5-1970

A Comparative Analysis of Kentucky State Parks

Steven Foster
Western Kentucky University

Foster,

Steven C.

1970

A COMPARATIVE ANALYSIS OF KENTUCKY STATE PARKS

A Thesis

Presented to

the Faculty of the Department of Geography

Western Kentucky University

Bowling Green, Kentucky

In Partial Fulfillment

Of the Requirements for the Degree

Master of Science

by

Steven C. Foster

May 1970

A COMPARATIVE ANALYSIS OF

KENTUCKY STATE PARKS

APPROVED May 14, 1970:
(Date)

James L. Davis
Director of Thesis

David N. Goode

S. Reza Ahsan

John Dean Minton
Dean of the Graduate School

ACKNOWLEDGMENTS

The author wishes to express his gratitude to those who have given assistance and in any way helped to make this work possible. Special thanks are extended to Dr. Gerald H. Romsa and Dr. James L. Davis; Dr. Romsa for his information, suggestions as to field methods and frequent aid in quantitative application, and Dr. Davis for his guidance and critical assistance in preparation of the paper.

For supplying critical information and statistics, the author is grateful to Mr. Edward R. Chasteen of the Kentucky Department of Parks in Frankfort.

For an excellent job of typing this manuscript, the author wishes to thank his mother, Delora Foster.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ILLUSTRATIONS

CHAPTER I

INTRODUCTION

Outdoor recreation has become one of the major considerations of land utilization in the twentieth century. Although man has always found pleasure and relaxation in natural environments, it is only recently that the question of space adequacy has become a matter of concern. The complexities of urban living, with its tension-developing demands, has encouraged a popular turning to the out-of-doors for relaxing recreation. The demand for available areas of scenic beauty, places of wilderness quality, picnic and camping space, is being accelerated by growing population, increased leisure time, increased income, and greater mobility.

Predictions that our national population will double by the year 2000 have been cited by noted population specialists.[1] In addition, for a comprehension of the conservation need for outdoor recreation space, it is necessary to appreciate the trends in leisure time and personal income available for recreation. The increased use of machines powered by fuel has released many hours once needed to earn a living. Only a hundred years ago, the average worker was required to spend about seventy hours a week at his job. By 1920, the workweek was re-

---

[1] Irene Tacubor, Future Population Trends and Prospects (New York: United Nations Press, 1966), p. 191.

duced to fifty hours, in 1960, to forty hours, and many observers predict reduction to about thirty hours in the next decade. The resulting increased leisure time has been matched by a steady increase in disposable income of about 2 per cent per year, until most families have some income available for recreation.[2]

Another major factor is the increase in paid vacation. In the period of the 1920's, census data revealed that workers received about sixteen and a half million weeks of paid vacations, or two days per worker. In 1960, the estimate was seventy-five to eighty-five million weeks of paid vacation, or at least seven working days per worker. Nearly all workers now have two and three weeks of paid vacation annually.[3] In the home, labor saving devices have freed the family for week day and weekend trips. Even farm families participate in recreational trips to parks and beaches as never before.

The result of this leisure time, greater income, and the growing use of the automobile is a tremendous increase in pressure on outdoor recreation space. In the last decade, visits to recreational areas of all sorts have increased by an average of 10 per cent annually, and evidence points to a continuation of the trend.[4]

That outdoor recreation facilities are desirable and

---

[2]William Peterson, Population (New York: Macmillan Book Co., 1969), pp. 126-127.

[3]Ibid., p. 131.

[4]M. Clawson, R. B. Held, and C. H. Stoddard, Land for the Future (Baltimore: The Johns Hopkins Press, 1962), p.3.

necessary is obvious, but how much space is required? How much and where should it be conserved? These questions are not easy to answer. There are many problems, data are sketchy and not reliable, and the psychology of outdoor recreation is not fully understood. Not the least of the problems is the conflicting land-use question. To what extent can recreation be provided for as part of multiple use on land primarily dedicated to commodity or other economic production? How much space needs to be dedicated to recreation as the primary use? It is obvious that there is need for greater provision for recreational land use than at present. It is equally clear that conservation of open space and recreational land resource involves difficult problems in resolving claims of competing land use.

At present there are about 3.5 acres per capita devoted to outdoor recreation. Estimates suggest total visits of about 1.5 billion or a per capita average of nearly ten visits annually to some outdoor recreation areas.[5] Obviously the pressures on the resource vary greatly in proportion to proximity to dense populations and, of course, some people never participate while others make numerous visits.

One must conclude that the pressure on the nation's space available for outdoor recreation will mount with increasing intensity as more and more people with leisure time, money, and transportation turn to the out-of-doors for day, weekend, and multiple-day vacations. To meet the projected

---

[5] Ibid., p. 7.

needs of the future, as they are understood from past experience and current implications, conservation of suitable space in ample amount, quality, and variety must be made now for citizens of the future. Especially notable is the suggestion that by 1985 visits to national level areas will increase thirty-fold and to state parks and reservoirs elevenfold.[6] To meet the projected demand, major additions are considered needed in national as well as state parks.

As stated above, the projection of demand for state and other regional recreation facilities is for an eleven fold increase, and thus there needs to be a proportional expansion of the facilities area. The conclusion to be drawn is that every state needs to begin now to take inventory of its recreational resources and acquire and protect the most suitable areas before conflicting developments prevent or make difficult and costly the provision of adequate recreational space for the future.

Statement of Problem

This study is a survey of the Kentucky State Park system as it exists today (Figure 1). Investigations were directed primarily to factors which influence attendance at Kentucky's parks and to the development of a formula for use in determining possible expansion rates for these parks. As has been pointed out in the previous paragraphs, every state needs to take steps toward improvement of recreational fac-

---

[6] R. Highsmith, J. G. Jensen, and R. D. Rudd, Conservation in the United States (Chicago: Rand McNally and Co., 1962), p. 184.

LIST OF PARKS CORRESPONDING TO FIGURE 1

1. Buckhorn Lake
2. Carter Caves
3. Cumberland Falls
4. General Butler
5. Jenny Wiley
6. Kenlake
7. Kentucky Dam Village
8. Lake Cumberland
9. Natural Bridge
10. Pennyrile
11. Pine Mountain
12. Rough River
13. Barren River
14. Big Bone Lick
15. Blue Licks
16. Columbus Belmont
17. Falmouth Lake
18. Fort Boonesboro
19. General Burnside
20. Greenbo Lake
21. John James Audubon
22. Kingdom Come
23. Lake Barkley
24. Lake Malone
25. Levi Jackson
26. Lincoln Homestead
27. My Old Kentucky Home
28. Old Fort Harrod

