problem of "good" outdoor recreation management. A "good" policy at one lake may not be as "good" as another.

Table 3.33 Most Important Problem Around Recreation Areas as Cited by On-Site Recreationists by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in Percent)

	Keystone		Fort Gibson		Eufaula		Tenkiller		Oolagah		Oklahoma Main Channel		Arkansas Above Little Rock		Arkansas Below Little Rock	
	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975
Littering	26.83	11.92	8.86	5.48	10.00	4.67	6.77	6.36	6.56	6.82	7.69	15.38	0.00	11.60	7.55	8.48
Trash Collection	1.22	2.65	1.27	0.68	0.71	0.00	1.29	0.52	1.64	2.27	0.00	0.00	0.00	0.55	0.00	0.00
Dirty Toilets	13.42	4.64	11.39	12.33	10.71	3.33	10.97	8.81	19.67	4.54	3.85	13.85	0.00	7.74	16.98	8.48
Maintenance of Grassed Areas	0.00	0.66	2.11	6.22	2.86	1.33	3.87	2.07	3.28	7.96	7.69	6.15	3.00	8.84	11.32	11.86
Noise Problems	4.89	2.65	13.08	10.27	11.43	8.67	12.90	12.95	1.64	3.41	7.69	0.00	7.00	3.32	0.00	1.70
Safety Problems	4.89	1.32	9.71	3.42	0.71	0.00	6.13	2.07	0.00	2.27	3.85	0.00	1.00	2.76	0.00	1.70
Road Dust	1.22	0.00	1.27	0.00	3.57	0.67	1.61	0.00	6.56	0.00	0.00	0.00	0.00	0.00	0.00	0.85
Need for Security Patrol	7.32	3.31	6.75	7.53	10.00	3.33	8.39	7.77	3.28	0.00	7.69	1.54	0.00	1.66	0.00	5.93
Other	13.42	9.93	8.44	9.59	12.14	12.00	15.16	10.36	9.84	12.50	7.69	12.31	7.00	10.50	9.43	16.10
None	21.95	62.91	36.29	41.78	35.71	66.00	32.26	48.71	47.54	60.23	53.85	50.77	82.00	52.49	54.72	44.92
No Response	4.88	0.00	0.84	0.68	2.14	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	0.00

RECREATION EXPENDITURES AND INVESTMENTS

Over 27 million visitor days were recorded during 1975 in the McClellan-Kerr Arkansas River Navigation System. This is about 1.6 million more visitor days in 1975 than in 1974. An estimated 5,788 seasonal or permanent residences are located near the U.S. Army Corps lakes and are there because of amenities provided by the lakes and water-based facilities. The previous sections describe the characteristics of the users of the facilities and the extent of their participation in outdoor water-based recreation activities. The present section quantifies expenditures of the average recreationist and the total expenditures of all recreationists using the facilities on the river navigation system. Such estimates provide a basis for determining the economic impact of water-based recreation activities and for planning the future development of the region.

This section presents estimates of: (1) current recreation expenditure patterns of on-site recreationists and seasonal and permanent recreation home owners; (2) private investments in recreation equipment and homes; and, (3) aggregate expenditures and investments classified by input-output sectors. The latter results are for purposes of integrating recreation expenditures and investments into the empirically estimated interregional input-output model of the Institute for Water Resources.[1] The present study is a major attempt at linking U.S. Army Corps visitation data and input-output final demand vectors of recreation consumption expenditures and private recreation capital formation.

Recreation Expenditure Patterns

Expenditure patterns are estimated using results of the survey instruments administered during the 1974 and 1975 recreation seasons. The survey instruments and sampling procedures were discussed in Chapter II. The instruments are also reproduced in an appendix of this report. Results are presented as expenditures per visitor day for recreationists visiting any of the public use areas along the navigation system and as expenditures per household for persons occupying seasonal and permanent recreation homes. Since estimation procedures are different for the two recreation groups, expenditure results are presented separately for each group.

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[1] "An Application of the Interregional I/O Model for the Study of the Impact of the McClellan-Kerr Arkansas River Multiple Purpose Project", prepared by Dr. Ungsoo Kim for the Institute for Water Resources, March, 1975.

Visitor Day Expenditures

Results of the surveys are presented as estimates of expenditures per visitor day for each lake or lock and dam. Data for 1974 are presented in Table 4.1 and for 1975 in Table 4.2 A visitor day refers to a visit by one individual to a public use area for recreation purposes for any portion of a 24-hour period measured from midnight. The overall average expenditure per visitor day in the 1974 season was $5.10 for trip expenditures and $4.52 for annual expenditures for a grand total expenditure of $9.62 (Table 4.1). Comparable 1975 data were $6.01 per visitor day for trip expenditures, $3.53 for annual expenditures for a total of $9.54 per visitor day (Table 4.2). Trip expenditures refer to expenditures incurred during one particular outing for lodging, food and beverages, transportation, and recreation related activities. Annual expenditures for boating, fishing, skiing, and camping refer to expenditures incurred not only for that particular outing but for the entire recreation season. The data in Tables 4.1 and 4.2, however, show the prorated expenditure for <u>each</u> visitor day of the total recreation year. These expenditures do not include investments in major recreation equipment items such as boats, campers and tents. These latter expenditures were also estimated and are presented in the next section. Expenditures presented in Tables 4.1 and 4.2 are referred to as current expenditures and occur each year.

Variations in expenditures among lakes appear to be generally randomly distributed and are not significantly different from each other within a particular expenditure category. Overall expenditure per visitor day is computed as a weighted average where lake or area visitation data are used as weights. The total weighted average is about $9.50 per visitor day for each of the two years although trip expenditure is about one dollar more in 1975 than 1974 ($6.01 versus $5.10) and annual expenditure is about one dollar less in 1975 than in 1974 ($3.53 versus $4.52).

Certain variations in expenditures between categories and among lakes may be noted:

1. The major expenditure category is for food and beverages and accounts for about one-third of total expenditures.

2. Transportation expenditures is the second largest category but accounts for only about 15 percent of total expenditures. Transportation costs include only vehicle variable costs and not depreciation.

3. Annual expenditures for boating, fishing and camping are relatively similar in magnitude.

4. Few consistent variations among lakes for the two years are evident. Tenkiller and the area, Arkansas Above Little Rock, have higher than average transportation costs which is consistent with earlier data on distance travelled to reach the lake. Similarly,

Table 4.1: Estimated Expenditures Per Visitor Day by Lake or Lock and Dam, McClellan-Kerr Arkansas River Navigation System, 1974

(Figures in Dollars)

Expenditure Category	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock	Overall Average
Trip Expenditures									
Lodging	.0582	.3880	.2875	.2800	.2798	.2168	.5169	.0081	.2820
Food and Beverages	3.5373	3.3051	2.2282	2.9183	2.7597	2.9768	3.9731	2.4249	3.0287
Transportation	.9487	1.2287	.9636	1.3627	.7312	1.4170	2.6195	1.0598	1.3892
Recreation Activities	.2342	.2289	.4199	.2959	.1102	.2441	.3084	.4005	.2932
Other	.1521	.0911	.0760	.0966	.0526	.1176	.1075	.1823	.1117
Total	4.9305	5.2418	3.9752	4.9535	3.9335	4.9723	7.5254	4.0756	5.1048
Annual Expenditures									
Boating	1.9158	.8792	1.4373	1.0790	.4698	.8024	.4067	1.7646	1.3443
Fishing	1.1365	.6855	.8584	.9266	1.6460	1.1322	.9461	1.3900	1.1164
Skiing	.6164	.2373	.3068	.1513	.0170	.2643	.1422	.3310	.3284
Camping	2.6516	.8364	1.4399	1.1238	1.7013	1.0368	.9431	1.2478	1.7275
Total	6.3203	2.6384	4.0424	3.2807	3.8341	3.2357	2.4381	4.7334	4.5166
Grand Total	11.2508	7.8802	8.0176	8.2342	7.7676	8.2080	9.9635	8.8090	9.6214

Table 4.2: Estimated Expenditures Per Visitor Day by Lake or Lock and Dam, McClellan-Kerr Arkansas River Navigation System, 1975

(Figures in Dollars)

Expenditure Category	Keystone	Fort Gibson	Eufaula	Tenkiller	Oologah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock	Overall Average
Trip Expenditures									
Lodging	.2814	.3378	.6788	.4734	.1364	.2234	.2959	.1306	.3815
Food and Beverages	2.9598	3.2108	3.9147	3.8269	3.3912	2.8535	3.0878	2.8685	3.3771
Transportation	1.3597	.9871	1.4507	1.7754	1.4136	1.3608	1.5550	1.2801	1.4303
Recreation Activities	.9444	.8940	.7772	.7001	.6398	.6423	.4535	.3342	.7015
Other	.1219	.0743	.1309	.1195	.1132	.0491	.1112	.3246	.1241
Total	5.6672	5.5040	6.9523	6.8953	5.6942	5.1291	5.5034	4.9380	6.0145
Annual Expenditures									
Boating	1.3290	1.1933	1.2888	1.1615	1.1749	.6413	.7739	.3399	1.0586
Fishing	1.1473	.8652	.6934	1.1484	.9616	1.4577	1.0852	1.0692	1.0147
Skiing	.5690	.1085	.1556	.1587	.0700	.3609	.0396	.0812	.1811
Camping	1.2882	1.3819	1.3256	1.4311	1.2152	.6767	1.2705	.9216	1.2726
Total	4.3335	3.5489	3.4634	3.8997	3.4217	3.1366	3.1692	2.4119	3.5270
Grand Total	10.0007	9.0529	10.4157	10.7950	9.1159	8.2657	8.6726	7.3499	9.5415

Keystone shows relatively low transportation costs for both years, which is consistent with shorter average distance travelled to reach the lake.

Aggregate recreation expenditures are estimated for the entire navigation system by multiplying average visitor day expenditures by the reported U.S. Army Corps visitor days (Table 4.3). Visitor days are grouped into two time periods: (1) seasonal, May thru September and (2) off-season, October thru April. The survey results are statistically valid only for the recreation season. No interviewing was done during the off-season period.[1] Visitation data show, however, that a substantial amount of recreation activity still occurs during the off-season periods. During the 1974-75 period the off-season visitation amounted to about one-third of the total annual visitor days.

Off-season visitor day expenditures were assumed to be 60 percent of that estimated for seasonal expenditures using our survey results. At least two reasons may be given to justify a lower off-season expenditure. First, it is expected that more of the recreationists during the off-season will be local residents. This would indicate shorter travel distances, shorter length visits, and hence fewer camping type activities. Secondly, the mix of activities is expected to be different during the two periods. During the off-season there would be less camping and boating but proportionately more local fishing than during the main recreation season.

Aggregate expenditures are estimated at about $193 million for 1974 and about $224 million for 1975. The off-season expenditures are conservatively estimated and amount to about one-fourth of total annual expenditures. Recreation activity in Arkansas does not follow the Oklahoma seasonal pattern in that visitations in the Arkansas segment of the study area are more evenly distributed throughout the year with about 45 percent of the visitor days occuring during the October to April period and about one-third of the estimated annual expenditures occuring during this period.

Expenditures were further classified as to location of purchase. The main criteria was whether the purchase occured within the region or outside the region. Figure 1 in Chapter I depicts the "inside region" and "outside region" boundary. The purpose was to determine local and regional impact of expenditures. A later section gives greater detail on location of purchase for individual expenditure items but the overall survey results show that about three-fourths of the trip and annual expenditures took place within the broad region of the navigation system.

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[1] The only exception to this were the 25 surveys taken at Lake Dardanelle in October, 1974. However, 25 surveys from over 2,100 surveys allows no valid interpretation of off-season expenditures.

Table 4.3: Estimated Aggregate Expenditures by Lake and Area, Seasonal and Off-Season, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

Lake or Area	1974				1975			
	Recreation Season (May - Sept.)		Off-Season[a] (Oct. - April)		Recreation Season (May - Sept.)		Off-Season[a] (Oct. - April)	
	Visitor Days (1,000)	Aggregate Expenditures ($1,000)	Visitor Days (1,000)	Aggregate Expenditures ($1,000)	Visitor Days (1,000)	Aggregate Expenditures ($1,000)	Visitor Days (1,000)	Aggregate Expenditures ($1,000)
Keystone	2,823.7	31,769	850.5	5,741	2,175.4	21,756	846.3	5,078
Fort Gibson	2,207.9	17,399	1,875.2	8,866	2,930.7	26,531	1,179.5	6,407
Eufaula	2,664.9	21,366	1,897.5	9,128	3,221.5	33,554	1,473.0	9,205
Tenkiller	3,484.1	28,689	1,517.4	7,497	3,790.8	40,922	1,435.5	9,298
Oologah	804.1	6,246	414.8	1,933	959.5	8,747	461.6	2,525
Oklahoma Main Channel	828.4	6,800	488.6	2,406	1,308.7	10,817	819.5	4,064
Arkansas Above Little Rock	1,875.4	18,686	1,853.9	11,083	2,464.2	21,371	1,865.6	9,708
Arkansas Below Little Rock	1,269.7	11,185	810.4	4,283	1,340.6	9,853	1,007.3	4,442
Total	15,958.7	142,140	9,708.3	50,937	18,191.4	173,551	9,088.3	50,727

[a] Off-season represents attendance from January through April and from October through December of the respective years.

Visitor Day Expenditures by Major Activity

One of the early hypotheses of the study was that expenditures were expected to vary significantly by type of activity in which recreationists were engaged. Questionnaire data have been classified by major activity and expenditures per visitor day computed for the 1974 and 1975 samples (Tables 4.4 and 4.5). In the 1974 interview process, the interviewer selected recreation groups according to a perdetermined sampling design to obtain a given number of surveys in each of the major activity groups. If a group was boating while the interviewer was at the recreation area, that group was classified in the major activity of boating.

For the 1975 interview process, public use areas were randomly selected and interviews of recreation groups randomly selected by the interviewer within the public use area. Each recreation group was required to specify their major activity. Results of this interview process are presented in Table 4.5 as expenditures per visitor day by designated major activity.

Comparisons between years and among activities result in the following observations:

1. Variations in estimated total expenditures per visitor day are not great among activities. Excluding the atypical result for sightseeing in 1975, which is probably due to small sample size, the variation in expenditures is less than $4 per day between the highest expenditure activity and the lowest expenditure activity.

2. Comparisons between 1974 and 1975 are very consistent within the same major activity group. Differences between years are less than one dollar except for sightseeing and picnicing.

3. Picnicing, swimming and fishing are consistently the lower expenditure value activities and boating, camping and skiing are consistently the higher expenditure value activities.

4. Because a large proportion of the recreationists participate in several activities the classification of a major activity loses its significance.

Seasonal and Permanent Recreation Home Expenditures

For the 1974-75 period an estimated 5,788 residences were located near the lakes and river system and served as either seasonal or permanent homes. An exact count of the number of residences serving only as seasonal homes was not available but in a sample of 270 homes surveyed, 21 percent used their homes for only a part of each year.

Table 4.4: Estimated Expenditures Per Visitor Day by Major Activity, McClellan-Kerr River Navigation System, 1974

Expenditure Category	Camping	Picnicking	Boating	Fishing	Sightseeing	Skiing	Swimming
No. of Observations	326	41	136	303	14	130	48
Trip Expenditures							
Lodging	$ .5253	----	$ .5657	$ .3361	$ .0952	$ .3476	$ .4496
Food and Beverages	4.0199	$2.8688	4.1239	3.6281	1.5614	3.4913	3.7011
Transportation	2.1244	2.0139	1.4932	1.4166	.7695	1.0776	1.7552
Recreation Activit	.1979	.0243	1.1061	.4365	.0714	1.0650	.0823
Other	.1645	.1518	.1130	.0756	.0976	.1019	.1770
Total	$7.0320	$5.0588	$7.4019	$5.8929	$2.5951[a/]	$6.0834	$6.1652
Annual Expenditures							
Boating	$1.0002	$1.7033	$2.3625	$1.1457	$1.5890	$1.4815	$ .4875
Fishing	1.0922	1.2152	1.0245	1.1496	1.0979	1.2516	1.0179
Skiing	.2137	.0856	.3204	.2212	.5633	.3651	.3208
Camping	1.3858	.7309	1.0566	1.3527	2.9501	1.1380	1.1215
Total	$3.6919	$3.7350	$4.7640	$3.8692	$6.2003[a/]	$4.2362	$2.9477
Grand Total	$10.7239	$8.7938	$12.1659	$9.7621	$8.7954[a/]	$10.3196	$9.1129

[a/] See page in text of report for explanation of these figures.

Table 4.5: Estimated Expenditures Per Visitor Day by Major Activity, McClellan-Kerr River Navigation System, 1975

Expenditure Category	Camping	Picnicking	Boating	Fishing	Sightseeing	Skiing	Swimming
No. of Observations	300	89	51	403	16	83	128
Trip Expenditures							
Lodging	$ .5845	$ .0072	$ .3521	$ .3055	$ .0904	$ .4169	$ .1574
Food and Beverages	3.7902	3.0169	4.0729	3.0489	6.1235	3.8709	2.3608
Transportation	1.5774	.7307	1.4762	1.3947	2.1353	1.2958	1.5508
Recreation Activities	.6983	.5209	1.0136	.5825	.6858	1.0308	.7783
Other	.1340	.0910	.1108	.1036	.5297	.1426	.1947
Total	$6.7844	$4.3687	$7.0256	$5.4352	$9.5647	$6.7570	$5.0420
Annual Expenditures							
Boating	$1.1994	$ .7628	$1.7732	$ .8640	$1.5963	$1.0003	$1.1170
Fishing	.9818	1.2014	.9064	1.0990	1.0517	.8785	.9839
Skiing	.1923	.1310	.2312	.2297	.1343	.1869	.1804
Camping	1.4353	1.0313	1.4829	1.3258	1.3452	.9012	1.0389
Total	$3.8088	$3.1265	$4.3937	$3.5185	$4.1275	$2.9669	$3.3202
Grand Total	$10.5932	$7.4932	$11.4193	$8.9537	$13.6922	$9.7239	$8.3622

The 1974-75 average annual expenditure per household of seasonal residents for transportation, food and beverages, and utilities was estimated at $1,210.58 (Table 4.6). Of this total, 77 percent was purchased within the general region of the river system. Expenditures for recreation activities of boating, fishing, skiing, camping, hunting, and other activities averaged $253.66 per household for seasonal and permanent home residents. About 69 percent of these expenditures were made within the region.

Survey results are presented for each year in Table 4.6 plus the 1974-75 average. The latter estimate, 1974-75 average, is recommended as the more representative statistic of the entire system.

Aggregate expenditures are presented in Table 4.7 for the estimated population of 5,788 residences. Distribution between seasonal and permanent homes is assumed at 21 percent and 79 percent, respectively, for each of the lakes or areas although we know this varies substantially from lake to lake. The aggregate expenditure by seasonal residents for transportation, food and beverages, and utilities is about $1.5 million annually. The aggregate expenditure by all residences on boating, fishing, skiing, camping and hunting is also about $1.5 million annually.

Private Investments in Recreation Equipment and Homes

The previous section presented current expenditures on recreation activities or those expenditures on goods and services used up during the particular recreation trip or during the season. In addition to current expenditures, recreationists invest in equipment and recreation homes that are not used up during one season but last for several seasons. Survey data on value of recreation equipment and facilities inventory are used to develop an average recreation "capital-output" ratio and estimates of aggregate investments in equipment and homes for the Arkansas river navigation system region.

Recreation Equipment Investment by On-Site Recreationists

Data on the kind, quantity and estimated market value of recreation equipment that on-site recreationists had with them at the public use areas was obtained in the 1975 survey. Similar data were obtained for 1974 but without the estimate of market value. In addition, information on approximate age of the equipment, city where purchased, percent of use for recreation purposes and other physical descriptions of the inventory was obtained. Items in the inventory included canoes, boats, motors, boat trailers, skiing equipment, tents, camper trailers, tent trailers, pick-up campers, motor homes, bicycles, minibikes, motorcycles, awnings and canopies, and surfboards.