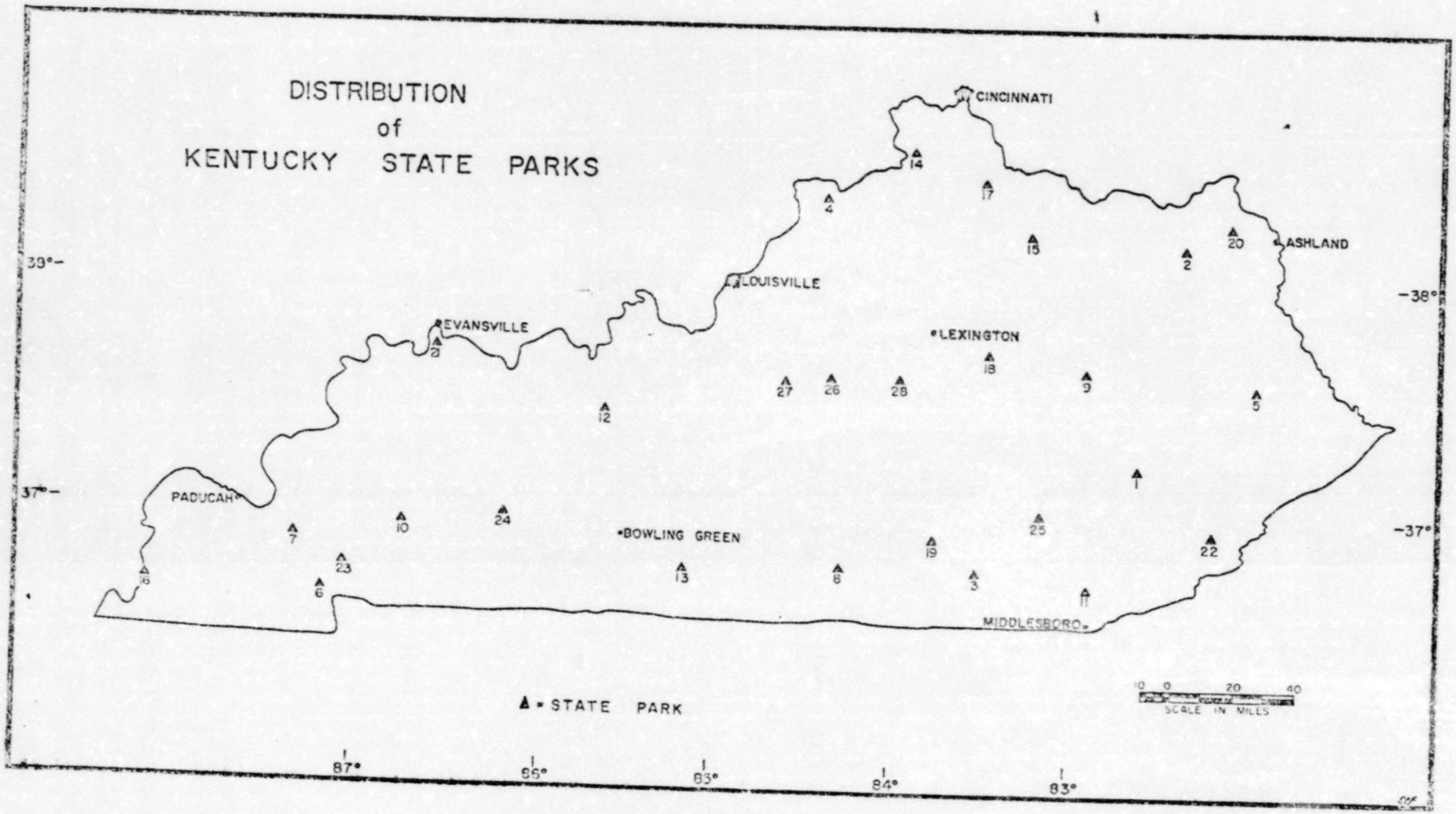

DISTRIBUTION
of
KENTUCKY STATE PARKS
CINCINNATI
ASHLAND
LOUISVILLE
EVANSVILLE
LEXINGTON
PADUCAH
BOWLING GREEN
MIDDLESBORO
39°
38°
37°
87°
86°
85°
84°
83°
▲ = STATE PARK
10 0 20 40
SCALE IN MILES

Figure 1

ilities. Kentucky's leaders realize that this problem exists and have worked diligently to make the state's park facilities some of the best in the nation. In a comparison made by the Kentucky Department of Parks, it was noted that Kentucky parks are superior to and attract more visitors than many of the facilities of adjoining states.[7] For this reason, the author has taken an interest in determining the factors which influence attendance rates and how these rates would change if the parks were improved or further developed. The results of this study will help to establish reasons for differences in attendance at parks in Kentucky, and will provide methods for determining future areas of expansion and improvement.

Review of Literature

Among the earliest writings dealing with recreation geography in the United States is a study made by K. C. McMurry, published in 1930, discussing the importance of land use in Northern Michigan in connection with some work done by the Michigan Land Economic Survey.[8] McMurry pointed out the types of land useful to fishermen and hunters, stressed some contributions that geographers might make to this field, and indicated some of the tools of recreational research. In 1935 Robert M. Brown surveyed the general field of recreational

---

[7]Kentucky Department of Publication Information, Kentucky State Parks: A General Study (Frankfort: Kentucky Printing Office, 1964). pp. A-J.

[8]K. C. McMurry, "The Use of Land for Recreation," Annals of the Association of American Geographers, XX (March, 1930), pp. 7-20.

geography.[9] Brown's work dealt mainly with the phenomena of tourism and pointed out several techniques for measuring its magnitude, patterns and economic value.

Following McMurry's work there were several studies which pointed out the general character of recreation, its forms, and its economic importance as related to a given area of the United States. These studies included investigations made by E. C. Prophet and G. F. Deasy in Michigan counties,[10, 11] R. B. Greely in New England,[12] and by Clifford M. Zierer in the Western United States.[13]

One of the first attempts to survey recreation systematically was made by W. O. Hendrick in 1934.[14] This study was based primarily on returns received from questionnaires sent to township assessors in Michigan. From these returns, Hendrick produced maps of various recreational patterns and des-

---

[9]R. M. Brown, "The Business of Recreation," Geographical Review, XXV (November, 1935), pp. 467-475.

[10]E. C. Prophet, "The Tourist and Resort Industry," Papers of the Michigan Academy of Science, Arts and Letters, XX (1936), pp. 385-395.

[11]G. F. Deasy, "The Tourist Industry of a 'North Woods' County," Economic Geography, XXV (October, 1949), pp. 240-249.

[12]R. B. Greely, "Part-time Farming and Recreational Land Use in New England," Economic Geography, XVIII (June, 1942), pp. 145-152.

[13]C. M. Zierer, "Tourism and Recreation in the West," Geographical Review, XLII (November, 1952) pp. 462-481.

[14]W. O. Hendrick, "Recreational Use of Northern Michigan Cut-over Lands," Agricultural Experiment Station, Michigan State College, Special Bulletin 247 (East Lansing, Michigan, 1934).

cribed the environmental features that seemed significant in their distributions. He also isolated the taxes paid to local government units by owners of recreational property.

Between 1947 and 1951 several attempts were made by state agencies to identify recreational-travel patterns and expenditures in the States.[15,16] These were based on questionnaires filled out by tourists who stated origins, routes, and destinations of their travels, the types of accommodations they used, and expenditures they made. This group of studies has been beneficial in helpin to outline the patterns of tourist travel, identifying facilities used, and appraising expenditures.

A second type of recreational investigation was begun in 1933 by Stephen B. Jones.[17] The fundamental here was the character and distribution of the phenomena connected with recreational land use. To do this, Jones compared the features of tourist towns with those of mining towns in British Columbia and defined recreation regions in the Canadian Rockies. Another study in this direction was made in 1948 by A.W. Booth which analyzed the lake-shore characteristics and the nature of the lakes themselves in terms of recreation value in the

---

[15]G. H. Stedman, "Business Aspects of Vacation Travel," New York State Commerce Review, I (1947), pp. 7-13.

[16]V. H. Lanning, The Wisconsin Tourist, I (Madison, 1950), pp. 60-75.

[17]Stephen B. Jones, "Mining and Tourist Towns in the Canadian Rockies," Economic Geography, IX (October, 1933), pp. 368-378.

state of Washington.[18] Booth's study made a contribution to recreational studies by providing sound techniques in mapping. In 1951, R.I. Wolfe studied the source areas of occupants of summer cottages in Ontario, using home addresses secured from local postmasters.[19]

One of the most comprehensive studies of recreational values and distributions within a state was published by A.S. Carlson in 1938.[20] His study dealt with the recreational features in six districts of the state of New Hampshire. Based on field interviews, the study was centered around tax rolls in the recreation districts, financial contributions of recreational property, locations and classifications of facilities, and expenditures within these areas.