The sample data of the value of recreation equipment for each of the lakes or areas for 1975 are presented in Table 4.8. Also, the number of

Table 4.6: Annual Expenditure Per Household for Seasonal and Permanent Recreation Home Owners, McClellan-Kerr Arkansas River System, 1974 and 1975

(Dollars)

Expenditure Item	1974 Estimated Annual Expenditure Per Household	1975 Estimated Annual Expenditure Per Household	1974-75 Average	Percent Expended In Region
Seasonal Residents[a]				
Transportation	232.21	318.06	289.45	72.9
Food and Beverages	492.89	725.58	648.02	70.0
Utilities	238.82	290.25	273.11	100.0
Total	963.92	1,333.89	1,210.58	77.5
Seasonal and Permanent Residents[b]				
Boating	116.43	167.89	141.24	73.2
Fishing	62.77	79.74	70.94	75.6
Skiing	3.83	3.73	3.78	44.8
Camping	6.15	5.33	5.74	87.0
Hunting	17.27	13.09	15.27	47.2
Other	28.11	4.39	16.69	23.7
Total	234.56	274.17	253.66	68.9

[a]1974 estimate based on 19 observations.
1975 estimate based on 38 observations.

[b]1974 estimate based on 140 observations.
1975 estimate based on 130 observations.

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Table 4.7: Estimated Number of Seasonal and Permanent Recreation Homes and Aggregate Annual Expenditures, McClellan-Kerr Arkansas River Navigation System, 1974-75 Period

Lake or Area	Estimated Number of Residences	Aggregate Expenditures for Transportation, Food and Beverages and Utilities[a] ($1,000)	Aggregate Expenditures for Boating, Fishing Skiing, Camping and Hunting[b] ($1,000)
Keystone	604	153	153
Fort Gibson	1,465	372	372
Eufaula	2,432	617	617
Tenkiller	995	252	252
Arkansas	292	74	74
Total	5,788	1,468	1,468

[a]These expenditures are computed for seasonal home residences only. Seasonal homes are estimated at 21 percent of the total.

[b]These expenditures apply to all recreation home owners.

Table 4.8: Value of Recreation Equipment for Sample of On-Site Recreationists, McClellan-Kerr Arkansas River Navigation System, 1975

Equipment Item	Keystone	Fort Gibson	Eufaula	Tenkiller	Oolagah	Oklahoma Main Channel	Arkansas Above Little Rock	Arkansas Below Little Rock
				(Figures in Dollars)				
Canoe	--	100	--	--	--	--	--	--
Boat	54,593	56,553	80,689	116,996	29,901	16,225	32,415	24,194
Motor	43,774	43,169	62,067	88,286	19,218	17,075	24,909	21,511
Boat Trailer	8,817	10,828	13,025	18,057	6,206	3,495	7,290	5,542
Skiing Equipment	1,713	1,421	3,430	3,295	495	570	645	526
Tent	1,469	2,273	3,349	3,945	1,209	245	2,026	1,953
Camper Trailer	61,950	84,800	86,750	154,450	9,950	9,825	90,950	38,600
Tent Trailer	2,000	18,330	13,450	18,745	4,500	1,500	10,600	7,038
Pick-up camper	40,700	42,850	45,415	34,330	25,025	10,320	18,080	850
Pick-up (rec. use)	53,990	47,368	66,434	62,788	27,725	24,146	34,600	18,287
Motor Home	75,700	34,100	32,300	100,700	45,300	4,500	54,300	12,900
Bicycles	1,277	1,034	1,334	1,752	170	30	295	595
Minibikes (rec. use)	--	--	--	200	--	--	1,500	--
Motorcycles (rec. use)	4,350	1,880	5,410	7,680	2,085	950	1,800	600
Other	475	5,857	1,173	2,625	410	210	183	475
Total Sample	350,808	350,563	414,826	613,849	172,194	89,091	279,593	133,071
Total Annual Visitor Days of Sample	21,223	24,727	23,472	26,328	7,519	8,070	27,414	22,328
Equipment Value Per Visitor Day ($)	16.5296	14.1773	17.6732	23.3154	22.9012	11.0398	10.1989	5.9598

annual visitor days associated with this equipment inventory was obtained from the survey so that the last row in Table 4.8 is an estimate of the equipment value per visitor day. Several characteristics of this statistic should be mentioned:

1. The intensity of use of recreation equipment is important for determining the magnitude of the equipment value per visitor day. The more frequently on-site recreationists use the equipment in a year, the lower is the equipment value per visitor day.

2. Equipment value per visitor day is not an estimate of the cost of equipment used up that visitor day. If a depreciation rate is determined then the cost of equipment used up can be estimated. Depreciation rates can be estimated on the basis of expected hours of use or on the basis of years of life. Generally, equipment with heavy use is depreciated on the hours of use basis whereas equipment that may become obsolete with age due to new technologies is depreciated by age of equipment. Recreation equipment more generally can be considered as the latter case. Average length of life for the equipment items listed in Table 4.8 can be considered about 10 years. Hence the depreciation rate is equal to 10 percent and the amount of recreation equipment used up per visitor day is equal to one-tenth of the equipment value per visitor day.

3. Equipment value per visitor day can be considered as the private "capital-output" ratio for the on-site recreation enterprise. That is, output is defined as recreation visitor days for which the U.S. Army Corps provides annual estimates. Capital is the average investment in recreation equipment per visitor day. The value of recreation equipment needed for projected increases in visitor days is obtained by multiplying the capital-output ratio (the equipment value per visitor day) by the projected increase in visitor days. This estimate assumes the average complement of recreation equipment as estimated from our sample and the average intensity of use as for our sample. It also assumes the additional or marginal visitor day takes on the equipment value of the average visitor day as computed from the sample.

The estimates of equipment value per visitor day vary significantly from lake to lake. Tenkiller and Oolagah show high values of equipment inventory per visitor day relative to the lower values for recreationists along the main channel in Oklahoma and Arkansas. The overall weighted capital-output ratio is about 15.66. Total aggregate value of recreation equipment is estimated at over $427 million (Table 4.9). Recreationists using facilities at Lake Tenkiller have an estimated value of recreation equipment of almost $122 million.

In addition to the private recreation capital-output ratio it is possible to compute the public sector capital-output ratio. Cost of roads, boat ramps, picnic tables, shelters, water and sewer lines, toilets and showers, trash barrels, and other facilities all make up the investment in public use areas to permit visitor day recreation output. Collection of user fees at certain public use areas helps recover a proportion of the investment and maintanence and operation costs.

Table 4.9: Estimated Aggregate Value of Recreation Equipment of On-Site Recreationists, McClellan-Kerr Arkansas River Navigation System, 1975

Lake or Area	Equipment Value per Visitor Day ($)	Number of Visitor Days (1,000)	Aggregate Value of Recreation Equipment ($1,000)
Keystone	16.53	3,021.7	49,949
Fort Gibson	14.18	4,110.2	58,283
Eufaula	17.67	4,694.5	82,952
Tenkiller	23.32	5,226.3	121,877
Oolagah	22.90	1,421.1	32,543
Oklahoma Main Channel	11.04	2,128.2	23,495
Arkansas Above Little Rock	10.20	4,329.8	44,164
Arkansas Below Little Rock	5.96	2,347.9	13,993
Total	15.66	27,279.7	427,256

Investments of Seasonal and Permanent Recreation Home Owners

Value of recreation equipment was similarly estimated for seasonal and permanent recreation home owners and is presented in Table 4.10. In defining a capital-output ratio for recreation home owners, output is not defined in terms of visitor days but rather in terms of a recreation season per household. Average value of recreation equipment per household is estimated at about $2,988 for seasonal residents and $1,720 for permanent residents (Table 4.10). The aggregate value of recreation equipment for all seasonal home owners is about $3.6 million and $7.9 million for permanent home owners. Assuming a 10 percent depreciation rate the annual value of recreation equipment used up is about $1,150,000 for all recreation home owners.

The estimated value of recreation home real estate is presented in Table 4.11. Recreation homes are classified as seasonal and permanent and each classification is separated according to mobile homes or constructed homes. Approximately 68 percent of the seasonal homes are mobile homes versus 20 percent for permanent homes. Average value of the mobile homes is similar for both seasonal and permanent home owners at slightly over $8,000. Fifty-three percent of the seasonal mobile home owners rented their lot versus 19 percent of the permanent mobile home owners. Rental values are contained in the current expenditures for utilities. Average value of lot for those owned by mobile home owners was $2,831 for seasonal residents and $3,059 for permanent residents.

Average value of constructed homes was about $19,600 for seasonal homes and $27,300 for permanent homes. Average value of lots was $4,700 for seasonal homes and $5,300 for permanent homes.

The aggregate real estate value of the 5,788 seasonal and permanent recreation homes is estimated at about $146 million in current market values. This is an average of over $25,000 per recreation home . Value of mobile and constructed homes represents the depreciable assets of recreation home real estate and is estimated at about $121.7 million. Assuming a 40 year life on such assets yields an annual depreciation of about $3 million.

Aggregate Expenditures and Investments Classified by Input-Output Sectors

One of the primary objectives of the present study was to estimate recreation expenditures for current consumption and investment in such a manner that through integration with the U.S. Army Corps of Engineers' interregional input-output model it would be possible to determine direct and indirect impacts of expenditures both within the delineated river system region and outside the region. This was made possible by designing the survey instrument in such a way that expenditures could be allocated to the individual sectors of the interregional input-output model. The method for allocating expenditures to the different input-output sectors is presented in Appendix C.

Table 4.10: Value of Recreation Equipment for Seasonal and Permanent Recreation Home Owners, McClellan-Kerr Arkansas River Navigation System, 1974-75 Combined Average

Equipment Item	Seasonal Home		Permanent Home	
	Dollars	Percent Expended In Region	Dollars	Percent Expended In Region
Average per Household[a]				
Canoe	--	--	2.66	100.0
Boat	1,509.73	46.2	642.78	89.8
Motor	972.16	50.2	440.77	79.7
Boat trailer	195.54	57.2	102.16	80.8
Skiing equip.	31.49	39.5	13.94	80.9
Tent	2.84	0.0	5.85	68.2
Camper trailer	162.16	50.0	148.94	14.3
Pick-up camper (rec. use)	32.43	0.0	120.47	52.3
Motor home	--	--	12.77	100.0
Bicycles	6.62	14.3	14.86	74.4
Minibikes (rec. use)	14.86	63.6	10.11	100.0
Motorcycles (rec. use)	41.35	47.7	38.78	72.6
Other	18.92	0.0	166.33	100.0
Total	2,988.10	47.6	1,720.42	78.0
Total Aggregate Value[b]	3,630,542.00	47.6	7,867,481.00	78.0

[a]Seasonal home average based on 57 observations and permanent home average based on 213 observations.

[b]Estimated number of seasonal homes is 1,215 and estimated number of permanent homes is 4,573.

Table 4.11: Value of Seasonal and Permanent Recreation Homes, McClellan-Kerr Arkansas River Navigation System, 1974-75 Combined Average

	Seasonal	Permanent
Sample Size	56	215
Mobile Homes		
Percent of sample	68	20
Average value of home ($)	8,131.58	8,298.57
Lot		
Percent rented	53	19
Average value of owned lot ($)	2,831.25	3,058.82
Constructed Homes		
Percent of sample	32	80
Average value of home ($)	19,561.11	27,264.72
Average value of lot ($)	4,702.78	5,266.71
Aggregate Value		
Mobile Homes		
Estimated Number	806	915
Value of homes ($)	6,716,685	7,593,192
Value of owned lots ($)	1,098,525	2,266,586
Total ($)	7,815,210	9,859,778
Constructed Homes		
Estimated Number	389	3,658
Value of homes ($)	7,609,272	99,734,346
Value of lots ($)	1,829,381	19,265,625
Total ($)	9,438,653	118,999,971
Total		
Estimated Number	1,215	4,573
Value of homes ($)	14,325,957	107,327,538
Value of lots ($)	2,927,906	21,532,211
Total ($)	17,253,863	128,859,749

This section presents the distribution of a dollar of recreation current expenditures and recreation equipment expenditures by input-output sectors for on-site recreationists and recreation home owners. Also presented in this section is the estimated aggregate current expenditures for consumption and capital formation for the year 1975.

Current Recreation Expenditures

The distribution of on-site recreation expenditures was classified by input-output sector for the years 1974 and 1975, respectively.[1] These expenditures correspond to the trip and annual expenditures of recreationists counted at the 205 recreational areas in Oklahoma and Arkansas along the navigation system. The aggregate data correspond to that given in Table 4.3 above. The first four columns of Tables 4.12 and 4.13 present data on total expenditures of recreationists and the last four columns present data on expenditures occurring within the study region. For 1974, 76.8 percent of total expenditures occurred within the region. The 1975 survey showed that 73.2 percent of total expenditures occurred within the region.

The input-output sector distribution of aggregate expenditures for the recreation season of May thru September is presented in column one in purchasers' value. The input-output sector distribution per dollar expended by on-site recreationists for trip and annual expenditures is indicated in column two. Over $37 million was spent for food and kindred products in 1974 or about 26 cents of each recreation dollar. Almost $25 million was spent for petroleum products in 1974 or about 17.5 cents of each recreation dollar. For 1975, 30 cents of each recreation dollar was spent for food and kindred products and 23 cents for petroleum products.

The data in producers' value, which reduces purchasers' value by the transportation and trade margins, is presented in column three. The difference between what the purchaser paid and the producer received is composed of the wholesale and retail markup and the cost of transporting the product from producer to purchaser. These margins were taken from the Harvard Economic Research Project study.[2] Input-output models are most frequently presented in producers' values. Under producers' value the wholesale and retail trade row shows the largest expenditure value ($47 million in 1974 and $56 million in 1975) or about 33 cents of each recreation dollar in 1974 and 32 cents in 1975.

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[1] The input-output sectoring is consistent with the Harvard Economic Research Project (HERP) sectoring. See Karen R. Polenske, et al. A Guide For Users of the U.S. Multiregional Input-Output Model. Prepared for the Office of Systems Analysis and Information, U.S. Department of Transportation, Washington, D.C., 1973.

[2] Raymond C. Scheppach, Jr. State Projections of the Gross National Project, 1970, 1980. Lexington: Lexington Books, D. C. Heath and Company, 1972, pp. 25-27.

Table 4.12: Distribution of Recreation Expenditures of On-Site Recreationists by Input-Output Sector, McClellan-Kerr Arkansas River Navigation System, May to September, 1974

HERP Code	Sector Description	Total Expenditures				Expenditures Within Region			
		Purchasers' Value		Producers' Value		Purchasers' Value		Producers' Value	
		Total	Per Dollar	Total	Per Dollar	Total	Per Dollar	Total	Per Dollar
		($1,000)		($1,000)		($1,000)		($1,000)	
1	Livestock & Products	1,180	.0083	910	.0064	928	.0085	709	.0065
2	Agricultural Crops	1,933	.0136	1,052	.0074	1,506	.0138	819	.0075
3	Forestry & Fishery Prod.	3,141	.0221	1,322	.0093	2,456	.0225	1,026	.0094
14	Food & Kindred Prods.	37,085	.2609	23,553	.1657	29,521	.2705	18,750	.1718
17	Misc. Textile Goods	313	.0022	156	.0011	251	.0023	120	.0011
19	Misc. Fab. Textile Prod.	*	*	*	*	*	*	*	*
22	Household Furniture	5,018	.0353	2,957	.0208	2,696	.0247	1,593	.0146
27	Chemicals & Prods.	625	.0044	441	.0031	557	.0051	393	.0036
29	Drugs & Cleaning Prods.	1,322	.0093	768	.0054	906	.0083	535	.0049
31	Petroleum Ref. Prods.	24,917	.1753	12,977	.0913	19,383	.1776	10,085	.0924
32	Rubber & Plastic Prods.	5,586	.0393	3,156	.0222	3,885	.0356	2,194	.0201
38	Primary Nonferrous Metal	1,365	.0096	739	.0052	764	.0070	415	.0038
40	Heat., Plumb., & Fab. Metal	1,365	.0096	967	.0068	764	.0070	546	.0050
42	Other Fab. Metal Prods.	1,293	.0091	696	.0049	1,004	.0092	546	.0050
54	Household Appliances	2,047	.0144	1,265	.0089	1,157	.0106	720	.0066
55	Electric & Wiring Equip.	2,047	.0144	1,421	.0100	1,157	.0106	797	.0073
58	Misc. Elect. Mach.	14	.0001	14	.0001	11	.0001	11	.0001
59	Motor Vehicles & Equip.	*	*	*	*	*	*	*	*
61	Other Transp. Equip.	6,155	.0433	4,236	.0298	4,966	.0455	3,416	.0313
64	Misc. Manuf.	11,769	.0828	6,851	.0482	9,539	.0874	5,555	.0509
65	Transp. & Warehousing	1,791	.0126	5,373	.0378	1,452	.0133	4,202	.0385
69	Wholesale & Retail Trade	6,936	.0488	47,432	.3337	5,544	.0508	36,320	.3328
70	Finance & Insur.	13,489	.0949	13,489	.0949	9,899	.0907	9,899	.0907
72	Hotels & Lodging	895	.0063	895	.0063	786	.0072	786	.0072
73	Business Services	1,564	.0110	1,564	.0110	1,310	.0120	1,310	.0120
75	Auto Repair Service	441	.0031	441	.0031	196	.0018	196	.0018
76	Amusements	938	.0066	938	.0066	851	.0078	851	.0078
77	Medical & Educ. Serv.	28	.0002	28	.0002	11	.0001	11	.0001
78	Feb. Gov't Enterprise	*	*	*	*	*	*	*	*
79	State & Local Gov't Enterp.	298	.0021	298	.0021	273	.0025	273	.0025
80	Noncompetitive Imports	1,109	.0078	725	.0051	862	.0079	557	.0051
83	Scrap Materials	*	*	*	*	*	*	*	*
	State & Local Gov't	4,477	.0315	4,477	.0315	3,569	.0327	3,569	.0327
	Federal Gov't	2,999	.0211	2,999	.0211	2,936	.0269	2,936	.0269
	Total	142,140	1.0000	142,140	1.0000	109,140	1.0000	109,140	1.0000

Table 4.13: Distribution of Recreation Expenditures of On-Site Recreationists by Input-Output Sector, McClellan-Kerr Arkansas River Navigation System, May to September, 1975

HERP Code	Sector Description	Total Expenditures				Expenditures Within Region			
		Purchasers' Value		Producers' Value		Purchasers' Value		Producers' Value	
		Total	Per Dollar	Total	Per Dollar	Total	Per Dollar	Total	Per Dollar
		($1,000)		($1,000)		($1,000)		($1,000)	
1	Livestock & Products	1,718	.0099	1,320	.0076	1,322	.0104	1,017	.0080
2	Agricultural Crops	2,794	.0161	1,510	.0087	2,161	.0170	1,169	.0092
3	Forestry & Fishery Prod.	451	.0026	191	.0011	356	.0028	153	.0012
14	Food & Kindred Prods.	52,847	.3045	33,565	.1934	41,280	.3248	26,220	.2063
17	Misc. Textile Goods	590	.0034	278	.0016	280	.0022	140	.0011
19	Misc. Fab. Textile Prod.	*	*	*	*	*	*	*	*
22	Household Furniture	2,881	.0166	1,701	.0098	1,792	.0141	1,055	.0083
27	Chemicals & Prods.	677	.0039	469	.0027	534	.0042	381	.0030
29	Drugs & Cleaning Prods.	1,874	.0108	1,093	.0063	1,411	.0111	826	.0065
31	Petroleum Ref. Prods.	40,663	.2343	21,156	.1219	31,939	.2513	16,612	.1307
32	Rubber & Plastic Prods.	3,922	.0226	2,221	.0128	2,542	.0200	1,436	.0113
38	Primary Nonferrous Metal	816	.0047	451	.0026	508	.0040	280	.0022
40	Heat., Plumb., & Fab. Metal	1,232	.0071	885	.0051	763	.0060	547	.0043
42	Other Fab. Metal Prods.	1,007	.0058	538	.0031	737	.0058	407	.0032
54	Household Appliances	1,232	.0071	764	.0044	763	.0060	470	.0037
55	Electric & Wiring Equip.	1,232	.0071	850	.0049	763	.0060	534	.0042
58	Misc. Elect. Mach.	17	.0001	17	.0001	*	*	*	*
59	Motor Vehicles & Equip.	17	.0001	17	.0001	*	*	*	*
61	Other Transp. Equip.	4,964	.0286	3,419	.0197	3,508	.0276	2,415	.0190
64	Misc. Manuf.	12,912	.0744	7,515	.0433	7,740	.0609	4,499	.0354
65	Transp. & Warehousing	2,430	.0140	7,168	.0413	2,224	.0175	5,821	.0458
69	Wholesale & Retail Trade	6,300	.0363	56,004	.3227	4,461	.0351	41,534	.3268
70	Finance & Insur.	16,765	.0966	16,765	.0966	10,003	.0787	10,003	.0787
72	Hotels & Lodging	1,770	.0102	1,770	.0102	852	.0067	852	.0067
73	Business Services	1,996	.0115	1,996	.0115	1,195	.0094	1,195	.0094
75	Auto Repair Service	625	.0036	625	.0036	292	.0023	292	.0023
76	Amusements	729	.0042	729	.0042	674	.0053	674	.0053
77	Medical & Educ. Serv.	17	.0001	17	.0001	*	*	*	*
78	Fed. Gov't Enterprise	*	*	*	*	*	*	*	*
79	State & Local Gov't Enterp.	347	.0020	347	.0020	267	.0021	267	.0021
80	Noncompetitive Imports	1,597	.0092	1,041	.0060	1,233	.0097	801	.0063
83	Scrap Materials	*	*	*	*	*	*	*	*
	State & Local Gov't	4,252	.0245	4,252	.0245	2,669	.0210	2,669	.0210
	Federal Gov't	4,877	.0281	4,877	.0281	4,830	.0380	4,830	.0380
	Total	173,551	1.0000	173,551	1.0000	127,099	1.0000	127,099	1.0000

Recreationists impact directly to some extent on thirty-four different sectors. From 77 to 82 percent of the recreationists' dollar in producers' value comes from six sectors: wholesale and retail trade; food and kindred products; petroleum products; finance and insurance; miscellaneous manufacturing; and, transportation and warehousing. The interdependent input-output model, however, demonstrates that recreationists will impact not only directly on these thirty-four sectors but also indirectly on most all sectors in the economy.

The last four columns of Tables 4.12 and 4.13 indicate the recreation expenditures occurring within the region. Even though the expenditure occurred within the region it is not necessarily true that production of the commodity took place within the region. As an example, even though a major part of all gas and oil for motor boats was purchased within the study region, the major part of the gas and oil was produced outside the region. Interregional trade coefficients need to be applied to the recreation expenditures to determine the local production impact. Nevertheless, some $36 million in 1974 and $41.5 million in 1975 of wholesale and retail trade services was provided within the study region. This sector alone constitutes a substantial impact that recreationists have within the region. Furthermore, the trade occurring between regions emphasizes the impact recreation development along the Arkansas navigation system has not only for this region but all other regions that produce recreation consumption goods.

The distribution of the average dollar spent by seasonal and permanent recreation home owners on transportation, food and beverages, and utilities also was calculated (columns 1-4 in Table 4.14). The last four columns (columns 5-8 in Table 4.14) give the distribution of the average dollar spent by seasonal and permanent recreation home owners on boating, fishing, skiing, camping and hunting. When total expenditures, as given in Table 4.7, are applied to the per dollar expenditure ratios given in Table 4.14, estimates of expenditures by input-output sector are obtained.

Recreation Equipment Expenditures

Distribution of recreation equipment expenditures by input-output sector for recreationists using the camp recreational areas is given in Table 4.15. The method for classification of recreation equipment by input-output sector is prestated in the appendix. Over 56 cents of each dollar spent for recreation equipment is for other transportation equipment which is boats, boat trailers, camper trailers, motorcycles, etc. Motor vehicles and equipment account for about 28.6 cents of each recreation equipment dollar. In producers' value, about 26.4 cents of each recreation equipment dollar is for wholesale and retail trade services.

Similar input-output distribution data for recreation equipment expenditures by seasonal and permanent home owners is given in Table 4.16.

Table 4.14: Distribution of Seasonal and Permanent Recreation Home Owner Expenditures by Input-Output Sector, McClellan-Kerr Arkansas River Navigation System, 1974-75 Average

HERP Code	Sector Description	Seasonal Resident Expenditures per Dollar on Transportation, Food and Beverages and Utilities				Seasonal and Permanent Resident Expenditures per Dollar on Boating, Fishing Skiing, Camping, Hunting and Other			
		Purchasers' Value		Producers' Value		Purchasers' Value		Producers' Value	
		Total	Within Region	Total	Within Region	Total	Within Region	Total	Within Region
1	Livestock & Products	.01544	.01397	.01186	.01073				
2	Agricultural Crops	.02521	.02280	.01366	.01235				
3	Forestry & Fishery Prod.	.00410	.00371	.00172	.00156				
13	Ordinance & Access.					.05282	.03789	.02554	.01832
14	Food & Kindred Prods.	.45415	.41064	.28839	.26076				
17	Misc. Textile Goods					.00016	.00023	.00008	.00011
19	Misc. Fab. Textile Prod.	.00009	.00008	.00005	.00004				
20	Wood Products	.00288	.00310	.00180	.00194				
22	Household Furniture					.00264	.00244	.00156	.00144
27	Chemicals & Prods.	.00532	.00524	.00375	.00369				
29	Drugs & Cleaning Prods.	.00005	.00004	.00003	.00002				
31	Petroleum Ref. Prods.	.28244	.28482	.14702	.14826	.26764	.29658	.13932	.15438
32	Rubber & Plastic Prods.	.00173	.00152	.00098	.00086	.04458	.04775	.02521	.02701
38	Primary Nonferrous Metal					.00075	.00070	.00040	.00038
40	Heat., Plumb., & Fab. Metal					.00075	.00070	.00053	.00050
42	Other Fab. Metal Prods.	.00003	.00002	.00002	.00001				
54	Household Appliances					.00113	.00104	.00070	.00064
55	Electric & Wiring Equip.	.00003	.00003	.00002	.00002	.00113	.00104	.00078	.00072
58	Misc. Elect. Mach.	.00031	.00027	.00021	.00019				
59	Motor Vehicles & Equip.	.00018	.00016	.00015	.00013				
61	Other Transp. Equip.					.06635	.07269	.04569	.05005
64	Misc. Manuf.					.16592	.15655	.09658	.09112
65	Transp. & Warehousing	.00106	.00096	.03290	.03120	.05972	.06798	.07845	.08790
66	Communications	.01661	.02145	.01661	.02145				
68	Utilities	.12104	.15629	.12104	.15629				
69	Wholesale & Retail Trade	.01275	.01104	.30829	.29124	.11123	.12937	.35998	.38239
70	Finance & Insur.					.09753	.09813	.09753	.09813
71	Real Estate & Rental	.03131	.04044	.03131	.04044				
73	Business Services					.00260	.00117	.00260	.00117
75	Auto Repair Service	.00553	.00484	.00553	.00484				
76	Amusements					.06615	.02488	.06615	.02488
79	State & Local Gov't Enterp.	.00527	.00549	.00527	.00549				
80	Noncompetitive Imports	.01444	.01306	.00939	.00849				
83	Scrap Materials	.00003	.00003	*	*				
	State & Local Gov't					.05890	.06086	.05890	.06086
	Total	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

Table 4.15: Distribution of Recreation equipment Expenditures of On-Site Recreationists by Input-Output Sectors, McClellan-Kerr Arkansas River Navigation System, 1975

HERP Code	Sector Description	Total Expenditures				Expenditures Within Region			
		Purchasers' Value		Producers' Value		Purchasers' Value		Producers' Value	
		Total	Per Dollar	Total	Per Dollar	Total	Per Dollar	Total	Per Dollar
		($1,000)		($1,000)		($1,000)		($1,000)	
19	Misc. Fab. Textile Prod.	3,674	.0086	2,008	.0047	2,114	.0090	1,156	.0049
32	Rubber & Plastic Prods.	385	.0009	214	.0005	235	.0010	133	.0006
43	Engines & Turbines	57,423	.1344	39,521	.0925	33,706	.1435	23,190	.0987
59	Motor Vehicles & Equip.	122,195	.2860	99,123	.2320	68,163	.2902	55,299	.2354
61	Other Transp. Equip.	241,315	.5648	166,161	.3889	129,585	.5517	89,232	.3799
64	Misc. Manuf.	2,264	.0053	1,324	.0031	1,080	.0046	629	.0027
65	Transp. & Warehousing	---	--	6,024	.0141	---	--	3,330	.0142
69	Wholesale & Retail Trade	---	--	112,881	.2642	---	--	61,914	.2636
	Total	427,256	1.0000	427,256	1.0000	234,883	1.0000	234,883	1.0000

Table 4.16: Distribution of Seasonal and Permanent Home Owner Recreation Equipment Expenditures by Input-Output Sector, McClellan-Kerr Arkansas River Navigation System, 1974-75 Average

HERP Code	Sector Description	Seasonal Resident Expenditures Per Dollar				Permanent Resident Expenditures Per Dollar			
		Purchasers' Value		Producers' Value		Purchasers' Value		Producers' Value	
		Total	Within Region	Total	Within Region	Total	Within Region	Total	Within Region
19	Misc. Fab. Textile Prod.	.00095	--	.00052	--	.00340	.00297	.00186	.00162
20	Wood Products	.00057	--	.00036	--	.00870	.01115	.00544	.00697
28	Plastic Materials	.00057	--	.00041	--	.00870	.01115	.00621	.00796
32	Rubber Products	.00006	--	.00003	--	.00096	.00124	.00054	.00070
43	Engines & Turbines	.32534	.34322	.22383	.23614	.25620	.26171	.17627	.18006
59	Motor Vehicles & Equip.	.00713	--	.00578	--	.05787	.04807	.04695	.03900
61	Other Transp. Equip.	.65484	.64803	.45093	.44623	.65607	.65531	.45178	.45125
64	Misc. Manuf.	.01054	.00875	.00614	.00509	.00810	.00840	.00471	.00489
65	Transp. & Warehousing	--	--	.01036	.01019	--	--	.01172	.01180
69	Wholesale & Retail Trade	--	--	.30164	.30235	--	--	.29452	.29575
	Total	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

About 65 cents of each recreation equipment dollar is spent on other transportation equipment and 25 to 33 cents is spent on outboard and inboard motors. In producers' value about 30 cents of each recreation equipment expenditure dollar is spent on wholesale and retail trade services.

Current Account Recreation Expenditure Flows for 1975

Recreation expenditure data are summarized and presented in Table 4.17 as current account flows for 1975. This is how the data would be presented in an interregional input-output transactions table for 1975. The results are presented as current expenditures, both inside and outside the region, and as capital formation, inside and outside the region. Capital formation from the depreciation and construction of seasonal and permanent recreation homes has been excluded from the 1975 flow account.

Current Expenditure Account

Trip and annual expenditures are presented in columns one to four for (a) seasonal on-site recreationists; (b) off-season on-site recreationists; (c) seasonal home owners for tranpsortation, food and beverages, and utilities; and (d) seasonal and permanent home owners for boating, fishing, skiing, camping and hunting. On-site recreationist expenditure data as presented in Table 4.3 has been adjusted to exclude double counting of recreation home owner participation in U.S. Army Corps visitation data. To do this an estimate of the number of visitor days spent at Corps facilities by recreation home owners was made. From the 1975 survey data on recreation home owners had an estimated 175 days per year at Corps facilities. Distribution between seasonal (May thru September) and off-season was assumed equal to the distribution of the Corps visitation data between the two seasons. This adjustment reduced on-site recreationist current expenditures by $6,475,000 during the season and $1,914,000 during the off-season.

As indicated in Table 4.17, total current expenditures for 1975 is estimated at about $160 million within the region (column 5) and $59 million outside the region (column 10). On-site recreationists account for over 98 percent of total current expenditures. Current expenditures within the region are 73 percent of the total expenditures. Expenditures in Table 4.17 are presented in producers' value. Over $52 million or about 33 percent of the total expenditures within the region are accounted for in wholesale and retail trade services.

Capital Formation Account

Depreciation on recreation equipment and additions to recreation equipment inventory constitute the estimates of capital formation for current account 1975. Depreciation on on-site recreationists'

Table 4.17: Current Account Recreation Expenditure Flows for 1975 by Input-Output Sector, McClellan-Kerr Arkansas River Navigation System

($1,000 Producers' Value)

HERP Code	Sector Description	Current Expenditures Within Region					Current Expenditures Outside Region				
		On-Site Recreationists		Home Owners			On-Site Recreationists		Home Owners		
		Recreation Season (1)	Off-Season (2)	Seasonal (3)	Permanent & Seasonal (4)	Total (5)	Recreation Season (6)	Off-Season (7)	Seasonal (8)	Permanent & Seasonal (9)	Total (10)
1	Livestock & Products	976	285	12	—	1,273	294	86	5	—	385
2	Agricultural Crops	1,122	328	14	—	1,464	332	97	6	—	435
3	Forestry & Fishery Prod.	146	43	2	—	191	38	11	1	—	50
13	Ordinance & Access.	—	—	—	19	19	—	—	—	18	18
14	Food & Kindred Prods.	25,162	7,351	297	—	32,810	7,150	2,089	126	—	9,365
17	Misc. Textile Goods	134	39	—	*	173	133	39	—	—	172
19	Misc. Tab. Textile Prod.	—	—	*	—	*	—	—	—	—	—
20	Wood Products	—	—	2	—	2	—	—	1	—	1
22	Household Furniture	1,012	296	—	1	1,309	625	182	—	1	808
27	Chemicals & Prods.	366	107	4	—	477	85	25	2	—	112
28	Plastic Materials	—	—	—	—	—	—	—	—	—	—
29	Drugs & Cleaning	763	232	*	—	1,025	260	76	—	—	336
31	Petroleum Ref. Prods.	15,941	4,657	169	156	20,923	4,426	1,293	47	49	5,815
32	Rubber & Plastic Prods.	1,378	403	1	27	1,809	761	222		10	993
38	Primary Nonferrous Metal	268	78	—	*	346	166	49	—	1	216
40	Heat., Plumb., & Fab. Metal	524	153	—	1	678	328	96	—	—	424
42	Other Fab. Metal Prods.	390	114	*	—	504	128	37	—	—	165
43	Engines & Turbines	—	—	—	—	—	—	—	—	—	—
54	Household Appliances	451	132	—	1	584	284	83	—	—	367
55	Electric & Wiring Equip.	512	150	*	1	663	307	89	—	—	396
58	Misc. Elect. Mach.	—	—	*	—	*	17	5	—	—	22
59	Motor Vehicles & Equip.	—	—	*	—	*	17	5	—	—	22
61	Other Transp. Equip.	2,317	677	—	51	3,045	974	285	—	16	1,275
64	Misc. Manuf.	4,318	1,261	—	92	5,671	2,916	853	—	50	3,819
65	Transp. & Warehousing	5,586	1,632	36	89	7,343	1,314	384	12	26	1,736
66	Communications	—	—	24	—	24	—	—	—	—	—
68	Utilities	—	—	178	—	178	—	—	—	—	—
69	Wholesale & Retail Trade	39,860	11,645	331	386	52,222	14,056	4,107	122	143	18,428
70	Finance & Insur.	9,599	2,804	—	99	12,502	6,541	1,911	—	44	8,496
71	Real Estate & Rental	—	—	46	—	46	—	—	—	—	—
72	Hotels & Lodging	817	239	—	—	1,056	887	259	—	—	1,146
73	Business Services	1,146	335	—	1	1,482	775	226	—	3	1,004
75	Auto Repair Service	281	82	6	—	369	320	92	2	—	414
76	Amusements	646	189	—	25	860	56	16	—	72	144
77	Medical & Educ. Serv.	—	—	—	—	—	17	5	—	—	22
79	State & Local Gov't Enterp.	256	75	6	—	337	78	23	2	—	103
80	Noncompetitive Imports	768	224	10	—	1,002	234	69	4	—	307
	State & Local Gov't	2,561	748	—	62	3,371	1,532	448	—	24	2,004
	Federal Gov't	4,635	1,354	—	—	5,989	60	18	—	—	78
	Total	121,965	35,633	1,138	1,011	159,747	45,111	13,180	330	457	59,078

Table 4.17: Continued.

HERP Code	Capital Formation Within Region: Depreciation of On-Site Recreationists Equipment (11)	Additions to On-Site Recreationists Equipment (12)	Depreciation of Home Owners Recreation Equip.: Seasonal (13)	Depreciation of Home Owners Recreation Equip.: Permanent (14)	Total (15)	Capital Formation Outside Region: Depreciation of On-Site Recreationists Equipment (16)	Additions to On-Site Recreationists Equipment (17)	Depreciation of Home Owners Recreation Equip.: Seasonal (18)	Depreciation of Home Owners Recreation Equip.: Permanent (19)	Total (20)	Total Within Region (21)	Total Outside Region (22)
1	—	—	—	—	—	—	—	—	—	—	1,273	385
2	—	—	—	—	—	—	—	—	—	—	1,464	435
3	—	—	—	—	—	—	—	—	—	—	191	50
13	—	—	—	—	—	—	—	—	—	—	19	18
14	—	—	—	—	—	—	—	—	—	—	32,810	9,365
17	—	—	—	—	—	—	—	—	—	—	173	172
19	111	68	—	1	180	82	51	—	—	133	180	133
20	—	—	—	4	4	—	—	—	—	—	6	1
22	—	—	—	—	—	—	—	—	—	—	1,309	808
27	—	—	—	—	—	—	—	—	—	—	477	112
28	—	—	—	5	5	—	—	—	—	—	5	
29	—	—	—	—	—	—	—	—	—	—	1,025	336
31	—	—	—	—	—	—	—	—	—	—	20,923	5,815
32	14	8	—	*	22	7	5	—	—	12	1,831	1,005
38	—	—	—	—	—	—	—	—	—	—	346	216
40	—	—	—	—	—	—	—	—	—	—	678	424
42	—	—	—	—	—	—	—	—	—	—	504	165
43	2,233	1,371	41	111	3,756	1,572	966	40	28	2,606	3,756	2,606
54	—	—	—	—	—	—	—	—	—	—	584	367
55	—	—	—	—	—	—	—	—	—	—	663	396
58	—	—	—	—	—	—	—	—	—	—	*	22
59	5,326	3,271	—	24	8,621	4,218	2,590	2	13	6,823	8,621	6,845
51	8,596	5,279	77	277	14,229	7,403	4,546	88	79	12,116	17,274	13,391
64	61	38	1	3	103	67	40	1	1	109	5,774	3,928
65	321	197	2	7	527	259	159	2	2	422	7,860	2,158
66	—	—	—	—	—	—	—	—	—	—	24	—
68	—	—	—	—	—	—	—	—	—	—	178	—
69	5,964	3,663	52	182	9,861	4,905	3,011	57	50	8,023	62,083	26,451
70	—	—	—	—	—	—	—	—	—	—	12,502	8,496
71	—	—	—	—	—	—	—	—	—	—	46	—
72	—	—	—	—	—	—	—	—	—	—	1,056	1,146
73	—	—	—	—	—	—	—	—	—	—	1,482	1,004
75	—	—	—	—	—	—	—	—	—	—	369	414
76	—	—	—	—	—	—	—	—	—	—	860	144
77	—	—	—	—	—	—	—	—	—	—	—	22
79	—	—	—	—	—	—	—	—	—	—	337	103
80	—	—	—	—	—	—	—	—	—	—	1,002	307
											3,371	2,004
											5,98[9]	78
Total	22,626	13,895	173	614	37,308	18,513	11,368	190	173	30,244	197,055	89,322

equipment is computed using a 10 percent depreciation rate and the value of equipment as given in Table 4.9 but adjusted for visitor days accounted for by occupants of recreation homes.