The establishment in the United States in 195? of Resources for the Future, Inc., a nonprofit research organization, was the turning point in the history of recreational studies. Since 1957, a score of publications having some relevance to outdoor recreation having emanated from this organization. The most prominant name associated with the organization is Marion Clawson, who is considered by many critics to be the foremost authority in the field of recreation. Many

---

[18] A. W. Booth, "The Lakes of the Northeastern Inland Empire: A Study of Recreational Sites," Bureau of Economics and Research, V (Pullman, 1948), pp. 23-31.

[19] R. I Wolfe, "Summer Cottages in Ontario," Economic Geography, XXVII (January, 1951), pp. 10-32.

[20] A. S. Carlson, "Recreational Industry of New Hampshire," Economic Geography, XIV (July, 1937), pp. 255-270.

of his works, such as his book dealing with methods of measuring the demand for outdoor recreation, have been influential in helping researchers complete various studies on the demands for outdoor recreation.[21]

In 1961, a conference similar in ideas to Resources for the Future was held in Ottawa, Canada. This conference on "Resources for Tomorrow" was instrumental in bringing together ideas on recreation collected by geographers, forest managers, and wildlife management specialists. The Resources for Tomorrow Conference was a high point for the study of recreation in Canada. A similar high point in the United States was completed in 1962 by the Outdoor Recreation Resources Review Commission (ORRRC) in a report on "Outdoor Recreation for America."[22]

The ORRRC was established by Congress in 1958 to determine the outdoor recreation wants and needs of the American people now and what they will be in the years 1976 and 2000. Some of the other reports from this commission deal with people, some with the physical environment, and others with economic or social theory. These reports present an altogether new picture of many aspects of life in America. Geographers, however, will find gaps in them such as the Commission's lack in providing good cartographic work, and hopefully, will want to

---

[21]Marion Clawson, Methods of Measuring the Demand for and Value of Outdoor Recreation (Baltimore: The Johns Hopkins Press, 1959).

[22]Outdoor Recreation for America: A Report to the President and to the Congress by the Outdoor Recreation Resources Review Commission (Washington, 1962).

do something about filling them.

Several important studies have developed from ideas left vacant by the ORRRC. One of the more prominent studies deals with a comparative perspective on outdoor recreation done by R.I. Wolfe in 1964.[23] This work surveys the publications of the ORRRC and supplies geographers with a review of each of these separate studies. Earlier, Jack L. Knetsch tried to determine outdoor recreation demands and how these demands were being dealth with.[24]

The theme of recreational studies turned to traffic flow and traffic patterns in 1966. Ellis and Van Doren conducted several studies dealing with gravity models and traffic flows.[25]

More recently studies have been centered around recreational boating. Lentnic, Van Doren, and Trail conducted a survey of Ohio recreational boating in 1969 and concluded that this facet of outdoor recreation is only a small part of the total picture.[26]

One of the most helpful studies concerning recreation

---

[23]R. I. Wolfe, "Perspective on Outdoor Recreation," The Geographical Review, LIV (October, 1964), pp. 302-335.

[24]Jack L. Knetsch, "Outdoor Recreation Demands," Land Economics, XXXIX (November, 1963), pp. 387-396.

[25]Jack B. Ellis and Carlton S. Van Doren, "A Comparative Evaluation of Gravity and System Theory Models for Statewide Recreational Traffic Flows," Journal of Regional Science, VI (February, 1966), pp. 57-66.

[26]Barry Lentnik, Carlton S. Van Doren and James R. Trail, "Spatial Behavior in Recreational Boating," Journal of Leisure Research, I (Spring, 1969), pp. 103-124

was completed by Frank J. Cesario in 1969.[27] This work presented various quantitative approaches for the study of recreation and was influential in setting the foundation for the chapters that follow.

As can be seen from the development of recreational studies, this field has expanded tremendously in the last two decades. With this expansion, Kentucky has also been able to develop recreational-wise; however, little work has been done to evaluate the growth of recreation in the state. Due to this deficit in recreation investigations, this study is among the initial efforts to analyze the growth of recreation in the state.

---

[27] Frank J. Cesario, "Operations Research in Outdoor Recreation," Journal of Leisure Research, I (Winter, 1969), pp. 33-51.

CHAPTER II

GENERAL INFORMATION ON KENTUCKY STATE PARKS

Historical Development[1]

Kentucky's parks as they exist today are the result of almost 50 years of effort on the part of broad minded and farsighted individuals and groups. In 1924, Dr. Willard Jillson, State Geologist and later Director of Parks, was rejected in his attempt to establish a state park in the Cumberland Gap area. Citizens in nearby Pineville became enthusiastic about the park, however, and several hundred acres of rugged Cumberland Mountain land were acquired and named Cumberland State Park. The 1926 Kentucky General Assembly formally designated it as Kentucky's first state park. The name was changed later to Pine Mountain State Park to avoid conflict when Cumberland Falls State Park was established. Little more was done in the way of improvement at this park until the advent of the Federal Civilian Conservation Corps in the late 1930's, when this agency spent two million dollars in the Pine Mountain area on roads, a lodge, cabins, picnic shelters, and a natural rock amphitheater.

Cumberland Falls, one of Kentucky's most outstanding beauty spots, was early a scene of conflict in the classic

---

[1]Kentucky Department of Public Information, op. cit., pp. A-D.

struggle between conservationists and power developers. In 1922, the Insull Utility interests acquired land in the Cumberland Falls area and planned to erect a dam above the falls and a power plant below. The company also planned a carnival-style park to be built with the project. While the above was being planned, Coleman duPont, a Louisville industrialist, offered the state 200,000 dollars to purchase the land around the Falls for a state park. During the same period, the Kentucky State Park Commission was established under the leadership of Tom Wallace, a conservationist and editor of The Louisville Times. The Commission, backed by a few state and national groups, joined the fight for Cumberland Falls and the battle to preserve this beautiful spot was on.

After sustaining a defeat in the 1928 Legislature and a stand-off with the Federal Power Commission in 1929, the Commission finally succeeded in 1930 in getting the Kentucky Legislature to pass a bill establishing the park at Cumberland Falls, over the veto of Governor Sampson. DuPont Lodge and a plaque in Cumberland Falls State Park honor native son Coleman duPont for his foresight and generosity.

During its early years, the parks system was limited in funds and personnel. By 1947, however, the state held title to twelve parks. In 1948, Governor Earle C. Clements appointed parks-minded Henry Ward as Commissioner of Conservation. From 1948 to 1955 Ward demonstrated that development and management of a state parks system could be a great stimulus to the tourist industry. During this period, Kentucky Dam Village, Kenlake,

Lake Cumberland, and Jenny Wiley became permanent state parks and a long range development program was initiated. Substantial improvement in existing parks was made, with emphasis being placed on building cottages and developing recreation facilities. Under Ward, Kentucky invested 8.3 million dollars in park development.

From 1955 to 1959, the state spent only 500,000 dollars on park development, and by 1959 the parks system needed a complete rejuvination. Entering office in December 1959, Governor Bert Combs resolved to develop for Kentucky the tools to build a major tourist industry. Upgrading and improving the parks was considered a key factor in Kentucky's new effort to attract more tourists. The parks expansion and development program was undertaken, financed by 20 million dollars raised from bond issues. A three-man blue-ribbon citizens' board was named to plan the parks system. Major projects were undertaken in twenty-one state parks, including the addition of five new parks to the system, and a Department of Parks with its own commissioner was created.

In 1962, Kentucky dedicated seven new state park lodges with 237 guest rooms and dining accommodations for 1,500. Private developers from 1959 through 1961 built new motel rooms throughout the state, which were leased to the state. The Kentucky Lake area had over 5,000 rental units for use by the vacationing public by 1964. During the administration of Governor Edward T. Breathitt, 3 million dollars in additional bond money was used to further develop the parks. In 1964, two more

luxury lodges and other accommodations were dedicated. Plans were also announced to build two additional resort parks, one on the east shore of Lake Barkley, the other on Barren River Reservoir. Both of these parks were opened in 1967. Their addition to the park system brought the total number of parks to twenty-eight, the number presently open in the state.

Recent Park Statistics

In 1968, Kentucky's twenty-eight parks attracted a total of 19,404,082 visitors (Figure 2). The total land in the park system was 28,847 acres (Figure 3), with available water totalling 255,709 acres (Figure 9). The number of campsites totalled 1,752, with four parks offering primitive camping (Figure 5). Twelve parks had lodge facilities, ten had cottages ranging from one to three bedrooms, thirteen had swimming pools, and twenty-four offered picnic facilities.[2]

Description of Present Parks

Twelve parks are classified as vacation resort parks, which means they have facilities including excellent overnight lodging, complete dining room service, and a broad range of recreational features. Seven parks are listed as general activity parks. These parks have facilities centered around camping and nature seeking recreation. Listed under a third category, historical, are seven additional parks. They are classified as such because they have outstanding attractions

---

[2]Kentucky State Department of Parks, Census Statistics Concerning State Parks (Frankfort: Kentucky Printing Office, 1968).

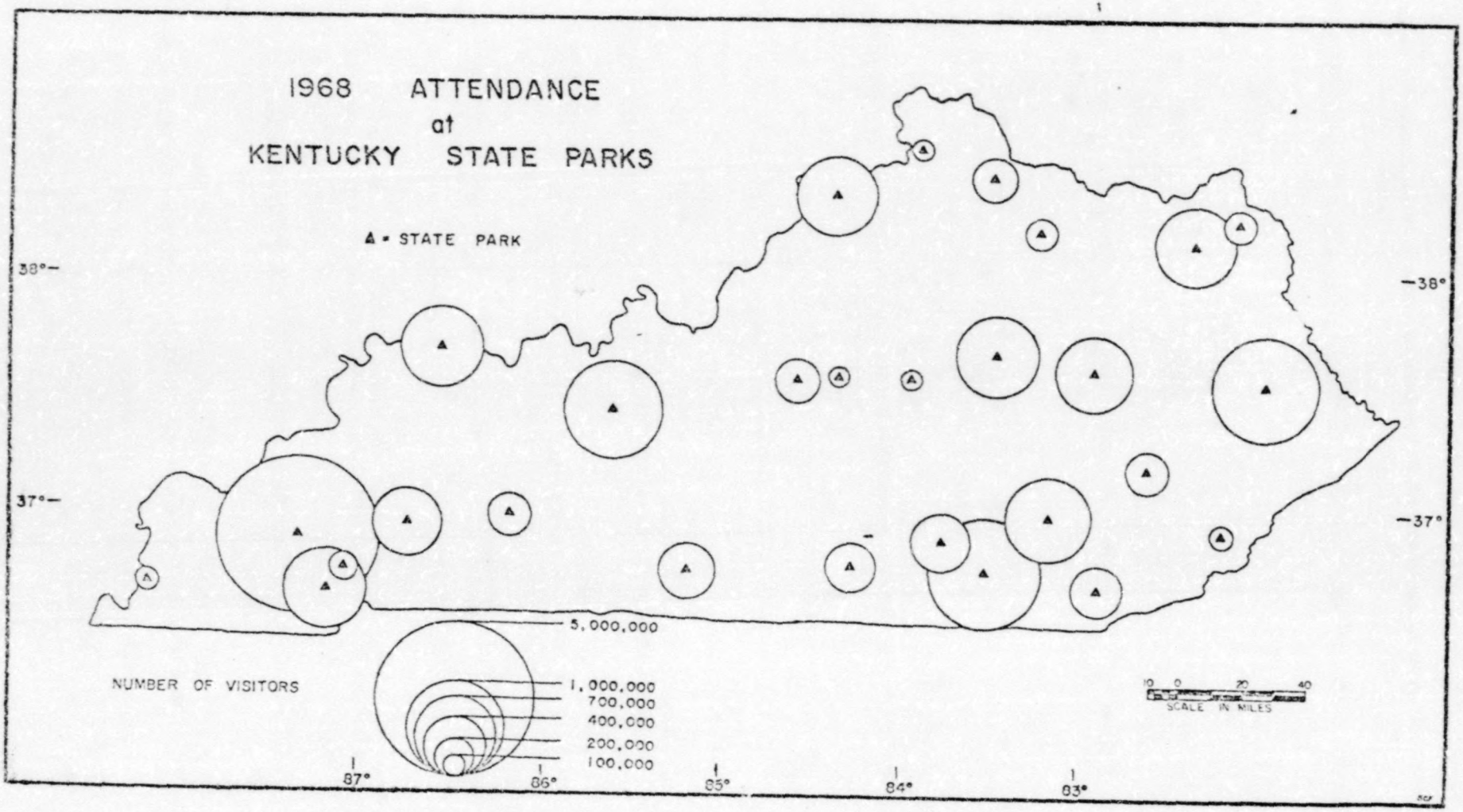

1968 ATTENDANCE
at
KENTUCKY STATE PARKS
▲ = STATE PARK
38°
37°
38°
37°
5,000,000
NUMBER OF VISITORS
1,000,000
700,000
400,000
200,000
100,000
10 0 20 40
SCALE IN MILES
87°
86°
85°
84°
83°