The increase in visitor days for 1975 over 1974 means an increase in recreation equipment inventory and subsequently an addition to capital formation. The increase in visitor days is 1,613,200 and at $15.66 equipment value per visitor day is equal to about $13.9 million expenditures for capital formation within the region and $11.3 million expenditures outside the region.

Total estimated expenditures for capital formation within the region was about $37.3 million in 1975 and $30.2 million outside the region. Total expenditures for 1975 for capital formation accounted for about 19 percent of total current account recreation expenditures within the region and 34 percent outside the region (Table 4.17).

Data were not available to compute capital formation from additions to stock of recreation homes. Neither was an estimate made on depreciation of recreation homes and a subsequent distribution to input-output sectors.

An estimate of total direct recreation impact for the Arkansas River navigation region in 1975 is given in columns (21) and (22) of Table 4.17. Estimated expenditures within the region is about $197 million and outside the region is $89 million for a total of $256 million.

POLICY IMPLICATIONS IN RECREATION MANAGEMENT

Future Developments and Environmental Considerations

The aggregate data presented in this report indicate that water and related land based recreation in the system has a significant impact on the local economies as well as generating expenditure impacts in Oklahoma City, Tulsa, Ft. Smith, and Little Rock, and other places of residence of the recreationists. Additional facilities and access roads need to be developed for the recreational are as around the lakes and locks and dams. Continued increases in visitations at some of the lakes in the system cannot be maintained much longer without adversely affecting the local areas. Traffic congestion, overuse of the existing facilities, erosion of the soil and destruction of the vegetation are sources of the problems. However, in the short run, increases in visitations do create increased income and increased employment in the local area.

The environmental integrity of the recreational areas around the lakes is being threatened as insufficient facilties exist to accommodate the increasing recreation use in peak summer months. Several "overflow" areas have been designated to handle the crowds on peak use weekends. A serious problem is the lack of proper facilities to accommodate the increasing number of camping type vehicles. More concrete pads and electrical hookups at the campsites are needed, as are additional water hookups and sanitary dump stations. Open pit toilets and the absence of shower facilities are also objectionable to many of the recreationists.

Visual Pollution

New housing developments on bare hills and cliffs, with no attempt to "blend in" with the vegetation and trees creates ugly scars and eyesores around many of our lakes. Similarly, family located mobile home or trailer parks in conjunction with marina concession leases at Corps lakes leave physical scars and clutter up the recreation area. The haphazard location of many beer, bait, and tackle shops, and dilapidated motels on the access roads to many of our lakes also leave much to be desired. Proper land use planning and zoning by local units of government would help solve this problem.

Similarly, the improper disposal of solid waste is another problem which blights our scenic areas. Development of sanitary landfills and enforcement of anti-litter laws are necessary steps to cleaning up the roadsides and woods around our recreational developments.

Parking of cars and trucks on beaches, and creating new trails, leading to gullies and erosion are other visual pollution problems. Too many recreationists vie for the "best" location, want to be right on the beach, hate to walk, etc., and don't really think about the rights of others to enjoy the natural beauty of an area. Zoning of areas in the recreational complex, designation of parking areas, and use of natural

barriers (multiflora rose, trees, shrubs), or artificial barriers (posts, telephone poles, rocks) are needed to control non-thinking or self-interest recreationists.

Physical Degradation of Environment

Recreationists in general appear to have a herd instinct. They also believe in the Mob Psychology Principle--if one group of recreationists finds a good place to camp or picnic, others soon follow their lead. Thus, we have problems of overconcentration of recreationists in one area, and too few recreationists in other areas. Results are inability to maintain the area physically (keep rest rooms clean and trash barrels empty), and destruction of the vegetation and undergrowth, compaction of the soil and subsequent erosion.

This herd instinct can be overcome with proper planning and design of recreational areas, rotation of the heavily used areas, including blocking or fencing off these areas for rest, restoration, and revegetation. Use of a scaled or mixed pricing system or some other rationing system to physically "spread out" the recreationists are other alternatives which need to be explored more fully. Research is needed in this area.

The rapid buildup of both seasonal and permanent homes, trailer courts, and the heavy concentration of on-site recreationists in the summer months also lead to sewage problems and how to handle the liquid sewage wastes. Inadequate inspections by county sanitarians, improper construction of septic tanks and sewage lagoons, and lack of concern by home owners have resulted in seepage, and runoff problems of raw and improperly treated sewage into our lakes. Proper enforcement of health regulations and increased use of zoning to prevent overdevelopment of an area and supersaturation of the soil are the keys to prevention of these sewage problems. Soil analyses and use of common sense in location of the drainage fields or sewage lagoons are urgently needed also.

Noise Pollution

The increasing use of motorcycles, minibikes, trailbikes, dune buggies, and various types of off-the-road vehicles have compounded the problems of recreational managers. A general complaint by campers and others has been the boat motor noises and related traffic noises of early morning skiers, fishermen, or boaters. Now the cry is for relief from the piercing shreiks of the two-wheel and four-wheel trail riders who like the loud sound of power under their seats. Lack of concern for the rights of others has lead to much of this problem. The typical comment of a trail bike rider around our lakes is: "I have as much right to do my thing as the camper or water skier." However, quiet zones do need to be established, areas set aside just for these off-road and trail type vehicles, and "quiet times" or early evening and night time hours established, when use of any land vehicle or piece of recreational equipment is prohibited. Rangers and/or other lake or park personnel must enforce these ordinances or regulations.

Vandalism

Some recreationists do not consider vandalism as a pollution or environmental quality problem of major importance. Destruction of restroom and picnic facilities, spray paint scrawls, chopping down of trees, backing or driving off the designated parking areas and destroying vegetation, and just plain carelessness in use of camp fires and discarding of cigarettes and matches, all result in physical destruction and visual blight. Repair of vandalism generally is very costly. Theft of recreational equipment is also a major problem. This is again part of the vandalism story, which creates problems for recreation managers, and which creates losses of satisfaction and lower quality recreational experience for other recreationists.

Improved supervision, daily inspection and immediate repair of small damages are deterrents to continued vandalism. It is a fact that immediate clean-up or deletion of crayon or paint "ditties" on restroom walls and picnic shelters stops the impetus or stimulus for others to write their names or ditties for posterity.

Increased use of law enforcement agencies, and prosecution of a few cases when the vandal can be traced or caught, would do much to reduce such damages. Nothing is really vandal-proof. However, better planning on location of facilities so they can be observed or supervised, and use of steel and concrete for more facility construction, would help reduce vandalism.

Flood Control Projects and Environmental Problems

The multiple purpose mix of flood control and recreation on many of our federal water resource development projects does result in some environmental problems. Temporary loss of picnicing and camping facilities due to flood waters, and physical erosion of top soil and loss of beaches are some of the problems. Losses of trees due to baring of roots, as well as being covered with water for extended periods of time also cause losses in environmental quality, i. e., scenic beauty of the area, as well as limiting the usefulness of the area for future recreational activities.

Obviously, some of these problems can be overcome with adequate infusions of money, trucks, labor, top soil, and proper "love and care". Public agencies managing multiple purpose water resource development projects should request larger operation and maintenance budgets for recovery and refurbishing of an area after the flood waters recede. Lack of an adequate budget to clean up and revitalize the lake shoreline and recreational facilities is a most serious problem. Unfortunately, such inadequate funding has led to permanent loss of trees, and loss of space and facilities around our lakes, adversely impacting on future recreational opportunities.

Suggestions for Extending the Seasonal Period of Recreation Use

Marina concession operators, Corps of Engineer Lake Rangers and other Corps personnel, State Parks personnel, on-site recreationists, and seasonal and permanent homeowners living around the lake were requested to make suggestions concerning how to even out the very intensive seasonal peaks of recreational activity at the lake. In other words, what could be done to encourage the recreationists utilizing our lakes to visit the lake more often in the spring, fall, and winter months, possible trading some of these visits for current summer trips to the lake. Consensus comments are discussed below in three categories; natural environment; man-made or physical facilities; and, economic incentives.

Natural Environment

Efforts should be intensified to increase plantings of flowering shrubs and flowering trees that have both spring colors and add variety to the fall foliage. Also a greater variety of deciduous trees should be planted.

Plantings of evergreens (different types of pines and cedars) should be increased in the public use areas, particularly intensifying such plantings to screen and separate the different recreational activities. Evergreens add "life and color" to the otherwise drab appearance of the deciduous trees during the winter months. Evergreens have a lower profile and do a better job of absorbing sounds (noises), as well as physically screening areas, such as campsites.

Revegetate existing eroded areas and block off some of these areas from use until the vegetation has been reestablished.

Increase efforts to replace top soil around bare tree roots and around the shoreline, and to reestablish grassed areas, after flood waters recede. This will preent loss of trees, as well as prevent rilling and erosion of additional soil into the lake with rainfall runoff.

Man-Made or Physical Facilities

Improve existing restroom facilities, and locate more restrooms in more natural isolated geographic settings around the lake where only one use is permitted in that area. Recreationists indicated they would utilize these areas more (to spread out the crowds) during the "tourist" season, if available, but would also like these types of areas during the off-season, for camping, hiking, and nature trail walks, where they would be away from boat trailers, cars, and congestion.

Build facilities for winter time use at a few of the public use areas. Examples given by the recreationists were indoor swimming pools, or outdoor heated pools with screening for wind breaks, possibly in conjunction with the State Park cabins, or in well developed campsite areas;

sauna and steam baths; artificially freeze ice on some shallow pond areas or in a building, for ice skating; make artificial snow and have a small snow ski run.

Build some arts and crafts centers, and/or exposition halls (large open buildings) for arts and crafts exhibitions and expositions, as well as for country and western dances.

Economic and Related Incentives

Marina operators, State Parks policy makers, Corps of Engineers planners, and local business operators could offer discount rates for use of boats, facilities, etc., in the fall and winter months. It is recognized by the authors that the Corps of Engineers does not charge a user fee for camping during off-season. Also, the State Parks do offer a discount on the cabins from September 15 through April 15.

Advertise in papers and on TV the beauty of the areas in the Fall, Winter, and early Spring months.

Cooperate with travel agencies and bus companies to promote more intensively the Fall and Spring foliage tours, and to include some of the recreation areas and State Parks around the lakes in the tour itinerary.

Encourage plants and factories in large cities (e.g. Oklahoma City, Tulsa, and Fort Smith) to cooperate in sponsoring off-season family weekends at the recreation areas around the lake. Bring in name entertainers, recreation big name specialists (e.g. Ted Williams and Sears camping and fishing tie-in) and have both outdoor and indoor dances, and demonstrations. Teach how to tie flies, how to cast, how to cook camping style, etc.

Cooperate with boat manufacturers, fishing tackle and equipment companies, tent, camper and motor home manufacturers to sponsor off-season (April or October) exhibits, demonstrations, etc. with "big-draw" names (see above) to encourage off season visits to the lake.

Sponsor fall, winter, and spring festivals at the lake, similar to the successful Sand Bass Festival at Lake Texoma.

Cater more to older people and retired people. They can travel in off-season. Also use them as resource people to help put on demonstrations on crafts, skills, camping, etc. Several groups of older people suggested this! They want to feel needed and a part of society.

Charge user fees for more activities than just camping, and then charge a lower rate or have no fee in off-season.

Charge user fees on Thursdays and weekends, but not during the early part of the week (Monday-Wednesday) when many of the facilities in the public use areas are virtually abandoned, even during the peak summer season months.

Orient advertising in fall and winter months to people in those businesses who may have some slack or free time and want to take a vacation; e.g. farmers, certain types of motel and restaurant and summer sports related businesses, who could allow their employees to take off a week during the off season.

Some Final Comments on the Pros and Cons of Increasing Recreational Use

Many recent research studies have documented favorable economic impacts and have indicated gains in the esthetic experiences of millions of people as a result of recreational activities generated on and around man-made lakes. This multipurpose aspect of reservoirs is a topic unto itself and its implications cannot be explored in detail here.

We wish only to indicate here that changes have taken place in nearby local communities as a result of recreational developments on man-made lakes, and that some of these changes have environmental related effects. Some results have been increased traffic and movement of people into the rural areas around the reservoirs [5]. Also such recreational developments affect economic development through the multiplier effect and change the life style of certain groups [4].

The pollution of lakes by septic tanks built too close to the lake and/or improperly built are indirect effects of man-made reservoirs. Inadequate zoning ordinances and restrictions around reservoirs have allowed these situations to develop. The Corps of Engineers should insist that the local governments establish more stringent requirements to protect the environmental and esthetic qualities of the completed reservoirs. The transference of a tranquil rural setting into a bustling, viable growth center because of the availability of water for multiple purposes from a man-made reservoir creates both favorable and adverse environmental effects [6, pp. 13-17].

Providing recreational experiences on and around man-made reservoirs results in net gains for our environmental life style. However, we have become entangled on the "horns of a dilemma". The more industrialized our nation becomes, the higher our GNP and the more affluent we have become as individuals. This affluence is reflected in our recreation habits! Two cars per family, camping trailers and other recreational vehicles, vacation homes on lakes, etc., all have led to higher levels of solid and liquid wastes to be disposed of, as well as more air and water pollution from our leisure time activities (gasoline and oil in water, dumping garbage and sewage overboard from boats and docks, etc.).

Zoning of both the reservoir and surrounding land becomes very important in efforts to obtain as many beneficial externalities as possible from the construction of man-made lakes. Zoning protects physical property, assures good vistas without obstructions, and results in complementary recreational, working, and living activities on and around the water complex. Without the proper zoning, the primary land use change

may be to low quality seasonal housing and commercial enterprises. "These developments may deteriorate the natural surroundings, lowering property values of others" [7, p. 122].

Recommendations for the Future

Certainly, the manufacturing and industrial developments which have taken place around and near some of our man-made reservoirs have changed the entire environment and life style of the adjacent geographic areas. The quality of water in the lakes has been affected in many cases by these developments. Subdivisions, growth of towns, and interstate highways, etc. result in many previously rural settings being disturbed. How we balance the gains and losses of the externalities involved in these changes is a research area in which we are woefully void of results.

The need for additional and improved recreational facilities becomes more apparent as several trends can be noted that suggest an intensification of the level of recreational use of our lakes. On the national level, the trend toward a four day work week essentially will make every weekend a three day weekend, providing more time for traveling. Increased levels of education tend to increase one's demand for outdoor recreation. Increased levels of income will provide more people with the financial means needed to recreate away from home. Reduced family size reduces the number of potential family conflicts, allowing more "non-committed" weekends for the family. In addition, smaller families should suggest higher levels of discretionary income which can be spent on other things.

On the regional level, industrialization along the McClellan-Kerr Arkansas River Navigation System will attract new people and create new jobs, increasing both the local population base and income level, thereby increasing the number of potential recreationists. Improved highways will lead to increased participation and will lead to still further increases as more people become aware of the increased recreational opportunities available to them within a few hours driving time. The population of nearby metropolitan areas continues to increase, resulting in even greater recreation pressures on these lakes. Establishment of rural water districts has enhanced the development of subdivisions around many of the lakes. These subdivisions are made up largely of permanent homes for retired couples as well as second homes for people living considerable distances from the lake.

Maintenance of the environmental integrity of both the water and surrounding land recreation areas at these lakes and locks and dams must be emphasized. Overuse and abuse may eventually reduce the quality and value of the recreation experience if proper management and sufficient operational and maintenance funds are not provided. If that happens, then the future beneficial impacts of water and related land based recreation on both local and regional economies will be much smaller than now envisioned.

Fortunately, we have the resources to offset or counteract some of the environmental problems we are causing on and around our man-made lakes. However, the Corps of Engineers, as well as State Parks agencies, must include in their budget requests the monies needed for operation and maintenance, as well as for continued improvement of these recreational developments to insure that the environmental integrity of the surrounding areas is protected.

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APPENDIX A

THE SAMPLING DESIGN PROCESS FOR 1974 AND 1975

1974 Sample Procedure

The sample size for 1974 was set at 1,000 interviews which had to be obtained over a two month period due to a late start in getting the project off the ground. The number of interviews taken at each lake or lock and dam was determined by the number of reported visitor days and a predetermined expenditure weight for each activity. The expenditure weights (in reality, an estimate of expenditures per visitor day where that activity was the major activity during the day) were based on results from previous studies and from generally accepted values developed over time in implementing the 1964 Supplement number to Senate Document No. 97. For example, due to lack of specific values for picnicking, swimming, and sightseeing the $1.50 per visitor day suggested as a value in that supplement was used.

Activity	Expenditure Weights
Camping	7.50
Picnicking	1.50
Boating	5.00
Fishing	5.60
Hunting	4.95
Sightseeing	1.50
Skiing	5.00
Swimming	1.50

Statisticians at Oklahoma State University used these expenditure weights multiplied by the number of represented activity days for each recreation area during the two month period July-August 1973. Attendance for these two months were used since these were the months interviews would be made with on site recreationists in 1974. The purpose of the weighting was to develop a sample that would reflect the economic importance of the different types of activities engaged in. Since the objective of the study was to determine the economic impact of recreation expenditures, it was felt such a weighting process would provide a move accurate method to aggregate the sample data to the population or total irritations at the various lake and lock and dam projects.

The statisticians developed a weighted sample which appears in column four of Appendix Table 1. To minimize costs of interviewing we determined that the sample size at any lake or lock and dam had to be large enough to keep two interviewers busy for a full day. We had anticipated each interviewer could obtain 10 interviews per day. Hence, the weighted sample as determined in column four of Appendix Table 1 was adjusted to give us the results in column five. The actual recreational areas for a lake or lock and dam in which interviewing took place were randomly drawn with probabilities weighted by number of visitor days reported for that recreational area in 1973.

The actual number of interviews obtained in 1974 is given in the next to last column of Appendix 1. For informational purposes, the last column presents the actual number of visitor days accounted for by the interviews as computed from the questionnaires. The 17,975 visitor days represented by the interviews is about one-fourth of one percent of the total number of visitor days reported for July and August of 1973.

A number of insights were gained during the 1974 interview process that facilitated the 1975 interviewing process. It also provided the incentive to reorganize the sampling procedure for 1975.

1975 Sample Procedure

We found that the interviewer mobility problem between recreational areas was less restrictive than at first anticipated in the 1974 interview process. We also had the entire recreation season for interviewing in 1975 versus only two months in 1974. We therefore determined to visit each lake or area in three different time periods during the season in Oklahoma and in two different time periods in Arkansas.

Results of the 1974 interviews indicated that expenditures per visitor day by the different major activity groups did not vary substantially from each other and were much higher for selected activities, such as swimming and picnicking then we expected. Those results are presented in Chapter IV of this report. Thus, in the 1975 sample design, weighting by major activity days was dropped and the emphasis placed only on random selection of recreation areas in which to interview. The recreational areas again were randomly drawn with probabilities weighted by number of visitor days reported in 1974.

The overall sample size again was set at about 1,000 interviews. Emphasis for 1975 was to have a large enough sample at each lake or area to provide a statistically valid estimate of the expenditure per visitor day statistic. For this reason, it was determined to sample about twice as heavy in Arkansas in 1975 as we did in 1974, and also to increase interviews at Oologah and Keystone. Therefore, the 1000 interviews were not distributed to lakes or areas exactly in proportion to visitor days recorded in 1974. The final distribution of interviews by lake and area for both years is indicated in Table 1.1.