Figure 2

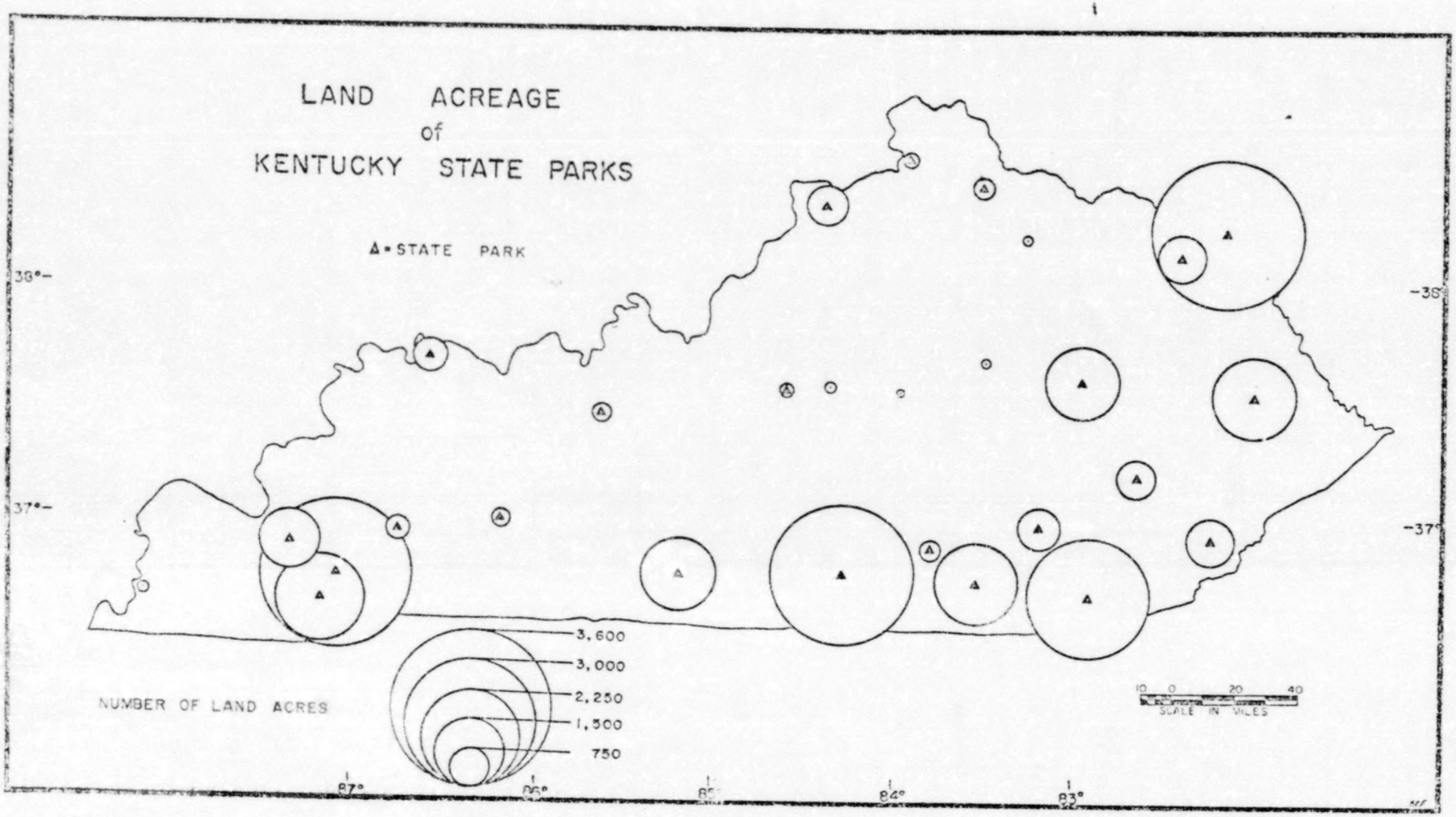

LAND ACREAGE
of
KENTUCKY STATE PARKS
▲ = STATE PARK
38°
37°
3,600
3,000
2,250
1,500
750
NUMBER OF LAND ACRES
10 0 20 40
SCALE IN MILES
87°
86°
85°
84°
83°

Figure 3

which display significant periods in the history of Kentucky. Only two parks are considered to be wilderness areas. These parks are the best areas in the state for primitive camping. In the sections that follow, a brief description of each park has been presented which will be helpful in understanding the comparisons made in Chapters III and IV.

Resort Parks

1. Buckhorn Lake State Park. This park is located in Eastern Kentucky on Kentucky 28, 25 miles west of Hazard. This park has a lodge, dining room, 1,200 acre lake, beach bathhouse, sandwich shop, boat dock and launching ramp, boat rentals, 26 tent camping sites, picnic shelter with rest rooms, and a playground. The average annual attendance here is 233,937.

2. Carter Caves State Park. Located 6 miles east of Olive Hill in Northeastern Kentucky on Kentucky 182 off U.S. 60, this park offers recreation and relaxation on land and water, with guided tours underground in the cavern country of Kentucky's picturesque eastern mountains. The park has a resort lodge, resort pool, coffee shop, one-bedroom cottages, 82 tent and trailer campsites, bathhouse, beach, 45 acre lake, boat dock and boat rentals, 9-hole golf course and riding stable. The park's annual attendance is 648,072.

3. Cumberland Falls State Park. Cumberland Falls, "The Niagara of the South," is the center of attraction in the Daniel Boone National Forest. It is located in Southeastern Kentucky on Kentucky 90 off U.S. 27 on U.S. 25-W, 19 miles

southwest of Corbin. The park has a lodge and lodge pool, dining room, coffee shop, gift shop, beach, bathhouse and river swimming, grocery, one and two-bedroom cottages, 73 tent and trailer campsites with two service buildings, picnicking, horseback riding, hiking and nature trails, square-dance pavilion, and playgrounds with supervised recreation. Cumberland Falls is the second largest falls east of the Mississippi, and is one of the world's two moonbow sites. The average annual attendance of 1,515,638 is evidence of the tremendous attraction to this park.

4. General Butler State Park. This park is located 5 miles west of Carrolton and 50 miles northeast of Louisville in North-central Kentucky on Kentucky 227 off U.S. 42 and is situated on the 800-acre estate of a famous Kentucky general. The park has a resort lodge, resort pool, dining room, sandwich shop, grocery, one and three-bedroom cottages, 154 tent and trailer campsites with a central service building, picnicking, 25-acre lake, bathhouse, beach and lake swimming, boat dock and boat rentals, horseback riding, 9-hole golf course, hiking and nature trails, playgrounds, and an airstrip. The Butler mansion contains a museum of Ohio River lore, with visual interpretations of the riverboat era. The park's average annual attendance is 702,774.

5. Jenny Wiley State Park. Named in honor of the young woman Jenny Wiley because of her bravery when captured by Cherokee Indians, this park is located 5 miles north of Prestonsburg

in Eastern Kentucky on Kentucky 304 off U.S. 23 and 460. With an average attendance of 1,171,861, the park has a lodge and lodge pool, dining room and gift shop, one and two-bedroom cottages, 105 tent and trailer campsites, boat docks, boat rentals and launching ramp, swimming, picnic shelter with rest rooms, 9-hole golf course, horseback riding, fishing, hiking trails, and playgrounds with planned recreation. 1,150 acre Dewey Lake is the central attraction and has excellent fishing, especially for bass. A 12,000-acre forest in the eastern Kentucky mountains provides an exceptional surrounding.

6. Kenlake State Park. Located 5 miles south of Aurora on Kentucky 94 and 41 miles southeast of Paducah, Kenlake State Park attracts an average of 353,045 visitors annually. The park has a resort hotel, swimming pool, dining room, gift shop, one and two-bedroom cottages, 120 tent and trailer campsites, beach and lake swimming, boat docks, boat rentals and a launching ramp, sailboating and sailboat launching boom, 9-hole golf course, horseback riding, picnic shelter with rest rooms, airstrip, playground, and amphitheater. The park is situated on the west shore of 128,300-acre Kentucky Lake, which is the home of the Governor's Cup Regatta, held each year in late May, and the Watkin's Cup Regatta, held annually in early October.

7. Kentucky Dam Village State Park. Located 5 miles west of Gilbertsville in Western Kentucky off U.S. 62 and U.S. 641,

Kentucky Dam Village has the highest attendance in the park system, with annual rates of over 5,490,000. The park has a resort inn, two lodges, resort pool, dining room, coffee shop, gift shop, two and three-bedroom cottages, two and three-bedroom deluxe cottages, 200 tent and trailer campsites with three central service buildings, bathhouse, sand beach and lake swimming, boating and rentals from two boat docks, fishing boat and ski-boat rentals, launching ramps, 18-hole golf course, golf-car rentals, horseback riding, playground and planned recreation, grocery, lake cruises, and an airstrip. Situated on the northern end of Kentucky Lake, near Kentucky Dam, the park is the most widely diversified in the state.

8. Lake Cumberland State Park. This park is situated on 50,250-acre Lake Cumberland in South Central Kentucky, 4 miles south of Jamestown on U.S. 119. It is one of the larger parks in acreage, with an average attendance of 437,667. Existing facilities consist of a resort lodge, dining room, coffee shop, olympic pool, one and two-bedroom cottages, two-bedroom deluxe cottages, grocery, 145 tent and trailer campsites with a central service building, picnicking, boating, boat rentals, a launching ramp, par-3 golf course, horseback riding, hiking and nature trails, fishing, and playgrounds with supervised recreation. Lake Cumberland offers spectacular scenery along its 1,255-mile shoreline, and in this lake which averages 90 feet in depth, the fish-per-acre ratio is superior. The average annual attendance is 662,786.

9. Natural Bridge State Park. Natural Bridge, sometimes considered "The Eighth Wonder of the World," is located 3 miles south of Slade in Eastern Kentucky on Kentucky 77. The park has a lodge, olympic pool, dining room, gift shop, one-bedroom cottages, 77 tent and trailer campsites with a central service building, horseback riding, hiking and nature trails, fishing, and a playground with supervised recreation. Located in the Cumberland National Forest, this Red River Valley area abounds in high stone cliffs, unique rock formations, deep valleys, mountain streams, and a profuse forest and wildflower covering. There are twelve great natural bridges in the area. Natural Bridge is the largest; its arch is 78 feet long and 65 feet high.

10. Pennyrile Forest State Park. This park is surrounded by a 15,000-acre forest and attracts 551,545 visitors annually. The park is located 4 miles south of Dawson Springs in Western Kentucky on Kentucky 109 off U.S. 62 and the Western Kentucky Parkway. The park has a lodge, dining room, gift shop, lodge pool, bathhouse, sand beach and lake swimming, one and two-bedroom cottages, 65 tent and trailer campsites with a central service building, picnicking, boating and boat rentals, 9-hole golf course, horseback riding, hiking and nature trails, and playgrounds with planned recreation. A 55-acre lake is in the park and 850-acre Lake Beshear is nearby.

11. Pine Mountain State Park. Located one mile south of Pineville in Southeastern Kentucky on U.S. 25-E. This park is situated in one of the higher regions of the state. The park has

a resort lodge, resort pool, dining room, gift shop, one and two-bedroom cottages, 32 tent and trailer campsites with a central service building, 50-acre lake, picnic shelter with rest rooms, boating and boat rentals, 9-hole golf course, horseback riding, hiking and nature trails, playground, and a planned recreation program. The park is located in Kentucky Ridge State Forest, and every tree known to the Appalachian region grows here. The Mountain Laurel Festival is held the last weekend in May, and the Park's Laurel Cove Amphitheater is where the Mountain Laurel Queen is crowned. These facilities attract 304,986 visitors annually.

12. Rough River Dam State Park. Rough River Dam State Park is located 65 miles southwest of Louisville in West-central Kentucky on Kentucky 105 off U.S. 60. The park has a resort lodge, resort pool, dining room, gift shop, two-bedroom deluxe cottages, 4,830-acre lake, bathhouse, sand beach and lake swimming, boat dock, boat rentals and launching ramp, 50 tent and trailer campsites, picnicking, airstrip, and playgrounds. The park has excellent fishing, and because the Ohio and Wabash flyways are near here, there is an abundance of waterfowl. These facilities attract 1,287,287 annual visitors.

General Activity Parks

13. Barren River Reservoir State Park. This park is located 20 miles south of Glasgow on U.S. 31-E and is one of the newer parks in the state system. Park facilities consist of 111 campsites, a boat dock, and picnic facilities. The park's location

on the 10,000-acre Barren River Reservoir helps to attract an average of 334,170 visitors annually.

14. Big Bone Lick State Park. One of the less frequented parks, Big Bone Lick is located in Northern Kentucky 15 miles south of Covington on Kentucky 338 off U.S. 42, U.S. 127, and I-75. The Park's facilities consist of a 7-acre lake, 35 campsites, and a picnic area. The average annual attendance is 132,465 visitors.

17. Falmouth Lake State Park. Falmouth Lake is located 40 miles south of Covington in Northern Kentucky on Kentucky 159 off U.S. 27. The park's facilities are centered around a 175-acre lake and consist of a beach for swimming, 35 campsites, a boat dock, bathhouse, and picnic area. The average annual attendance here is 208,627.

19. General Burnside Island State Park. Located 8 miles south of Somerset in South-central Kentucky on Kentucky 159 off U.S. 27, Burnside Island is situated on 50,000-acre Lake Cumberland. With park facilities consisting of a beach, a 9-hole par-3 golf course, 108 tent and trailer campsites, boat dock, central service building, and boat rentals, the park averages 466,946 visitors annually.

20. Greenbo Lake State Park. Just 16 miles west of Ashland in Northeastern Kentucky on Kentucky 1 off U.S. 23, Greenbo Lake State Park attracts an average of 294,348 visitors annually. The park has a 225-acre lake, beach, 74 tent and trailer camp-

sites, boat dock, picnic facilities, bathhouse, central service building, coffee shop, grocery, boat dock, boat rentals and launching ramp, and a playground. A primitive iron ore smelter is in the park and plans are under way to reproduce blast furnaces and buildings to simulate the 19th-century appearance of the area.

23. Lake Barkley State Park. Lake Barkley State Park is the largest park in acreage in the state, 3,600-acres. Its location 2 miles north of Canton in Western Kentucky on Kentucky 80, and its limited facilities, both contribute to a low average annual attendance of 153,551 visitors. The lack of a lodge is probably the greatest limiting factor. Facilities in the park consist of two beaches, 150 tent and trailer campsites, and two boat docks. It is situated on 128,300-acre Lake Barkley.

24. Lake Malone State Park. Lake Malone is located 3 miles west of Dunmore in Western Kentucky on Kentucky 973. The park has an average annual attendance of 201,379 visitors and its facilities consist of a 788-acre lake, beach, boat dock, 24 tent campsites, picnic facilities, and a central service building.

Historical Parks

15. Blue Licks Battlefield State Park. Located 20 miles south of Mt. Olivet in North-central Kentucky and 42 miles northeast of Lexington on U.S. 68, Blue Licks is another of the less frequented parks with an average annual attendance of 198,407. The park's facilities consist of a swimming pool, museum, 10

campsites, picnic shelter, bathhouse, playground, and hiking trails. Here the last battle of the American Revolution, and the last major Indian-Pioneer struggles in Kentucky were fought.

16. Columbus Belmont Battlefield State Park. Columbus Belmont is located 50 miles southwest of Paducah in the extreme western part of Kentucky on Kentucky 80 off U.S. 51. Due to limited facilities of 15 campsites, a small museum, and a picnic area, the park attracts only 131,027 visitors annually with attendance rates dropping yearly. Civil War fortifications and a six-ton anchor with chain, used by the Confederates to block river traffic, are part of the exhibits in the park. An excellent view of the Mississippi River and its bluffs are also attractions.

18. Fort Boonesboro State Park. Fort Boonesboro, being one of the better historic attractions, is located 8 miles south of Winchester, Kentucky, on U.S. 227 just three miles from Interstate 75. Due in part to this location, the park has an average annual attendance of 689,241. The park facilities consist of a swimming area, a museum, 55 tent and trailer campsites, picnic areas, playgrounds, coffee shop, beach, and a central service building.

21. John James Audubon State Park. Just 2 miles northeast of Henderson in Northwestern Kentucky on U.S. 41, this park has an average annual attendance of 610,897. The park has a gift shop, one-bedroom cottages, 54 tent and trailer campsites with

a central service building, 20-acre lake, bathhouse, beach, lake swimming, boating and boat rentals, picnicking, playground, hiking and nature trails, and fishing. Two museums, John James Audubon Memorial Museum and a gray stone French Provincial building, contain one of the greatest public exhibits of original prints from Audubon's bird paintings and personal memorabilia of the artist-naturalist. Located on a migratory bird route and near the junction of the Green and Ohio Rivers, this beautiful sanctuary abounds in hardwoods, flowering trees, wild flowers, and bird life.