APPENDIX TABLE 1

Visitation Data Used for Expenditure Survey Sample Design for the McClellan-Kerr Arkansas River System, 1974

Lake or Lock and Dam	Annual Visitor Days 1973	Number of Recreation Areas	Visitor Days July-Aug. 1973	Weighted Sample of 1,000 Interviews		Actual Number of Interviews 1974	Interview Visitor Days 1974
				Actual	Adjusted		
L & D #1	54,274	3	9,277	1	0	0	
L & D #2	547,299	10	148,379	12	20	14	
L & D #3	190,027	5	41,122	4	0	17	
L & D #4	688,608	4	174,690	16	20	0	343
L & D #5	342,673	5	73,402	7	0	2	
David D. Terry	638,905	5	154,538	10	20	20	
Murray	387,216	2	12,332	1	0	0	
Toadsuck Ferry	71,038	2	15,970	1	0	0	
L & D #9	150,753	2	26,419	1	0	0	
Dardanelle	2,128,364	21	454,586	65	60	96	1,302
Ozark	490,882	9	96,815	11	20	4	
L & D #13	184,391	2	44,073	4	0	0	
Arkansas	5,874,430	70	1,251,603	133	140	153	1,645
W. D. Mayo	120,200	3	36,500	3	0	0	
Robert S. Kerr	680,700	12	186,500	20	20	20	
Webbers Falls	218,600	5	41,000	5	5	6	308
Chouteau (L & D #17)	91,900	6	4,200	0	0	0	
Newt Graham (L & D #18)	60,200	4	13,500	1	0	0	
Tenkiller	4,055,300	19	1,394,000	328	320	310	7,631
Oologah	1,325,700	7	347,400	61	60	61	917
Keystone	3,138,400	21	971,400	81	80	82	1,075
Ft. Gibson	4,008,300	28	1,096,000	234	240	237	3,725
Eufaula	4,521,900	30	1,366,400	133	140	140	2,674
Oklahoma	18,221,200	135	5,456,900	866	865	856	16,330
Total	24,095,630	205	6,708,503	999	1,005	1,009	17,975

Source: Visitation data obtained from Tulsa and Little Rock Districts U.S. Army Corps of Engineers.

APPENDIX TABLE 2

Table 2.5: Fishing Activity Days, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in 1,000)

	Keystone		Fort Gibson		Eufaula		Tenkiller		Oologah		Oklahoma Main Channel		Arkansas Above Little Rock		Arkansas Below Little Rock		Monthly Total	
	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975
January	24.3	24.4	68.7	116.7	24.8	26.8	60.7	121.6	14.9	38.4	13.0	20.0	49.8	99.7	24.1	30.6	280.3	478.2
February	26.0	25.7	109.1	76.8	47.3	21.9	70.8	154.6	30.2	11.4	16.1	16.6	101.8	75.0	44.3	35.6	445.6	417.6
March	58.9	43.5	230.9	134.6	87.9	63.2	113.9	178.8	67.8	20.8	24.2	29.6	186.7	133.1	53.7	41.4	824.0	645.0
April	74.2	75.7	291.3	211.0	122.7	93.0	194.5	349.5	60.7	46.5	31.1	51.6	139.4	232.0	64.3	91.2	978.2	1150.5
May	72.2	72.5	328.6	255.7	126.7	168.2	345.4	399.9	162.7	51.6	44.0	50.9	169.9	172.6	85.0	146.6	1334.5	1318.0
June	51.9	38.7	376.0	284.4	179.3	228.7	329.8	486.3	108.1	73.1	49.3	43.1	147.0	212.1	102.6	74.6	1344.0	1441.0
July	62.5	47.3	460.2	606.9	188.4	187.5	526.1	591.4	94.4	31.6	43.4	50.5	179.5	227.7	64.1	102.8	1618.6	1845.7
August	91.6	48.0	313.1	249.5	146.0	178.4	385.7	337.0	77.6	51.8	37.2	71.0	225.3	240.2	114.0	69.6	1390.5	1245.5
September	48.1	112.0	277.4	107.5	94.8	108.7	116.1	118.7	64.1	2.5	31.7	66.2	176.5	162.5	51.6	39.9	860.3	718.0
October	38.8	68.2	234.5	92.4	81.4	89.7	138.6	76.1	43.8	21.0	40.2	53.8	171.5	163.1	45.0	34.8	793.8	599.1
November	32.2	39.1	303.7	177.1	62.0	65.9	171.2	84.2	24.4	7.3	27.8	35.3	99.1	114.2	27.6	48.4	748.0	571.5
December	2.6	21.9	15.1	59.1	13.4	18.5	10.7	29.8	.8	3.7	8.3	18.7	81.9	105.0	20.3	48.4	153.1	305.1
Total	583.3	617.0	3008.6	2371.7	1174.7	1250.5	2463.5	2927.9	749.5	359.7	366.3	507.3	1728.4	1937.2	696.6	763.9	10770.9	10735.2

Source: Data obtained from Tulsa and Little Rock Districts, U.S. Army Corps of Engineers.

APPENDIX TABLE 3

Table 2.6: Sightseeing Activity Days, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in 1,000)

Month	Keystone		Fort Gibson		Eufaula		Tenkiller		Oologah		Oklahoma Main Channel		Arkansas Above Little Rock		Arkansas Below Little Rock		Monthly Total	
	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975
January	42.7	43.7	23.8	15.8	143.4	109.3	67.6	16.7	17.7	42.8	16.9	22.8	64.3	92.9	31.1	46.1	407.5	390.2
February	46.8	44.8	36.8	9.9	171.9	89.7	72.1	20.2	39.7	7.4	23.1	15.5	145.7	73.2	74.8	52.8	610.9	313.5
March	97.2	76.5	77.8	18.0	290.5	157.5	120.9	25.4	83.5	26.0	39.4	29.1	171.2	97.2	62.4	80.0	942.9	509.7
April	121.5	133.5	39.0	28.3	222.5	181.2	195.0	57.9	75.5	44.9	41.1	43.4	156.2	154.9	70.5	137.6	921.3	781.7
May	122.9	140.6	43.3	52.8	216.6	259.2	361.4	169.2	194.4	109.2	65.7	62.1	153.3	235.8	111.4	134.8	1269.0	1164.0
June	134.9	85.1	51.0	59.6	322.6	458.0	339.3	222.7	136.7	82.7	96.3	65.8	131.8	256.5	140.6	100.6	1353.2	1331.0
July	159.8	116.2	61.4	125.5	309.8	332.0	545.5	275.0	126.3	76.5	58.8	66.6	146.4	220.9	86.2	128.3	1494.2	1341.0
August	187.2	94.8	40.0	52.0	232.0	307.9	411.2	139.8	100.0	105.4	48.3	102.3	165.5	233.0	143.0	107.5	1327.2	1142.7
September	83.8	5.0	37.2	31.2	140.4	146.8	142.3	51.3	68.8	5.0	39.6	76.3	121.6	162.1	56.0	58.2	689.7	535.9
October	58.3	84.5	29.8	36.4	146.8	164.5	181.0	78.5	45.4	47.0	34.3	70.9	168.2	149.2	67.3	64.2	731.1	695.2
November	58.9	56.6	42.0	68.9	129.6	133.1	2.3	88.0	28.1	21.2	21.1	54.4	78.4	103.8	39.4	69.1	399.8	595.1
December	45.5	30.4	15.8	22.8	109.8	65.5	11.7	31.7	9.8	5.4	11.7	24.1	102.2	113.3	32.5	69.1	339.0	362.3
Total	1159.5	911.9	497.9	521.2	2435.9	2404.7	2450.3	1176.4	925.9	573.5	496.3	633.3	1604.8	1892.8	915.2	1048.3	10485.8	9162.3

Source: Data obtained from Tulsa and Little Rock Districts, U.S. Army Corps of Engineers.

APPENDIX TABLE 4

Table 2.7: Camping Activity Days, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in 1,000)

	Keystone		Fort Gibson		Eufaula		Tenkiller		Oologah		Oklahoma Main Channel		Arkansas Above Little Rock		Arkansas Below Little Rock		Monthly Total	
	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975
January	1.1	1.1	11.3	21.8	00.0	00.0	36.5	22.8	0.6	1.8	1.2	3.2	7.9	6.6	0.2	0.1	58.8	57.4
February	1.4	1.1	18.1	14.3	1.4	0.6	42.5	28.9	1.4	0.3	2.5	0.8	13.8	7.7	0.5	0.1	80.2	53.8
March	2.3	2.0	38.4	25.0	5.9	3.9	68.5	33.5	4.7	1.0	4.2	5.7	27.2	13.8	0.6	0.2	151.8	85.1
April	4.1	3.8	109.0	39.5	11.4	8.6	116.8	65.5	5.8	2.3	5.2	9.0	26.7	27.4	0.7	0.7	279.7	156.8
May	28.2	28.2	122.9	154.0	24.9	30.3	276.3	306.5	18.8	3.5	11.3	13.4	35.9	41.5	3.8	3.6	522.1	581.0
June	46.2	27.5	141.1	170.2	25.0	31.7	263.7	441.7	14.4	5.4	15.6	11.4	28.5	53.0	5.7	2.1	540.2	743.0
July	55.5	48.8	172.6	365.2	34.3	33.9	420.8	529.8	12.6	3.8	12.4	18.3	35.0	48.8	2.3	2.9	745.5	1051.5
August	48.3	36.9	117.4	149.8	17.5	21.5	309.0	313.5	10.4	4.6	10.4	14.5	29.1	39.2	3.5	2.3	545.6	582.3
September	18.3	4.8	51.8	60.0	8.3	9.8	69.8	111.4	7.1	0.2	6.0	7.2	17.2	20.5	2.3	1.1	180.8	215.0
October	8.8	3.6	43.8	5.8	3.5	4.9	83.2	13.9	4.0	1.6	4.2	4.9	30.7	14.9	0.3	0.4	178.5	50.0
November	1.8	1.9	56.9	11.0	1.2	1.6	32.1	15.4	5.4	0.2	5.0	2.0	9.6	12.2	0.2	0.4	112.2	44.7
December	0.6	1.0	22.5	3.2	0.8	0.5	15.8	5.3	0.5	0.0	1.5	0.5	18.4	9.7	0.1	0.4	60.2	20.6
Total	216.6	160.7	905.8	1019.8	134.2	147.3	1735.0	1888.2	85.7	24.7	79.5	90.9	280.0	295.3	20.2	14.3	3455.6	3641.2

Source: Data obtained from Tulsa and Little Rock Districts, U.S. Army Corps of Engineers.

APPENDIX TABLE 5

Table 2.8: Picnicking Activity Days, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in 1,000)

	Keystone		Fort Gibson		Eufaula		Tenkiller		Oolagah		Oklahoma Main Channel		Arkansas Above Little Rock		Arkansas Below Little Rock		Monthly Total	
	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975
January	5.2	4.5	16.9	21.8	7.0	3.6	19.6	22.8	.6	4.4	.9	3.0	3.3	10.5	.4	.1	53.9	70.7
February	5.7	4.8	27.2	14.3	9.9	2.8	21.5	28.9	1.4	.7	1.5	2.5	17.3	10.9	.9	0.0	85.4	64.9
March	8.6	8.6	57.9	25.0	13.6	11.1	35.7	33.5	4.7	2.1	3.0	4.7	30.6	34.2	1.7	.3	155.8	119.5
April	16.5	16.0	54.8	39.5	17.2	19.3	78.7	65.5	7.3	4.5	3.4	7.7	44.0	56.4	1.9	1.3	223.8	210.2
May	40.4	53.9	61.6	124.7	31.6	43.6	141.6	233.1	26.3	14.2	9.0	8.5	57.4	62.8	9.2	15.0	377.1	555.8
June	62.6	36.2	70.3	162.2	46.2	59.5	133.9	273.3	22.5	15.0	10.5	7.8	44.8	91.9	11.6	7.3	402.4	653.2
July	73.3	61.7	86.2	292.3	57.7	59.9	214.4	329.4	20.4	11.5	9.0	10.3	52.5	79.9	7.1	10.7	520.6	855.7
August	69.3	41.6	58.7	117.4	37.4	49.4	159.8	195.1	16.4	15.1	16.4	13.2	46.0	76.4	9.8	9.8	413.8	518.0
September	28.5	21.3	51.8	93.6	25.0	29.5	46.9	68.4	8.9	.7	11.8	10.2	27.1	43.5	4.7	4.6	204.7	271.8
October	8.8	12.0	43.8	9.6	22.2	27.0	58.7	5.6	4.1	6.0	7.2	8.0	22.4	31.2	.6	.5	167.8	99.9
November	8.1	7.9	56.9	19.0	14.1	14.6	32.1	5.6	2.0	.4	4.7	3.9	13.4	27.9	.3	.5	131.6	79.8
December	5.0	4.4	22.5	6.0	7.8	4.2	15.8	2.3	1.0	0.0	2.8	1.2	16.7	18.8	.2	.5	71.8	37.4
Total	332.0	272.9	608.6	925.4	289.7	324.5	958.7	1263.5	115.6	74.6	80.2	81.0	375.5	544.4	48.4	50.6	2808.7	3536.9

Source: Data obtained from Tulsa and Little Rock Districts, U.S. Army Corps of Engineers.

APPENDIX TABLE 6

Table 2.9: Boating Activity Days, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in 1,000)

Month	Keystone		Fort Gibson		Eufaula		Tenkiller		Oolagah		Oklahoma Main Channel		Arkansas Above Little Rock		Arkansas Above Little Rock		Monthly Total	
	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975
January	2.2	2.3	11.3	14.7	14.3	12.0	12.1	15.2	1.0	2.7	5.1	7.4	.9	5.5	6.9	9.5	53.8	69.3
February	2.6	2.2	18.1	9.3	18.2	9.1	14.0	19.4	1.9	.4	6.8	3.0	3.6	4.0	19.5	12.2	84.7	59.6
March	4.4	4.1	38.4	16.9	32.6	22.3	22.7	22.4	4.3	1.8	13.1	3.7	7.3	12.7	19.8	13.3	142.6	97.2
April	7.1	7.7	36.2	26.3	35.9	33.6	39.0	43.4	5.8	4.8	17.8	6.7	10.8	20.2	19.7	33.4	172.3	176.1
May	13.4	14.6	40.7	40.7	50.7	64.3	69.1	76.9	18.8	12.0	30.6	19.5	20.9	19.6	28.1	54.6	272.3	302.2
June	22.8	13.6	47.2	53.9	70.2	91.5	66.1	90.7	13.0	5.8	39.5	16.9	17.1	33.6	34.5	32.2	310.4	338.2
July	27.1	23.1	57.6	94.9	81.7	83.0	105.3	109.1	11.7	9.7	26.0	18.2	19.0	22.6	27.1	41.9	355.5	402.5
August	24.5	16.7	39.1	37.7	60.5	72.7	77.0	62.5	9.4	12.8	36.9	33.1	16.2	28.1	40.8	37.4	304.4	301.0
September	8.6	8.4	34.7	10.2	35.5	43.2	23.2	22.5	5.4	.5	25.3	23.7	10.4	16.6	18.3	18.4	161.4	143.5
October	3.8	5.7	29.2	4.4	31.4	36.5	27.5	3.7	3.9	4.9	27.6	18.4	1.5	11.1	18.7	11.7	143.6	96.4
November	4.4	3.1	37.9	8.2	23.4	25.1	21.3	3.8	.1	2.2	12.9	12.2	.8	8.8	10.8	18.0	111.6	81.4
December	2.6	1.9	15.1	2.5	13.4	7.2	10.7	1.4	.8	1.2	8.3	6.2	.6	7.9	5.5	18.0	57.0	46.3
Total	123.5	103.4	405.5	319.7	467.8	500.5	488.0	471.0	76.1	58.8	249.9	169.0	109.1	190.7	249.7	300.6	2169.6	2113.7

Source: Data obtained from Tulsa and Little Rock Districts, U.S. Army Corps of Engineers.

APPENDIX TABLE 7

Table 2.10: Swimming Activity Days, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in 1,000)

	Keystone		Fort Gibson		Eufaula		Tenkiller		Oologah		Oklahoma Main Channel		Arkansas Above Little Rock		Arkansas Below Little Rock		Monthly Total	
	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975
January	000.0	000.0	00.0	000.0	00.0	00.0	00.0	000.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	000.0	000.0
February	000.0	000.0	00.0	000.0	00.0	00.0	00.0	000.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	000.0	000.0
March	000.0	000.0	00.0	000.0	00.0	00.0	00.0	000.0	00.0	00.0	00.0	00.0	8.2	00.0	00.0	00.0	8.2	000.0
April	000.0	000.0	00.0	000.0	1.1	0.2	00.0	000.0	00.0	00.0	00.0	00.0	12.0	00.0	00.0	00.0	13.1	0.2
May	162.2	192.5	19.0	121.1	22.3	28.0	34.5	226.4	3.9	20.1	21.5	39.8	14.5	17.6	6.6	14.1	284.5	659.6
June	289.3	166.1	23.6	160.8	46.9	61.6	33.0	258.7	6.2	19.1	28.4	34.6	12.1	14.8	6.4	8.2	445.9	723.9
July	341.6	269.9	28.6	283.1	64.2	63.1	52.5	309.2	6.7	15.9	29.8	32.8	15.7	13.7	6.2	8.4	545.3	996.1
August	320.0	193.5	19.3	113.2	44.2	58.4	38.5	184.8	5.6	21.5	34.6	23.1	13.0	11.2	15.0	5.1	490.2	610.8
September	104.2	000.0	7.5	112.9	16.5	23.8	4.6	65.8	1.6	00.0	5.8	0.1	7.3	7.8	4.8	2.6	152.3	213.0
October	000.0	000.0	00.0	000.0	00.0	00.0	00.0	000.0	00.0	00.0	0.3	00.0	00.0	00.0	00.0	00.0	0.3	000.0
November	000.0	000.0	0.1	000.0	00.0	00.0	00.0	000.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	0.1	000.0
December	000.0	000.0	00.0	000.0	00.0	00.0	00.0	000.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	000.0
Total	1217.3	822.0	98.1	791.1	195.2	235.1	163.1	1044.9	24.0	76.6	120.4	130.4	82.8	65.1	39.0	38.4	1939.9	3203.6

Source: Data obtained from Tulsa and Little Rock Districts, U.S. Army Corps of Engineers.

APPENDIX TABLE 8

Table 2.11: Skiing Activity Days, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in 1,000)

	Keystone		Fort Gibson		Eufaula		Tenkiller		Oologah		Oklahoma Main Channel		Arkansas Above Little Rock		Arkansas Below Little Rock		Monthly Total	
	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975
January	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	0.0	0.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0
February	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	0.0	0.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0
March	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	0.0	0.0	00.0	00.0	7.1	00.0	00.0	00.0	7.1	00.0
April	00.0	00.0	00.0	00.0	0.8	00.0	00.0	00.0	0.8	0.0	00.0	00.0	10.6	00.0	00.0	00.0	12.2	00.0
May	13.6	12.9	19.0	20.2	9.6	12.8	34.5	37.7	2.3	1.8	2.9	3.8	13.4	15.5	6.3	10.2	101.6	114.9
June	21.3	13.4	23.6	26.6	17.5	22.1	33.0	43.2	1.5	1.7	4.2	3.6	10.9	15.4	7.3	5.6	119.3	131.6
July	25.8	30.1	28.6	47.2	21.9	21.5	52.5	51.5	1.3	1.4	4.1	5.1	14.9	18.8	7.2	7.7	156.3	183.4
August	23.0	19.7	19.3	19.1	15.6	19.9	38.5	30.6	1.0	2.8	7.9	3.6	12.5	11.6	11.1	6.4	128.9	113.7
September	8.4	00.0	7.4	34.3	7.3	9.8	4.6	11.1	1.0	0.0	3.9	00.0	6.7	8.5	5.0	3.3	44.3	67.0
October	00.0	00.0	00.0	00.0	00.0	00.0	1.1	00.0	0.0	0.0	0.2	00.0	00.0	00.0	00.0	00.0	1.3	00.0
November	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	0.0	0.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0
December	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	0.0	0.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0
Total	92.1	76.1	97.9	147.4	72.7	86.1	164.2	174.1	7.9	7.7	23.2	16.1	76.1	69.8	36.9	33.2	571.0	610.6

Source: Data obtained from Tulsa and Little Rock Districts, U.S. Army Corps of Engineers.