26. Lincoln Homestead State Park. Located 8 miles north of Fredrickstown in central Kentucky on Kentucky 528 off U.S. 150, Lincoln Homestead is another of the parks with few visitors. The average annual attendance is 67,263. The park's low attendance rate is a reflection on its limited facilities which consist of an 18-hole golf course, museum, 20 tent campsites, gift shop, and picnic area.

27. My Old Kentucky Home State Park. Located just east of Bardstown in central Kentucky on U.S. 150, My Old Kentucky Home reflects the old South that still lives in Kentucky. The park has an average annual attendance of 352,423 visitors. Federal Hill, the mansion immortalized in 1852 in Stephen Collins Foster's "My Old Kentucky Home," has been preserved in detail, including the period costumes of the hostesses who conduct tours of the home. A 9-hole golf course, gift shop, 36 tent and trailer campsites with a central service building, picnic area,

and playground await visitors. "The Stephen Foster Story," an outdoor drama, plays in the park amphitheater in the summer months.

28. Old Fort Harrod State Park. Old Fort Harrod is located in Harrodsburg, Kentucky about 40 miles southwest of Lexington on Kentucky 52. Fort Harrod is also one of the three lowest attended parks in the state having an average annual attendance of 91, 416 visitors. The park's facilities consist of a fort, museum, and picnic area.

Wilderness Parks

22. Kingdom Come State Park. Located 56 miles north of Pineville in Southeastern Kentucky on U.S. 119, Kingdom Come attracts the fewest visitors of any park in Kentucky, only 56,203 annually. The park's low attendance is a reflection on its facilities. They consist of 100 tent and trailer campsites, hiking trails, and a 3-acre lake. The park was named in honor of John Fox's novel, The Little Shepherd of Kingdom Come. Nearby the 38-mile Little Shepherd Trail winds through the mountain area taking the visitor close to spectacular rock formations and many species of trees and wildflowers.

25. Levi Jackson Wilderness Road State Park. Levi Jackson is located 12 miles north of Corbin in Southeastern Kentucky on U.S. 25. The park has 200 tent and trailer campsites with a central service building, picnic shelter with rest rooms, bathhouse and swimming pool, hiking, gift shop, horseback riding, fishing, and a playground with supervised recreation. Two

famous pioneer trails converge here, Boone's Trace and the Wilderness Road. The park includes McHargue's Mill and the Mountain Life Museum.

Future Park Development

Between Lake Barkley and Kentucky Lake in Western Kentucky, the eight by forty-mile wooded peninsula of the land between the lakes is being developed into a major recreation area devoted extensively to camping. Due for completion by 1971, the area will accommodate more than 20,000 overnight campers at developed sites plus thousands more in primitive camping areas. Included are 5,000 family-unit sites and year-round group camp areas with a 2,000 overnight capacity. 220 family unit campsites are now open for use at the Rushing Creek Embayment on the east side of Lake Barkley.

CHAPTER III

EXTERNAL FACTORS INFLUENCING ATTENDANCE AT KENTUCKY STATE PARKS

With the growth in the current concern for the need of outdoor recreation and recreational areas, geographers are becoming more involved in such work. They have and could add more to the knowledge of outdoor recreation in at least three ways:

> (1) By expanding and increasing studies of specific recreational and resort areas and by systematic studies of particular aspects of recreation,
> (2) by improving and elaborating techniques of identifying and classifying existing and potential outdoor recreational areas, and
> (3) by studying travel patterns (routes and distances) and tributary areas of recreational facilities.[1]

This last topic has often been slighted even in the literature of the Outdoor Recreational Resources Review Commission. Even though travel patterns and tributary areas have been somewhat pushed aside, knowledge of distances travelled by recreational-area visitors on various kinds of trips (vacation, touring, weekend, or day visits) and the primary tributary areas of various kinds of recreational areas is of great importance to outdoor recreation analysis and planning. An effort in this direction, therefore, seems appropriate even if it is limited

---

[1]John E. Trotter, "Some Factors Influencing Attendance at Illinois State Parks," Journal of Geography, LXIV (January 1965), pp. 23-31.

and tentative.

The attendance figures published for Kentucky state parks afford an opportunity to investigate some aspects of park attendance and population distribution. The location of parks near parkways, interstate highways, or good state roads has a bearing on park attendance. Closely related to this factor is the kind and quality of natural, historical, and recreational features of parks. Of less influence on attendance rates is the location of parks near population centers or in more densely settled parts of the state. To a certain extent, these factors can be shown to apply more or less to specific parks. It is much more difficult to find the degree of correlation between 75-mile tributary areas (a day's outing distance) and park attendance. This difficulty arises from several factors, one being that each park has its own "attracting power." The use of 75-mile tributary areas, nevertheless, serves to point out noteworthy aspects, especially in a comparative sense, of Kentucky State Park attendance.

Some 20,000,000 visits are now made annually to Kentucky parks. Attendance at individual parks ranges from over 5,000,000 (in 1968) at Kentucky Dam Village State Park to 71,000 at Kingdom Come State Park. These figures are published annually by the Kentucky Department of Parks and show the number of visits to each park--this means that each visitor is counted each day he is present in the park. The information is limited in several ways, two of which are: (1) the accuracy and reliability of the count is questionable, and (2) there is

no breakdown as to place of origin of visitors or why the visitors selected the park as a place to visit.

The attendance for each park used in this chapter is the average annual attendance for the two years 1967-1968 (Table 1). Earlier figures are available, but were not used because several of the parks were not open prior to 1967. Only twenty-eight of the thirty-two state parks are included because the others are temporarily closed due to inadequate facilities.

TABLE 1

TWO-YEAR AVERAGE ANNUAL ATTENDANCE (28 PARKS)

Parks	Attendance
Kentucky Dam Village	5,494,218
Cumberland Falls	1,515,638
Rough River	1,287,287
Jenny Wiley	1,171,861
Levi Jackson	903,051
General Butler	702,774
Fort Boonesboro	689,241
Natural Bridge	662,786
Carter Caves	648,072
John James Audubon	610,897
Pennyrile	551,545
General Burnside Island	466,946
Lake Cumberland	437,667
Kenlake	353,045
My Old Kentucky Home	352,423
Barren River	334,170
Pine Mountain	304,986
Greenbo Lake	294,348
Buckhorn Lake	233,937
Falmouth Lake	208,627
Lake Malone	201,379
Blue Licks	198,407
Lake Barkley	153,551
Big Bone Lick	132,465
Columbus Belmont	131,027
Old Fort Harrod	91,416
Lincoln Homestead	67,263
Kingdom Come	56,203

The Location Factor

Location close to an interstate highway, freeway, or good state road is a significant factor in park attendance. When a road map of Kentucky is examined, some interesting correlations can be made. The park with the largest annual attendance, Kentucky Dam Village, is located close to the Purchase Parkway and is thus situated on one of the major north-south corridors of travel in the east central United States (compare Figures 1 and 4). Cumberland Falls, the park with the second largest attendance, is also located on or close to a major highway. The parks with less than 300,000 annual visits are located on or close to the poorer, less improved roads.