APPEXDIX TABLE 9

Table 2.12:Other Activity Days, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in 1,000)

	Keystone		Fort Gibson		Eufaula		Tenkiller		Oologah		Oklahoma Main Channel		Arkansas Above Little Rock		Arkansas Below Little Rock		Monthly Total	
	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975
January	00.0	00.0	11.3	14.7	20.4	18.4	12.5	15.1	0.2	13.4	4.5	8.1	2.9	6.3	0.3	1.9	52.1	77.9
February	00.0	00.0,	18.1	9.2	23.3	14.8	14.1	19.3	0.7	3.0	4.9	5.5	22.1	17.2	0.4	1.9	83.6	70.9
March	00.0	00.0	38.5	16.9	50.9	25.1	23.1	22.2	1.5	9.9	12.9	10.0	3.1	2.6	0.4	1.6	130.4	88.3
April	00.0	00.0	36.3	26.2	32.9	29.0	39.3	42.6	1.5	14.4	13.8	16.3	3.2	5.4	0.3	4.6	127.3	138.5
May	9.7	7.4	40.8	47.0	33.7	39.2	69.9	78.4	3.9	9.4	17.3	21.7	20.0	15.5	7.0	12.1	202.3	230.7
June	5.1	4.6	47.4	55.5	52.3	70.9	66.6	92.5	2.7	9.9	24.0	20.4	18.1	54.0	7.0	8.1	223.2	315.9
July	6.3	2.7	57.8	110.8	58.6	57.7	106.3	111.6	2.4	7.7	17.6	24.2	17.3	49.9	5.7	8.7	272.0	373.3
August	13.4	5.3	39.1	44.9	45.9	57.9	78.3	67.0	1.8	10.6	9.8	39.6	15.4	45.4	11.9	5.7	215.6	276.4
September	5.4	0.6	34.8	6.8	20.9	26.3	23.4	23.0	1.6	0.6	8.3	27.4	17.1	19.8	4.0	3.3	115.5	107.8
October	00.0	7.7	29.2	1.1	21.7	20.6	28.2	4.4	1.1	6.6	5.4	29.9	9.1	5.4	0.1	3.2	94.8	78.9
November	00.0	5.1	37.6	2.7	21.0	22.9	21.2	5.0	3.6	3.8	4.5	23.7	2.9	4.6	0.1	1.4	90.9	69.2
December	00.0	2.8	15.0	0.8	17.9	9.3	10.7	1.5	3.3	1.8	2.7	10.8	3.3	2.4	0.1	1.4	53.0	30.8
Total	39.9	36.2	405.9	336.6	399.5	392.1	493.6	482.6	24.3	91.1	125.7	237.6	134.5	228.5	37.3	53.9	1660.7	1858.6

Source: Data obtained from Tulsa and Little Rock Districts, U.S. Army Corps of Engineers.

APPENDIX TABLE 10

Table 2.13: Hunting Activity Days, by Lake and Area, McClellan-Kerr Arkansas River Navigation System, 1974 and 1975

(Figures in 1,000)

	Keystone		Fort Gibson		Eufaula		Tenkiller		Oolagah		Oklahoma Main Channel		Arkansas Above Little Rock		Arkansas Below Little Rock		Monthly Total	
	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975
January	0.1	7.6	5.2	3.0	0.3	2.8	2.8	3.0	1.5	2.2	4.4	5.6	4.4	7.8	3.8	2.1	22.5	34.1
February	0.0	0.0	3.5	3.0	2.2	2.2	2.8	3.0	1.1	6.5	4.2	0.0	4.2	4.5	5.6	2.1	23.6	21.3
March	0.0	0.0	0.0	3.0	3.2	3.2	0.0	3.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	9.2
April	0.0	0.0	0.0	3.0	2.0	2.0	0.0	0.0	2.2	0.0	0.0	2.4	0.0	0.0	0.0	0.0	4.2	7.4
May	0.0	0.0	0.0	3.0	3.6	1.8	0.0	0.0	5.9	0.0	0.9	0.6	0.0	0.0	0.0	0.0	10.4	5.4
June	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	4.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0
July	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.0	3.5	0.0	1.2	0.0	0.0	0.0	0.0	0.0	7.5	0.0
August	0.0	0.0	0.0	0.0	3.2	0.7	0.0	0.0	2.7	0.0	0.7	0.0	0.0	0.0	0.0	0.0	6.6	0.7
September	0.0	0.0	4.0	0.0	5.0	1.5	2.0	0.0	11.1	0.0	1.5	0.0	0.0	0.0	0.0	0.0	23.6	1.5
October	1.1	15.7	4.0	0.0	6.8	6.1	4.0	0.0	10.8	0.0	1.4	2.5	12.9	0.0	5.6	0.0	46.6	24.3
November	1.0	5.1	4.0	0.0	8.0	3.7	4.0	0.0	17.9	2.3	3.9	15.9	7.6	0.0	3.5	0.0	49.9	27.0
December	7.5	2.8	4.0	0.0	6.4	4.8	4.0	0.0	7.2	3.4	2.9	11.1	6.7	0.0	3.5	0.0	42.2	22.1
Total	9.7	31.2	24.7	15.0	45.5	28.8	19.6	9.0	70.3	14.4	22.1	38.1	35.8	12.3	22.0	4.2	249.7	153.0

Source: Data obtained from Tulsa and Little Rock Districts, U.S. Army Corps of Engineers.

APPENDIX B

METHODOLOGY FOR ESTIMATING INTERREGIONAL IMPACTS RESULTING FROM RECREATION EXPENDITURES AT THE McCLELLAN-KERR ARKANSAS RIVER NAVIGATION SYSTEM

Recreationists at the McClellan-Kerr Arkansas River Navigation System are shown to have a direct impact both within the study region and outside the the region through expenditures on current account and recreation equipment and facilities' capital account (Table 4.17.). In addition to the direct economic impact, recreation expenditures generate indirect and induced impacts within the study region and outside the region. A set of interregional input-output models (IRIO) were constructed for the McClellan-Kerr Arkansas River Navigation System and are summarized in the IWR report prepared by Dr. Ungsoo Kim (Contract No. DACW31-74-C-0047).[1] The Purpose of this Appendix is to relate results of the present study to the IRIO models for determining total regional and interregional impacts from recreation expenditures.

The total economic impact of any final demand component, such as recreation expenditures, is expected to be 1.5 to 6.0 times as great as the direct impact as revealed in secondary impact studies [Kim, 1975; Schreiner, Chang and Flood, 1976]. Secondary impacts arise from the interdependence of one sector with other sectors in a state or regional economic [Mierynk, 1965; Richardson, 1972].

Interdependence arises not only among sectors within a state but also among sectors between states [Moses, 1960; Richardson, 1972]. For example, an increase in demand for pick-up campers in Oklahoma increases automotive output in Detroit which, in turn, increases flow of steel output from Pittsburgh. The first comprehensive accounting of commodity flows among states is recorded in Rodgers [1974]. The interregional trade flows also permit estimation of feedbacks [Richardson, 1972]. An increase in demand for pick-up campers in Oklahoma increases automotive output in Detroit which in turn stimulates trade with Oklahoma for petroleum products output. The importance of interregional feedback has varied in empirical studies from insignificant changes in regional multipliers to 20 percent changes [Richardson, 1972, p. 81].

Structure of an Interregional Model

The ability to quantify regional and interregional economic impacts of the McClellan-Kerr Arkansas River Navigation System has been greatly

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[1]Kim, Ungsoo, "An Application of the Interregional I/O Model for the Study of the Impact of the McClellan-Kerr Arkansas River Multiple Purpose Project." Report submitted to the Institute for Water Resources (Contract No. DAWC31-74-C-0047), U. S. Army Corps of Engineers, Ft. Belvoir, Virginia, March, 1975.

enhanced by the availability of data sets recently developed by the Harvard Economics Research Project (HERP). These data sets are contained in the multiregional input-output analysis studies (MRIO) [Polenske, 1972; Polenske, 1974; Rodgers, 1972; Rodgers, 1973; Scheppach, 1972]. The MRIO model is the first large scale, disaggregated interregional model developed for the U.S. The complete MRIO model has 51 regions with 79 endogenous sectors in each region. Computer requirements are massive and to date there have been few complete interregional solutions.

Base year for the MRIO model is 1963. A subsequent national input-output model has been estimated for 1967. However, the supporting 1967 regional data sets including interregional commodity trade flows are not presently available.

Interregional impact models are composed of production and trade relationships. For example, consider a model with three industry sectors: (1) agriculture, (2) manufacturing, and (3) services. Three regions are defined: (1) the direct impact region of the McClellan-Kerr Arkansas River Navigation System, (2) East of the Mississippi, and (3) West of the Mississippi. Regions are denoted by superscripts, industries by subscripts. The balance equations of an interregional model show that the output of each industry is completely distributed among sales to other sectors within the region, sales to other sectors in other regions, and sales to final demand in all regions. Recreation expenditures on current account and on recreation equipment and housing construction are all part of final demand. This is expressed as:[1]

$$\underbrace{X_1^1}_{\substack{\text{Output of}\\ \text{Sector 1 in}\\ \text{Region 1}}} - \underbrace{X_{11}^{11} - X_{12}^{11} - X_{13}^{11}}_{\substack{\text{Sales to}\\ \text{sectors in}\\ \text{Region 1}}} - \underbrace{X_{11}^{12} - X_{12}^{12} - X_{13}^{12} - X_{11}^{13} - X_{12}^{13} - X_{13}^{13}}_{\substack{\text{Sales to sectors in}\\ \text{all other regions}}} = \underbrace{Y_1^{11} + Y_1^{12} + Y_1^{13}}_{\substack{\text{Sales to final}\\ \text{demand in all}\\ \text{regions}}}$$

$$\vdots \qquad \vdots \qquad \vdots \qquad \vdots$$

$$\underbrace{X_3^3}_{\substack{\text{Output of}\\ \text{Sector 3 in}\\ \text{Region 3}}} - \underbrace{X_{31}^{31} - X_{32}^{31} - X_{33}^{31} - X_{31}^{32} - X_{32}^{32} - X_{33}^{32}}_{\substack{\text{Sales to sectors}\\ \text{in all other regions}}} - \underbrace{X_{31}^{33} - X_{32}^{33} - X_{33}^{33}}_{\substack{\text{Sales to other}\\ \text{sectors in}\\ \text{Region 3}}} = \underbrace{Y_3^{31} + Y_3^{32} + Y_3^{33}}_{\substack{\text{Sales to final}\\ \text{demand in all}\\ \text{regions}}}$$

[1] This discussion borrows from Moses [1960].

This set of nine equations cannot, by itself, be solved. Two sets of structural equations are required for its solution. The first set defines the structure of production in each region and the second defines the structure of trade among the regions.

Structure of Production. The structure of production in each region is manifest in the interindustry flow (or transactions) table. From the flow tables the direct production coefficients are derived as in a single region input-output model. The assumption is made that an industry's inputs are a constant proportion of its output. For example, in region one the technical coefficients can be shown as:

East

East

$$\begin{bmatrix} a^1_{11} = \dfrac{x^1_{11}}{x^1_1} & a^1_{12} = \dfrac{x^1_{12}}{x^1_2} & a^1_{13} \dfrac{x^1_{13}}{x^1_3} \\ a^1_{21} = \dfrac{x^1_{21}}{x^1_1} & a^1_{22} = \dfrac{x^1_{22}}{x^1_2} & a^1_{23} = \dfrac{x^1_{23}}{x^1_3} \\ a^1_{31} = \dfrac{x^1_{31}}{x^1_1} & a^1_{32} = \dfrac{x^1_{32}}{x^1_2} & a^1_{33} = \dfrac{x^1_{33}}{x^1_3} \end{bmatrix}$$

The technical coefficient a^1_{12} is the amount of input purchased by industry two located in region one from industry one (located in any region) per unit of output of industry two. Technical coefficients are derived for each region in the same fashion.

Structure of Trade. A second set of equations defines the per unit flow of commodities among and within regions. Again, fixed coefficients are assumed such that each region purchases its requirements of every good according to a fixed regional supply pattern. The structure of trade is identified by a set of trade coefficients for each good. The derivation of the trade coefficient is straightforward. Let r indicate the value of a region's purchases of a good from other regions and itself. Then r^{13}_1 is the value of agricultural goods (sector 1) bought by region three from region one. The sum of purchases of agricultural goods from all regions by

region 3 is indicated by R_1^3. The trade coefficient is obtained by division:

$$t^{13} = \frac{r_1^{13}}{R_1^3}$$

The trade coefficients are also presented in matrix form for a region, and are derived equivalently for each sector:

		Reg 1	Reg 2	Reg 3
	Reg 1	$t_1^{11} = \frac{r_1^{11}}{R_1^1}$	$t_1^{12} = \frac{r_1^{12}}{R_1^2}$	$t_1^{13} = \frac{r_1^{13}}{R_1^3}$
Sector 1	Reg 2	$t_1^{21} = \frac{r_1^{21}}{R_1^1}$	$t_1^{22} = \frac{r_1^{22}}{R_1^2}$	$t_1^{23} = \frac{r_1^{23}}{R_1^3}$
	Reg 3	$t_1^{31} = \frac{r_1^{31}}{R_1^1}$	$t_1^{32} = \frac{r_1^{32}}{R_1^2}$	$t_1^{33} = \frac{r_1^{33}}{R_1^3}$

Interregional Structure. From the two sets of structural relations a new matrix is derived which includes both trade and production coefficients. The derived coefficients (b_{ij}^{km}) indicate the proportion of sector i's output purchased by region m from region k to produce a unit of output in sector j. Thus, for example, $b_{12}^{32} = a_{12}^2 \cdot t_1^{32}$. It is assumed that goods brought into the region are used in the same proportion by a region's industries as are inputs produced in the region. The nine balance equations, now solvable, can be written as:

$$x_1^1 - b_{11}^{11}x_1^1 - b_{12}^{11}x_2^1 - b_{13}^{11}x_3^1 - \ldots - b_{11}^{13}x_1^3 - b_{12}^{13}x_2^3 - b_{13}^{13}x_3^3 = t_1^{11}y_1^1 + t_1^{12}y_1^2 + t_1^{13}y_1^3$$

$$\vdots$$

$$x_3^3 - b_{31}^{31}x_1^1 - b_{32}^{31}x_2^1 - b_{33}^{31}x_3^1 - \ldots - b_{31}^{33}x_1^3 - b_{32}^{33}x_2^3 - b_{33}^{33}x_3^3 = t_3^{31}y_3^1 + t_3^{32}y_3^2 + t_3^{33}y_3^3$$

The basic data sets then are (1) input-output coefficients, (2) trade flows, and (3) final demands.

Dimensions of the IRIO Model[3]

The IRIO impact model constructed for the McClellan-Kerr Arkansas River Navigation System by Dr. Ungsoo Kim divides the U.S. into four regions. The impact region (Region I) is the Arkansas River Valley which consists of BEA economic areas 117, 118, and 119: parts of the states of Arkansas and Oklahoma. The Southern Region (Region II) consists of the states of Texas and Louisiana and the rest of Arkansas and Oklahoma not part of the impact region. The Northern Region (Region III) consists of the States of Kansas and Missouri, and Region IV is the rest of the United States. The regional divisions are aimed at tracing the economic impacts according to the existing major trade patterns of the impact region with other regions.

The primary data sets for the IRIO model are: regional technical coefficients, trade coefficients among regions, the pattern of household income and consumption by each industrial sector, and the pattern of final demands. The regional technical coefficient matrices for the IRIO are estimated from the 51 states' (including Washington, D.C.) technical coefficient matrices estimated by the Harvard Research group for the Economic Development Administration, Department of Commerce [Polenske, 1970]. The state technical coefficients in the Harvard study are estimated by the 1963 national technical coefficients weighted by the product mix pattern of each state in the same year. To estimate the coefficient matrix for the IRIO, each states' input-output table is aggregated into four internal regions. Because the states of Arkansas and Oklahoma are divided into the Impact Region and the Southern Region, however, each of the above two states' input-output tables are divided into two corresponding parts.

The basic source of regional trade patterns is the trade flow data of 44 U.S. regions in the MRIO by the Harvard study. In the MRIO the trade flows among 44 regions in the United States for 79 industrial sectors were estimated using 1963 manufacturing and transportation census and other census data for agricultural and mining industries. The estimate of trade

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[3]This discussion draws on the Ungsoo Kim Report (1975).

flows in the IRIO is estimated by aggregating and disaggregating the trade flows of 44 U.S. regions into four IRIO region trade flows.

Disaggregating the MRIO data for Oklahoma and Arkansas to facilitate estimating the substate portions of the impact region required two basic assumptions: (1) the production functions of the same industry for the substate areas are assumed to equal the state functions [Kim, 1975, Appendix A, p. A20]. (2) The trade flows for substate regions are estimated assuming (a) value of shipments to each purchasing region are proportional to that substate regions' share of state output and (b) value of receipts from each shipping region are proportional to that substate region's share of state demands [Kim, 1975, Appendix A, p. A32].

Results of the IRIO model is a technology matrix (A) for the four regions as the following:

$$\begin{bmatrix} A^{I} & 0 & 0 & 0 \\ 0 & A^{II} & 0 & 0 \\ 0 & 0 & A^{III} & 0 \\ 0 & 0 & 0 & A^{IV} \end{bmatrix}$$

A trade matrix (t) results as the following:

$$\begin{bmatrix} T^{11} & T^{12} & T^{13} & T^{14} \\ T^{21} & T^{22} & T^{23} & T^{24} \\ T^{31} & T^{32} & T^{33} & T^{34} \\ T^{41} & T^{42} & T^{43} & T^{44} \end{bmatrix}$$

Each of the T^{km} matrices is a 79 sector diagonal matrix. The matrices forming the principal diagonal identify intraregional shipments; thus nontraded commodities are accounted for in these matrices. In the off-diagonal matrices non traded commodities receive a zero value.

These matrices form the structural parts of the conventional interregional input-output equation:

$$X = (I - TA)^{-1} TY$$

where X is a vector of output by industry and region, Y is a vector of final demands by industry and region and I is an identity matrix. The computer programs and IRIO data sets for these two matrices are contained in [Kim, 1975, Appendix A, p. C2].

Integrating Recreation Expenditure Results

Recreation expenditures as estimated in Table 4.17 of the main body of this text form part of the final demand for the input-output accounting system. Therefore, the portion of the recreation expenditures purchased within the impact region are part of the final demand for Region I as outlined in the IRIO model. The portion of the recreation expenditures purchased outside the impact region are less well defined in terms of originating region. Since it is possible to trace recreationists by state (and zip code) of origin it is proposed that recreation expenditures purchased outside of the impact region be allocated in proportion to origins of recreationists.

Regional impacts of the recreation expenditures associated with the McClellan-Kerr Arkansas River Navigation System can now be traced using the IRIO model and data sets. Regional output associated with recreation expenditures are estimated as the following:

$$\Delta X = (I - TA)^{-1} T \Delta Y$$

where:

ΔY = current account recreation expenditures for 1975 associated with the McClellan-Kerr Arkansas River Navigation System

ΔX = regional outputs for 1975 associated with the recreation expenditures

$(I - TA)^{-1} T$ = structural components of the IRIO model

It should be remembered that the structural components of the IRIO model represents estimates of technology and trade for 1963. However, recreation expenditures represent current accounts for 1975. Changes in technology and trade will bias the results of estimated regional outputs.

Regional Economic Impacts of Recreation Expenditures

Regional economic impact variables generally relate to employment or income. Measures of employment most frequently used in impact analyses include (1) wage and salary employment, (2) work force data, (3) labor force data and (4) full-time equivalents [Schreiner, Chang, and Flood, 1976]. Measures of income include (1) value added, (2) employee payrolls, and (3) payroll and proprietor income.

Regional changes in economic impact variables associated with changes in recreation expenditures can be estimated using the IRIO model and estimates of economic impact to output ratios. The following is an expression of the change in an economic impact variable given a change in recreation expenditures:

$$\Delta E = \frac{E}{X} \Delta X = \frac{E}{X} (I - TA)^{-1} T \Delta Y$$

where:

ΔE = change in the total economic impact variable

$\frac{E}{X}$ = change in the economic impact variable per dollar change in industry output

ΔX = change in industry output

ΔY = change in recreation expenditures

For estimates of various impact variables for Oklahoma and other regional aggregates see Schreiner, Chang, and Flood [1976].

APPENDIX C

ALLOCATION OF RECREATION EXPENDITURES TO INPUT-OUTPUT (HERP) SECTORS

Expenditures Item	SIC[a] Code	HERP[b] Code	Notes
Lodging			
Motel, hotel or cabin rental, sleeping equip. (non-motorized)	70	72	
Trailer or camper	7519	75	
Tent	79	76	
Camping fees, including electirc hookups			
Public (gov't)	9179	78	
Private	7031	72	
Food & Beverages			
Brought from home			
A		1 (3.0%)	Distribution from Current Expenditure Survey
B		2 (4.9%)	
C		3 (0.8%)	
D		14 (87.8%)	
E		65 (0.2%)	
F		69 (0.5%)	
G		80 (2.8%)	
Purchased in restaurants			
A		1 (2.4%)	
B		2 (3.9%)	
C		3 (0.6%)	
D		14 (70.6%)	
E		65 (0.2%)	
F		69 (20.0%)	
G		80 (2.3%)	

Expenditure Item	SIC Code	HERP Code	Notes
Purchased from stores			
A		1 (3.0%)	
B		2 (4.9%)	
C		3 (0.8%)	
D		14 (87.8%)	
E		65 (0.2%)	
F		69 (0.5%)	
G		80 (2.8%)	
Charcoal, lighter fluid	28	27	
Ice	2097	14	
Other			
Transportation			
Gas and oil	2911	31	
Auto or Vehicle repair			
A		19 (1.1%)	Distribution from Current Expenditure Survey
B		27 (1.1%)	
C		29 (0.6%)	
D		32 (20.6%)	
E		42 (0.3%)	
F		55 (0.4%)	
G		58 (3.7%)	
H		59 (2.2%)	
I		65 (0.1%)	
J		75 (65.8%)	
K		79 (3.7%)	
L		83 (0.4%)	
Vehicle rental	75	75	
Commerical fares (air, train, bus, etc.)	40,41,45	65	
Tolls for turnpike		79	
Other			
Recreation Activities & Supplies			
Boat & Motor rental	7949	76	
Boat gas & oil	2911	31	
Boat launching and other user fees (excluding camping fees)	4469	65	

Expenditure Item	SIC Code	HERP Code	Notes
Amusements (putt-putt, horseshoes, golf, paddle boats, movies)	79	76	
Other			
Other Current Expenditures			
Gifts	3999	64	
Curios	3999	64	
Insect repellents, suntan lotions, chapstick	28	29	
Other			
Annual Boating Expenditures			
Boat repairs	3732	61	
Boat storage	4469	65	
Insurance	63,64	70	
License & reg. fees		84A	
Auxiliary accessories			
A		(50%)	Distribution based on sample
B		(50%)	
Other			
Annual Fishing Expenditures			
Rods and reels	3949	64	
Fishing equip. and supplies			
A fishing tackle	3949	64(45%)	Distribution based on sample
B bait	59	69(45%)	
C waders & tubes	3021	32(10%)	
Fishing licenses		state gov't.	
Fishing guides & Services	7949	76	
Other			
A		32 (5%)	
B		64 (46%)	
C		69 (40%)	
D		76 (3%)	
E		84A (6%)	
Annual Water Skiing Expenditures			
Water skis	3949	64	
Ski belts	3069	32	
Other		17	

Expenditure Items	SIC Code	HERP Code	Notes
Annual Camping Expenditures			
Camping equipment			Distribution based on
A		22 (35%)	sample of questionnaires
B		32 (15%)	
C		38 (10%)	
D		40 (10%)	
E		54 (15%)	
F		55 (15%)	
Camping equip. repairs	7699	73	
Camping fuels	29	31	
Vehicle insurance	63,64	70	
Other			Distribution based on
A		65 (20%)	sample of questionnaires
B		84A (80%)	
Annual Hunting Expenditures			
Guns and Accessories	13		
Shells	13		
Hunting licenses	84A		
Decoys 64	64		
Other			Distribution based on
A		13 (87%)	items from a sample of
B		64 (2%)	questionnaires
C		84A (11%)	
Utilities and Services			
Electricity	49	68	
Natural gas	49	68	
Propane gas	29	31	
Telephone		66	
Garbage, water, sewer and patrol			Distribution based on items from a sample of
A		68 (93.5%)	questionnaires
B		79 (6.5%)	
Recreation Equipment			
Canoe	3732	61	
Boat	3732	61	
Motor	3519	43	
Boat trailer	3799	61	
Skiing Equipemtn	3949	64	
Tent	2394	19	
Camper trailer	3791	61	
Tent Trailer	3799	61	

Expenditure Item	SIC Code	HERP Code	Notes
Recreation Equipment Cont.			
Pick-up camper			
camper	3791	61 (39%)	
pick-up	3711	59 (61%)	
Motor home	3711	59	
Bicycles	3751	61	
Minibikes	3751	61	
Motorcycles	3751	61	
Other			Distribution based on items from a sample of questionnaires
Awnings & canopies, tents	239	19 (40%)	
Rubber rafts	30	32 (18%)	
Motors	3519	43 (5%)	
Bikes and boats	37	61 (34%)	
Surfboards	39	64 (3%)	

a/ Standard Industrial Classification.

b/ Harvard Economic Research Project.

APPENDIX D

____ CONFIDENTIAL CONFIDENTIAL

1975 McCLELLAN-KERR ARKANSAS RIVER SYSTEM WATERBASED RECREATION SURVEY

On-Site Recreationist Survey

Department of Agricultural Economics
Oklahoma State University
Stillwater, Oklahoma 74074

0 1 Card Number

__ __(01.07) Lake or L & D_____

__ __(01.09) PUA_____

__ __ __ __ __(01.11)Date

__ __(01.16) Interviewer_____

__ __(01.18)Time (Nearest Hour)
__ (01.20) 1. AM 2. PM

WEATHER DATA

__(01.21) 1. Sunshine 2. Cloudy
3. Windy 4. Rain

__(01.22) 1. Cool (45-64) 2. Warm (65-84)
3. Hot (85+)

TRIP INFORMATION

__ (01.23)City of residence _____
1. inside 2. outside

__ __ __(01.24)County _____

__ __ (01.27) State_____

__ __ __ __ __ (01.29)Zip Code

(01.34) Major Recreation Activities of the group on this trip:

__ 1. Camp
__ 2. Picnic
__ 3. Boat
__ 4. Fish
__ 5. Hunt
__ 6. Sightsee
__ 7. Ski
__ 8. Swim
__ 9. Other

__ (01.43) The Major Recreation Activity.

__ (01.44)Mode of Travel

1. Car
2. Vehicle-Camp Trailer
3. Vehicle-Tent Trailer
4. Station Wagon
5. Pick-up
6. Pick-up Camper
7. Motorized Camper (converted bus or van)
8. Motor Cycle
9. Other (specify)

_____

__ __ __ __(01.45) Miles from home to this recreational area.

__ __.__ __(01.49) Driving time from home to this recreational area (nearest .25 hour)

__(01.54) Is the purpose of this trip for recreational purposes only? 1. Yes 2. No

__ __(01.55) If no, percent of time for recreation?

__(01.57) Is the purpose of this recreational trip primarily to use the recreational facilities at this public use area? 1. Yes 2. No

__ __(01.58) How many days will you stay at this lake on this trip?

__(01.60) Length of trip to lake or lock & dam
1. Less than 1 day 3. Overnight(2 days)
2. 1 day 4. More than two days

__(01.61) Did you spend a night enroute to this area?
1. Yes 2. No

(00.01) If yes what town or location?

_____

__(01.62) Where do you plan to spend tonight?
1. In this immediate recreational area? (the PUA)
2. At another recreational area around this lake or L & D
3. Within the region but away from the Lake or L & D
4. Outside the region

__ __(01.63) Type of overnight accomodations you plan to use tonight?
1. Return home away from lake
2. Cabin on or near lake
3. Motel on or near lake
4. Camper vehicle on or near lake
5. Tent on or near lake
6. Seasonal home near lake
7. Permanent home near lake
8. Stay with relatives near lake
9. Stay with friends near lake
10. Sleep out on cots, sleeping bags, etc.
11. Other_____ (specify)

__(01.65)(Ask only if answer 6 or 7 on (01.63)) Do you own a seasonal or permanent home near or on this lake? 1. Yes 2. No

(00.02)(Ask only if yes on (01.65) If own seasonal or permanent home near the lake where is it located?

_____

(00.03)Ask only if No on (01.65) If you do not own the home near the lake, how much rent do you pay per month?_____

__(01.66) Have you visited other recreational areas AT THIS LAKE or L & D on this trip?
1. Yes 2. No

(00.04) If Yes, where_____

__(01.67) Have you visited other recreational areas AWAY FROM THIS LAKE or L & D on this trip? 1. Yes 2. No.

(00.05) If Yes, where_____

__ __ __(01.68) How many miles have you driven, or do you plan to drive, in this immediate (local) area for recreational purposes? 999 = 1000 or more. (On this trip)

CONFIDENTIAL

SOCIOECONOMIC DATA

__(01.71) Sex: 1. Male 2. Female

__ __(01.72) Age (Head of household)

__(01.74) Marital Status 1. Married 2. Single 3. Widow or Widower 4. Divorced

0 2 Card Number

(02.07) Number of persons in recreational party by age. (Write in number including respondent)

0-5 __ __	11-14__ __	20-29__ __	40-49__ __	60+ __ __
6-10__ __	15-19__ __	30-39__ __	50-59__ __	

__ __(02.25) Occupation (Head of household)

1. professional
2. manager; administrator
3. sales; clerical
4. craftsman
5. laborer; operative
6. service worker
7. farmer or farm worker
8. housewife
9. student
10. retired
11. not employed
12. Other_____

__ __(02.27) Typical or normal workweek of household head (hours)

__(02.29) Education (Head of household)

1. 0-6
2. 7-11
3. 12(High School)
4. 13-15
5. B.S.
6. M.S.
7. Ph.D. or M.D.
8. Technical
9. Other_____ (specify)

__(02.30) Total household income per year (note, household income includes income from all sources in the current year.)

1. under $3,000
2. $3,000-4,999
3. $5,000-6,999
4. $7,000-8,999
5. $9,000-11,999
6. $12,000-14,999
7. $15,000-19,999
8. $20,000-29,999
9. $30,000 and over

__ __(02.31) Weeks vacation you usually take per year (normal or average year)

ECONOMIC CONDITIONS AND GASOLINE SHORTAGE DATA

How has the price of gasoline (or shortage) affected your recreation related travel plans? (1975 compared to 1974)

__(02.33) Number of trips
__(02.34) Length of stay
__(02.35) Distance traveled per trip

1. more
2. same
3. less

Comments_____

__(02.36) What is the most important factor related to the fuel problem that limits your recreation activities?

1. none 2. Inconvenience (Sunday closings, etc.) 3. Price 4. Other_____

How has general economic conditions (inflation and unemployment problems) affected your recreation activities? (1975 compared to 1974)

__(02.37) Number of trips
__(02.38) Length of stay
__(02.39) Distance traveled per trip

1. more
2. same
3 less

Comments_____

__(02.40) Were you unemployed during any part of the last 12 months.

1. Yes 2. No

__ __(02.41) If yes on (02.40), how many months

RECREATION EXPENDITURES

TRIP EXPENDITURES

(02.43) What are your anticipated total expenditures on this recreational trip for LODGING?

Item	Expenditures	% Purchased in Region
Motel, hotel, or cabin	___.__	___
Rental, sleeping equip. (non-motorized)		
Trailer or camper	___.__	___
Tent	___.__	___
Camping fees, PUBLIC	___.__	___
	0 3 Card Number	
Camping fees, PRIVATE	___.__	___
Electric Hookups	___.__	___
Other (specify)	___.__	___

(03.34) What are your anticipated total expenditures on this recreation trip for FOOD and BEVERAGES?

Item	Expenditures	% Purchased in Region
Brought from home	___.__	___
Purchased in Restaurants	___.__	___
Purchased from stores (locally or enroute)	___.__	___
Charcoal, lighter fuid	___.__	___
Ice	___.__	___
	0 4 Card Number	
Other (specify)	___.__	___

(04.16) What are your anticipated total expenditures on this recreational trip for TRANSPORTATION?

Item	Expenditures	% Purchased in Region
Gas and oil	___.__	___
Auto or vehicle repair	___.__	___
Tolls for turnpike travel	___.__	___
Other (specify)	___.__	___
	0 5 Card Number	

(05.07) What are your anticipated total expenditures on this recreational trip for RECREATION related activities and supplies?

Item	Expenditures	% Purchased in Region
Boat and/or motor rental	___.__	___
Boat gas & oil	___.__	___
Amusements (putt-putt, horseshoes, golf, paddle boats, movies)	___.__	___
Other (specify)	___.__	___

(05.43) What are your anticipated total expenditures on this recreational trip for OTHER items not included in the previous items?

Item	Expenditures	% Purchased in Region
Gifts	___.__	___
Curios	___.__	___
Insect repellents, suntan lotions, chapstick	___.__	___
Other (specify)	___.__	___
	0 6 Card Number	

ANNUAL EXPENDITURES

What are your ANNUAL average expenditures for RECREATION activities, supplies and services?

(06.07) BOATING 1. Yes 2. No →		Annual Average Expenditures	% Purchased in Region
Boat repairs	__	___.__	___
Boat storage		___.__	___
Insurance		___.__	___
License & Reg. Fees		___.__	___
Auxiliary accessories (Lights, preservers)		___.__	___
Other (specify)		___.__	___

(06.62) FISHING 1. Yes 2. No →		Annual Average Expenditures	% Purchased in Region
Boat services (see BOATING)			
Rods and Reels	__	___.__	___
	0 7 Card Number		
Fishing equipment and supplies (tubes, waders, tackle, lures bait)		___.__	___
Fishing Licenses		___.__	___
Other (specify)		___.__	___

WATER (07.34) SKIING 1. Yes 2. No →		Annual Average Expenditures	% Purchased in Region
Boat services (See BOATING)			
Water skis	__	___.__	___
Ski belts (not preservers)		___.__	___
Ropes		___.__	___
Other (specify)		___.__	___
	0 8 Card Number		

(08.07) CAMPING 1. Yes 2. No →		Annual Average Expenditures	% Purchased in Region
Camping equipment (lawn chairs, hammocks)	__	___.__	___
Camping equipment maintenance repairs		___.__	___
Camping fuels (Butane, etc.)		___.__	___
Camping vehicle insurance		___.__	___
Camper storage		___.__	___
Other (specify)		___.__	___

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0 9 Card Number

RECREATION EQUIPMENT INVENTORY
(Includes only the equipment the recreationist have with them when interviewed)

Item	Description	Quantity	Estimated Market Value	Approximate Age of Equipment	City Where Purchased
Canoe	___(09.07) Length	__(09.10)	_____(09.12)	__(09.17)	__(09.19) _____
Boat	___(09.20) Length	__(09.23)	_____(09.25)	__(09.30)	__(09.32) _____
Motor	___(09.33) H.P.	__(09.36)	_____(09.38)	__(09.43)	__(09.45) _____
Boat trailer		__(09.46)	_____(09.48)	__(09.53)	__(09.55) _____
Skiing Equipment		__(09.56)	_____(09.58)	__(09.63)	__(09.65) _____

1 0 Card Number

Tent	___(10.07) x	__(10.10)	_____(10.12)	__(10.17)	__(10.19) _____
Camper Trailer	___(10.20) Length	__(10.22)	_____(10.24)	__(10.29)	__(10.31) _____
Tent Trailer	__(10.32) Number Sleeps	__(10.34)	_____(10.36)	__(10.41)	__(10.43) _____
Pick-up Camper		__(10.44)	_____(10.46)	__(10.51)	__(10.53) _____
Pick-up	___(10.54) % Rec. Use	__(10.57)	_____(10.59)	__(10.64)	__(10.66) _____

1 1 Card Number

Motor Home	__(11.07) Length	__(11.09)	_____(11.11)	__(11.16)	__(11.18) _____
Bicycles	__(11.19) Type	__(11.21)	_____(11.23)	__(11.28)	__(11.30) _____
Minibikes	___(11.31) % Rec. Use	__(11.34)	_____(11.36)	__(11.41)	__(11.43) _____
Motorcycles	___(11.44) % Rec. Use	__(11.47)	_____(11.49)	__(11.54)	__(11.56) _____
Other_____		__(11.57)	_____(11.59)	__(11.64)	__(11.66) _____
Other_____		__(11.67)	_____(11.69)	__(11.74)	__(11.76) _____

BOAT AND TRAILER STORAGE (Ask only if Recreationist has Equipment)

__(11.77) Where is boat stored or parked when not being used for recreation?
1. Home 2. This Lake Area 3. Other (Specify) _____

__(11.78) Cost of boat storage (Monthly Rate)
1. No Charge
2. Less than $5.00
3. $5 - 9.99
4. $10 - 14.99
5. $15 - 19.99
6. $20-29.99
7. $30 or more

(00.06) How is the boat storage rental rate determined? _____

_____

__(11.79) Where is camper trailer or camping vehicle stored or parked when not being used for recreation?
1. Home 2. This Lake Area 3. Other (Specify) _____

__(11.80) Cost of Camper Trailer Storage (Monthly Rate)
1. No Charge
2. Less than $5.00
3. $5 - 9.99
4. $10 - 14.99
5. $15 - 19.99
6. $20 - 29.99
7. $30 or more

(00.07) How is the trailer storage rental rate determined? _____

_____

VISITATION DATA

1 2 Card Number

__ __ (12.07) When did you first use this lake?

1. 1975 3. 1973 5. 1971 7. 1969 9. 1967 11. 1965

2. 1974 4. 1972 6. 1970 8. 1968 10. 1966 12. Before 1965

In the table below fill in the blanks by indicating the number of visits to this Lake or L&D for the period listed on the left. Complete the second column by indicating the average length of visit for trips in each period. (2 or 3 = 2.5, 3 or 4 = 3.5, etc.) (<1 day = .5)

1 3 Card Number

Month	Number of Visits	Average Length of Visit		Number of Visits	Average Length of Visit
January	(12.09) __ __.__	(12.23) __ __.__	July	(13.07) __ __.__	(13.31) __ __.__
February	(12.11) __ __.__	(12.17) __ __.__	August	(13.11) __ __.__	(13.35) __ __.__
March	(12.17) __ __.__	(12.41) __ __.__	September	(13.15) __ __.__	(13.39) __ __.__
April	(12.21) __ __.__	(12.45) __ __.__	October	(13.19) __ __.__	(13.43) __ __.__
May	(12.25) __ __.__	(12.49) __ __.__	November	(13.23) __ __.__	(13.47) __ __.__
June	(12.29) __ __.__	(12.53) __ __.__	December	(13.27) __ __.__	(13.51) __ __.__

1 4 Card Number

How many days PER YEAR do you engage in various water and related land-based recreational activities: (Total at all lakes including this lake, and then at this lake only)?

(14.07) Boating: Total __ __ __
At this lake __ __ __

(14.13) Fishing: Total __ __ __
At this lake __ __ __

(14.19) Skiing: Total __ __ __
At this lake __ __ __

(14.25) Camping: Total __ __ __
At this lake __ __ __

(14.31) Swimming: Total __ __ __
At this lake __ __ __

(14.37) Hunting: Total __ __ __
At this lake __ __ __

(14.43) _____ Total __ __ __
(Specify)
At this lake __ __ __

(14.49) _____ Total __ __ __
(Specify)
At this lake __ __ __

ADMISSION FEE AND USER FEE DATA

__ (14.55) What is your thinking on paying a nominal fee (about $1.00 per car per day or an annual permit of $10.00 per year) for ADMISSION to the recreational areas around our lakes? It is assumed that any monies collected would be used to operate and maintain these recreational areas, including restroom cleanup and disposal of trash and garbage. (This fee would not pay for the use of a campsite).

1. Willing to pay such an admission fee
2. Object to paying such an admission fee

Reasons _____

_____

_____

__(14.56) (Only for those persons using FEE camping areas) What is your thinking on the camping fee you paid to use the camping site you are occupying?

1. Don't Mind Paying 2. Object to paying

__(14.57) Is the fee

1. Too high 2. About right 3. Too low

Comments _____

_____

_____

__(14.58) (Only for those persons using NONFEE camping areas) would you be willing to pay a nominal user fee ($2.00-$3.00 per night) for this campsite if this fee would be used for operation and maintenance of the facilities?

1. Yes 2. No

Comments _____

_____

_____

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SITE PREFERENCES AND OPINIONS

1 5 Card Number

__(15.07) Do you use this lake at least once each year? 1. Yes 2. No

Why did you select this LAKE for your recreation visit? (Circle Response)
__(15.08) 1. Close to home
__(15.09) 2. Visited this area before
__(15.10) 3. Recommended by friend
__(15.11) 4. Electric outlets
__(15.12) 5. Flush toilets
__(15.13) 6. Boat dock or marina
__(15.14) 7. Boat launching ramp
__(15.15) 8. Trailer dump station
__(15.16) 9. Attractive area
__(15.17)10. Nearby attractions
__(15.18)11. Ranger patrolled area
__(15.19)12. Other _____
(specify)

How did you first learn about the facilities at this site? (Circle Response)
__(15.20) 1. T.V. (Advertising, outdoor program, etc.)
__(15.21) 2. Radio (Advertising, outdoor program, etc.)
__(15.22) 3. Newspaper
__(15.23) 4. Travel Magazine
__(15.24) 5. Travel Association Directories
__(15.25) 6. Road Map
__(15.26) 7. Boat and Travel Show
__(15.27) 8. Relative
__(15.28) 9. Friend
__(15.29)10. Local Resident
__(15.30)11. Other_____
(specify)

What types of public facilities did you use at this recreational area during this trip. (Circle Response)
__(15.31) 1. Picnic table
__(15.32) 2. Grill
__(15.33) 3. Picnic shelter
__(15.34) 4. Trash barrel
__(15.35) 5. Toilet
__(15.36) 6. Shower
__(15.37) 7. Campsite
__(15.38) 8. Boat Launching ramp
__(15.39) 9. Nature trail
__(15.40)10. Drinking water
__(15.41)11. Electric hookups
__(15.42)12. Trailer sanitary station
__(15.43)13. Playground
__(15.44)14. Other_____

What would you like to see done to improve this recreation area? (More or Better)
__(15.45) 1. boat launching ramps
__(15.46) 2. camping sites
__(15.47) 3. swimming areas
__(15.48) 4. fish stocking
__(15.49) 5. access roads
__(15.50) 6. Flush toilets
__(15.51) 7. Showers
__(15.52) 8. Dump station
__(15.53) 9. Pull through sites
__(15.54)10. Drinking water
__(15.55)11. Electric hookups
__(15.56)12. Water hookups
__(15.57)13. None
__(15.58)14. Other_____

Which of the following do you consider to be problems at the lake site?
__(15.59) 1. Littering
__(15.60) 2. Insufficient trash collection and/or trash facilities
__(15.61) 3. Dirty toilet facilities
__(15.62) 4. Maintenance of grassed areas
__(15.63) 5. Noise problems due to land vehicles (ORV)
__(15.64) 6. Safety problems due to fast traffic
__(15.65) 7. Dust from roads
__(15.66) 8. Insufficient security patrol
__(15.67) 9. None
__(15.68)10. Other_____

__ __(15.69) From the list above, indicate the one problem you consider to be the most important.

__(15.71) Does the water level influence your use of the lake recreational facilities?
1. No influence on use
2. Decrease use when high
3. Increase use when high
4. Decrease use when low
5. Increase use when low
6. Decrease use when high or low
7. Increase use when high or low
8. Other _____

Which of the following do you consider to be problems related to water activities?
__(15.72) Noise Problems due to boats
__(15.73) Safety Problems due to speed of boats
__(15.74) Safety Problems due to operation of boats
__(15.75) Conflicts between different water activities
__(15.76) Other (Specify)_____
__(15.77) None
If checked 15.75, indicate what these conflicts are
_____
_____

General Comments _____
_____
_____

DDR/RWP/DFS/dm
7/21/75
200

SURVEY FORM APPROVED BY
OKLAHOMA AGRICULTURAL EXPERIMENT STATION
OKLAHOMA STATE UNIVERSITY
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May 1975

APPENDIX E

CONFIDENTIAL CONFIDENTIAL

1975 McCLELLAN-KERR ARKANSAS RIVER SYSTEM WATERBASED RECREATION SURVEY
SEASONAL AND PERMANENT HOME OWNERS
Department of Agricultural Economics
Oklahoma State University
Stillwater, Oklahoma 74074

Lake or L&D _____ Date _____ Interviewer _____

Section I. GENERAL INFORMATION

(1.01) Relation of respondent to head of household:

1. Same 2. Husband 3. Wife 4. Son 5. Daughter 6. Other _____ (Specify)

(1.02) Respondent:

1. Male 2. Female

(1.03) Age of respondent:

0. 15-19 2. 25-29 4. 35-39 6. 45-49 8. 55-64

1. 20-24 3. 30-34 5. 40-44 7. 50-54 9. 65+

(1.04) Marital Status:

1. Married 2. Single 3. Widow or Widower 4. Divorced

(1.05) Number of persons who still reside with you:

0 1 2 3 4 5 6 7 8 9+

(1.06) Age of persons indicated in (1.04) (Fill in number):

0. 0-5 _____ 2. 11-15 _____ 4. 20-24 _____ 6. 30-34 _____ 8. 40-49 _____

1. 6-10 _____ 3. 16-19 _____ 5. 25-29 _____ 7. 35-39 _____ 9. 50+ _____

(1.07) Occupation:

1. Professional
2. Manager; Administrator
3. Sales; Clerical
4. Craftsman
5. Laborer; Operatives
6. Service Worker
7. Farmer or farm worker
8. Retired
9. Not employed
10. Other _____ (specify)

(1.08) Average hours worked per week for head of household:

1. 0 2. 1-4 3. 5-9 4. 10-14 5. 15-19 6. 20-29 7. 30-40 8. 40+

(1.09) Education of head of household (years of schooling and/or highest degree).

1. 0-6 3. 12 5. 16 (BS or BA) 7. Ph.D. (MD)

2. 7-11 4. 13-15 6. M. S. 8. Technical

(1.10) Household income in 1973:

1. under $3,000 3. $5-6,999 5. $9-11,999 7. $15-19,999 9. $30,000+

2. $3-4,999 4. $7-8,999 6. $12-14,999 8. $20-29,999

(1.11) Is this a permanent residence or a seasonal home:

1. Permanent 2. Seasonal

IF PERMANENT RESIDENT, FILL OUT SECTION II; IF SEASONAL RESIDENT, GO TO SECTION III.

Section II: PERMANENT RESIDENT

(2.01) If persons who still reside with you attend school, where do they attend (Write in name of school)

1. _____ 2. _____ 3. _____

(2.02) Place of employment of head of household (Type of Business and Location):

_____

(2.03) Distance from residence to place of employment:

1. 0-4 mi.
2. 5-9 mi.
3. 10-14 mi.
4. 15-19 mi.
5. 20-24 mi.
6. 25-29 mi.
7. 30-34 mi.
8. 35-39 mi.
9. _____ if 40+ miles (write in actual)

(2.04) When did you move to your present residence:

1. less than 1 yr.
2. 1-2 yr.
3. 3-4 yr.
4. 5-9 yr.
5. 10-15 yr.
6. 16-20 yr.
7. 20 + yr.

(2.05) Why did you move to this location: _____

_____

(2.06) Hours per week you participate in lake related recreation (check for each season):

Hours	W	Sp	Su	F
1. 0-4	__	__	__	__
2. 5-9	__	__	__	__
3. 10-14	__	__	__	__
4. 15-19	__	__	__	__
5. 20-24	__	__	__	__
6. 25 +	__	__	__	__

(2.07) How many days of the week does this typically involve (check for each season):

	W	Sp	Su	F
No. of days	__	__	__	__

Section *III. SEASONAL RESIDENT*

(3.01) Do you use your seasonal home throughout the year:

1. yes 2. no

(3.02) If NO in (3.01), when do you usually open up your seasonal home:

1. Jan. 2. Feb. 3. Mar. 4. April 5. May 6. June 7. July
8. Aug. 9. Sept. 10. Oct. 11. Nov. 12. Dec.

(3.03) If NO in (3.01), when do you usually close up your seasonal home:

1. Jan. 2. Feb. 3. Mar. 4. April 5. May 6. June 7. July
8. Aug 9. Sept. 10. Oct. 11. Nov. 12. Dec.

(3.04) Approximately how many days did you actually use your seasonal home last year:

_____ days _____vacation days _____weekend days

(3.05) Is this the usual number of days you use your seasonal home each year:

1. yes 2. no

(3.06) *(Ask only if NO on (3.05) What is the usual number of days* you use your seasonal home per year: _____ days.

(3.07) Approximately how many days have you used your seasonal home so far this year:

_____ days

Section III. SEASONAL RESIDENT: (continued)

(3.08) Is this more or less than the usual number of days you planned to use your seasonal home:

1. more 2. less 3. right amount

(3.09) (Ask only if 1 or 2 is circled in (3.08) Reason for using seasonal home more or less: _____

_____

(3.10) Do friends or relatives use your seasonal home when you are not using it:

1. yes 2. no

(3.11) If YES in (3.10), how many days do they use your seasonal home and how many people are involved in a typical year:

_____ number of days _____ number of people

(3.12) Do you own this home as sole owner, or does someone else have an ownership interest in the seasonal home:

1. Sole owner 2. Someone else is part owner

(3.13) If others are part owners, how often do they use the seasonal home per year:

_____ number of days

(3.14) In (3.04) you indicated you used your seasonal home about _____ days last year. About how many round trips does this represent from and to your permanent address:

_____ trips

(3.15) Out of these trips, how many are strictly for recreation and how many are to travel to work or for other business reasons:

_____ trips for recreation

_____ trips for business

(3.16) Where is your permanent home:

_____	_____	_____	_____
city	county	state	zip

(3.17) One-way distance from your permanent home to seasonal home:

_____ miles

(3.18) In a typical week or weekend spent at your seasonal home about how many miles of local travel do you do (excluding travel from permanent residence):

1. _____ local miles per week 2. _____ local miles per
VACATION vacation WEEKEND weekend

(3.19) What are your average expenditures PER YEAR for TRANSPORTATION while using your seasonal home (include all costs getting to and from the seasonal home as well as local costs in recreation area):

TRANSPORTATION	Expenditure per year	% Purchased in region	% Purchased outside region
Gas and oil			
Auto or vehicle repair			
Vehicle rental			
Commercial fares (air, train, bus, etc.)			
Tolls for turnpike travel			
Other _____ (specify)			

Section III. SEASONAL RESIDENT: (continued)

(3.20) What are your average expenditures PER YEAR for FOOD and BEVERAGES while at your seasonal home:

FOOD AND BEVERAGES	Expenditures per year	% Purchased in Region	% Purchased outside Region
Purchased at permanent residence or brought from home			
Purchased at other stores (locally and enroute)			
Purchased in restaurants			
Charcoal			
Wood			
Lighter fluid			
Ice			
Other (specify _____)			
Other (specify _____)			

(3.21) What are your average expenditures PER MONTH for UTILITIES and SERVICES for your seasonal home:

	During Recreation Season		During Off Season	
UTILITIES & SERVICES	Expenditures per month	No. of months	Expenditure per month	No. of months
Electricity				
Natural Gas				
Propane Gas				
Telephone				
Garbage collection (private or public)				
Water				
Sewer				
Patrol				
Other (specify _____)				
Other (specify _____)				

Section IV. RECREATION PARTICIPATION

(4.01) How many days PER YEAR do you engage in various water and related land-based recreational activities: (Total at all lakes including this lake, and then at this lake only):

1. Boating: Total _____ At this lake _____
2. Fishing: Total _____ At this lake _____
3. Water-skiing: Total _____ At this lake _____
4. Camping: Total _____ At this lake _____
5. Swimming: Total _____ At this lake _____
6. Hunting: Total _____ At this lake _____
7. Other: _____ (specify activity and no. of days)

(4.02) How often do you have guests who stay with you in your home each year:

1. No. of days _____ 2. Average no. of guests per day _____

(4.03) Activities they participate in while visiting the lake:

1. Boating 2. Fishing 3. Skiing 4. Swimming 5. Camping 6. Picknicking 7. Hunting

Section IV. RECREATION PARTICIPATION: (continued)

(4.04) What are your ANNUAL average expenditures for Boating:

BOATING	Annual Average Expenditures	% Purchased in Region	% Purchased Outside Region
Boat and/or motor rental			
Boat gas & oil			
Boat launching and other user fees (excluding camping fees)			
Boat repairs			
Boat storage			
Insurance			
License & Registration Fees			
Lake Permit Fees			
Auxiliary accessories (lights, preservers)			
Other _____ (specify)			

(4.05) What are your ANNUAL average expenditures for Fishing:

FISHING	Annual Average Expenditures	% Purchased in Region	% Purchased Outside Region
Boat services (see BOATING)			
Rods and Reels			
Fishing equipment and supplies (tubes, waders, tackle, lures)			
Bait			
Fishing licenses			
Fishing guides			
Other _____ (specify)			

(4.06) What are your ANNUAL average expenditures for Waterskiing:

WATER SKIING	Annual Average Expenditures	% Purchased in Region	% Purchased Outside Region
Boat services (see BOATING)			
Water skis			
Ski belts (not preservers)			
Other _____ (specify)			

(4.07) What are your ANNUAL average expenditures for Camping:

CAMPING	Annual Average Expenditures	% Purchased in Region	% Purchased Outside Region
Camping equipment (lawn chairs, hammocks)			
Camping equipment maintenance repairs			
Camping fuels (Butane, etc.)			
Camping vehicle insurance			
Other _____ (specify)			

Section IV. RECREATION PARTICIPATION (continued)

(4.08) What are your ANNUAL average expenditures for Hunting:

HUNTING	Annual Average Expenditures	% Purchased in Region	% Purchased Outside Region
Guns and accessories			
Shells			
Hunting licenses			
Decoys			
Other _____ (specify)			

(4.09) What are your ANNUAL average expenditures for OTHER RECREATION activities, supplies and services for:

OTHER	Annual Average Expenditures	% Purchased in Region	% Purchased Outside Region
Amusement fees (putt-putt, golf, paddle boats, movies)			
Recreation equipment (such as golf clubs, archery, horse-shoes)			
Other (specify) _____			

(4.10) RECREATIONAL EQUIPMENT INVENTORY

	Item	Quantity	Year Purchased	City Where Purchased
(4.10)	Canoe (length _____)			
(4.11)	Boat (length _____)			
(4.12)	Motor (_____H.P.)			
(4.13)	Boat trailer			
(4.14)	Skiing Equipment			
(4.15)	Tent (Size _____)			
(4.16)	Camper Trailer (length _____)			
(4.17)	Tent Trailer (No. sleeps _____)			
(4.18)	Pick-up camper (% Rec. Use ____)			
(4.19)	Motor Home (length _____)			
(4.20)	Bicycles (Type _____ Speed ____)			
(4.21)	Minibikes (% rec. use _____)			
(4.22)	Motorcycles (% rec. use _____)			
(4.23)	Rods & Reels			
(4.24)	Guns (Gauge _____)			
(4.25)	Rifles (Caliber _____)			
(4.26)	Other _____			
(4.27)	Other _____			

Section V. FACILITIES DATA

(5.01) Type of structure for permanent lake residence or for seasonal home:

1. Wood 2. Stone or Brick 3. Concrete Block 4. Mobile Home
5. Other _____ (Specify)

(5.02) Age of home:

1. 0-2 years 3. 5-9 years 5. 15-19 years
2. 3-4 years 4. 10-14 years 6. 20 +

(5.03) Number of rooms in home:

1 2 3 4 5 6 7 8 9+

Section V. FACILITIES DATA: (Continued)

(5.04) Current market value of home: (without lot)

1. Under $5,000
2. $5-7,999
3. $8-9,999
4. $10-14,999
5. $15-19,999
6. $20-29,999
7. $30,000-39,999
8. $40,000+

(5.05) Current market value of lot: $ _____

(5.06) Size of lot:

_____ square feet or other measure _____
(specify)

(5.07) Are you the original owner of the lot:

1. yes 2. no 3. if yes, year purchased_____

(5.08) Are you the original owner of the home:

1. yes 2. no 3. If yes, when built or purchased _____

4. If no, when purchased _____

(5.09) If you are the original owner of the lot, what was the use of the land before you purchased it:

_____

(5.10) What is the travel distance from this home to the lake:

_____

(5.11) Water supply:

1. private water system
2. rural water district
3. own well
4. other

(5.12) Electric supply:

1. city _____ (Name)
2. REA _____ (Name)
3. Private Company _____ (Name)
4. Other _____

(5.13) Sewer system:

1. Septic tank 2. Lagoon 3. Sewer 4. Other _____

(5.14) Telephone service:

1. yes 2. no 3. Exchange or Company _____

(5.15) Gas supply:

1. Propane _____ (Company)
2. Natural gas _____ (Company)
3. None _____

(5.16) Have you had occasion to use the services of a law enforcement agency in conjunction with your property:

1. yes 2. no

(5.17) If Yes on (5.16) why:

1. Vandalism
2. Breaking & Entering
3. Burglarly
4. Arson
5. Neighborhood Disturbances
6. Other _____

Section V. FACILITIES DATA: (Continued)

(5.18) If Yes to (5.16) which agency was used:

1. County Sheriff 3. FBI

2. State Highway Patrol 4. Other _____

(5.19) Garbage removal:

1. Burn 2. Private Service 3. Take Home 4. Other

(5.20) Is fire protection available:

1. Yes 2. No.

(5.21) If Yes on (5.20) what type of fire service:

1. Community 2. Nearest City 3. Other _____

(5.22) Is road to property paved:

1. Yes 2. No.

(5.23) If Yes to (5.22) who paid for the paving:

1. Individual Owner 2. County 3. State 4. Developer 5. Other _____

Section VI. GENERAL:

(6.01) Has population in the immediate area of your property changed in the last 5 years:

1. No change 3. Increased 10-19% 5. Increased 30-49% 7. Declined

2. Increased 0-9% 4. Increased 20-29% 6. Increased 50% +

(6.02) Has the population change lowered the level of satisfaction derived from your property:

1. Yes 2. No.

(6.03) If Yes to (6.02), for what reasons:

1. _____

2. _____

3. _____

4. _____

(6.04) Do you have any problems with:

1. Ticks 2. Chiggers 3. Snakes 4. Other _____ 5. No problems

(6.05) Has the physical environment (setting or scenery) changed around the lake in the last 5 years:

1. Improved 2. Declined 3. No change

Comments: _____

_____

_____

(6.06) Have changes in the water level at this Lake influenced your use of the Lake recreational facilities:

1. Yes. 2. No 3. If yes, adversely 4. If yes, beneficially

Section VI. GENERAL:

(6.07) If yes in (6.06)

When _____ month & year

(6.08) If checked 3 or 4, in (6.06), what activities:

1. Boating 2. Fishing 3. Skiing 4. Camping 5. Picnicking 6. Other

(6.09) General Comments: _____

_____

_____

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