Location within populous sections of the state and proximity to larger centers of population are less significant factors in park attendance. Roughly dividing Kentucky into three sections formed by north-south lines along the 84th and 86th meridians, it is found that three of the six parks with a two-year average attendance of more than 700,000 are located in Central Kentucky (Figure 2). Only two parks in Central Kentucky have fewer than 100,000 visits. This is the most populous section of the state with more than 2,000,000 inhabitants or nearly 67 per cent of the total population.[2] The Louisville, Covington, and Lexington metropolitan areas have over 30 per cent of the state's population and there are sub-

---

[2]U.S., Bureau of the Census, Eighteenth Census of the United States: 1960. Population, I, p. 24.

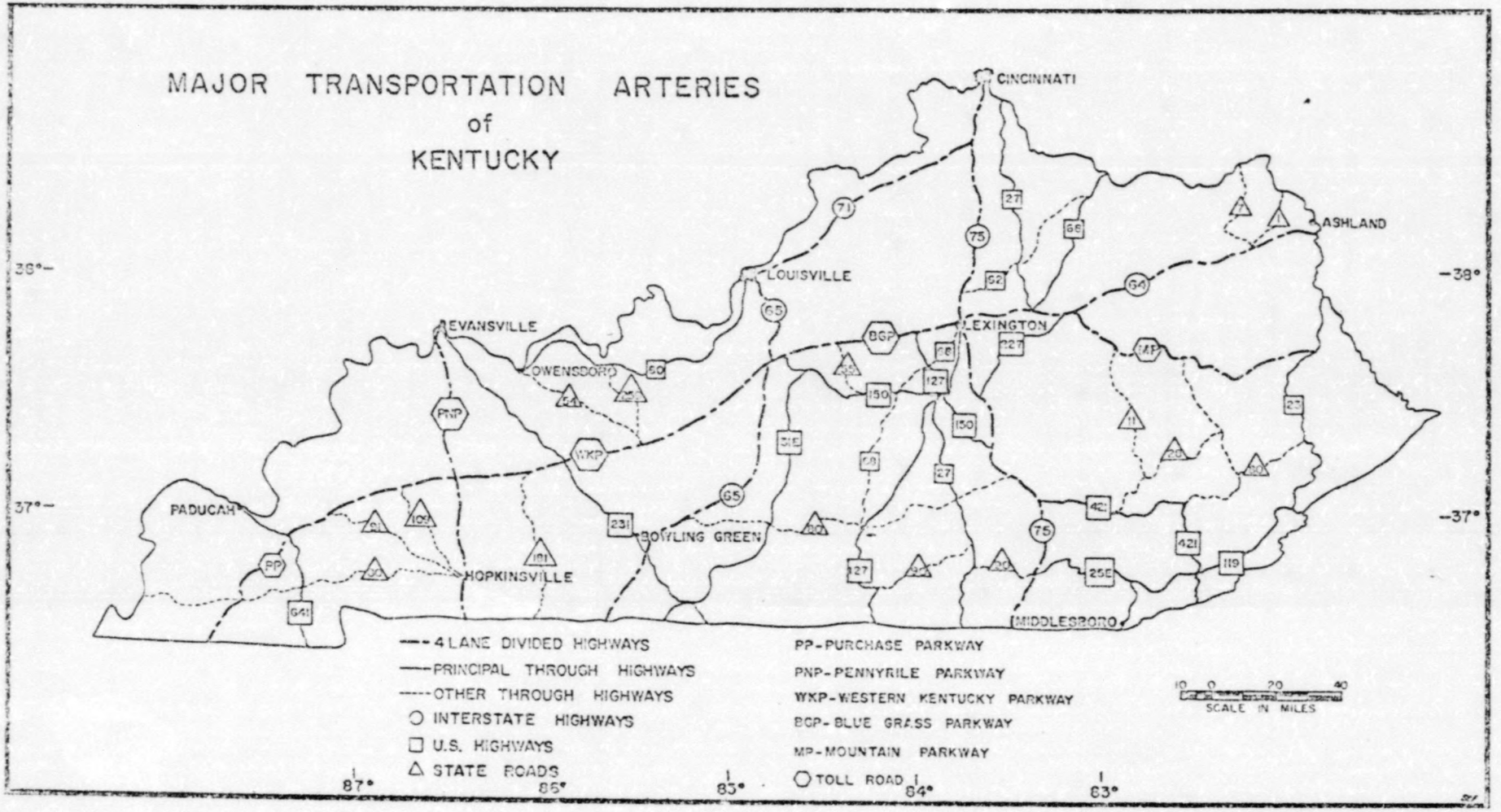

MAJOR TRANSPORTATION ARTERIES
of
KENTUCKY
CINCINNATI
ASHLAND
LOUISVILLE
LEXINGTON
EVANSVILLE
OWENSBORO
PADUCAH
HOPKINSVILLE
BOWLING GREEN
MIDDLESBORO
38°
37°
39°
87°
86°
85°
84°
83°
4 LANE DIVIDED HIGHWAYS
PRINCIPAL THROUGH HIGHWAYS
OTHER THROUGH HIGHWAYS
INTERSTATE HIGHWAYS
U.S. HIGHWAYS
STATE ROADS
TOLL ROAD
PP-PURCHASE PARKWAY
PNP-PENNYRILE PARKWAY
WKP-WESTERN KENTUCKY PARKWAY
BGP-BLUE GRASS PARKWAY
MP-MOUNTAIN PARKWAY
SCALE IN MILES

Figure 4

stantial concentrations of population in south central Kentucky. All but three of the state parks in Central Kentucky are within 100 miles of Louisville, and eight have more than 1,500,000 persons living within 75 miles of the park (Table 2). Four parks have more than 2,500,000 persons within a 75-mile tributary area.[3]

TABLE 2

POPULATION OF 75-MILE TRIBUTARY AREA

Parks	Population of Tributary Area
Big Bone Lick	3,207,217
General Butler	3,185,435
Falmouth Lake	3,163,654
Blue Licks	2,650,636
Levi Jackson	1,816,500
Old Fort Harrod	1,643,608
Buckhorn Lake	1,634,639
Lincoln Homestead	1,601,539
Pine Mountain	1,588,231
My Old Kentucky Home	1,580,166
Jenny Wiley	1,548,649
Lake Malone	1,482,344
Rough River	1,459,415
Lake Barkley	1,339,259
Barren River	1,299,920
Pennyrile	1,288,358
Kingdom Come	1,233,544
Cumberland Falls	1,229,427
Kenlake	1,187,509
Natural Bridge	1,137,799
Carter Caves	1,125,091
Fort Boonesboro	1,092,825
General Burnside Island	1,086,405
Greenbo Lake	1,045,337
Lake Cumberland	975,915
Kentucky Dam Village	909,476
Columbus Belmont	819,454
John James Audubon	773,774

[3]The 75-mile tributary areas include the population of neighboring states where the tributary area extends outside Kentucky. Each population total was derived from the 1960 census tract of county population.

Of the eight state parks in Western Kentucky, four have more than 500,000 visitors. The population of Western Kentucky, much less than the central section, is approximately 635,000, with population concentrations around Bowling Green, Hopkinsville, and Paducah. Most of the western portion also has a large rural population. While five of the eight state parks have 75-mile tributary areas of more than 1,000,000 persons, none of these exceed 1,500,000. In this area, however, it appears that location close to large urban centers has a less dominant effect on attendance, as many of these parks have high attendance rates and there are no urban centers with a population over 100,000 within a 75-mile radius.

John James Audubon State Park, 15 miles south of Evansville, Indiana, is the only park located close to a large urban center. Five of the eight state parks in this section of Kentucky have annual attendance rates of over 350,000. Seven of these parks are located close to major highways. This further substantiates the influence of transportation as a major factor in attendance rates.

The population of eastern Kentucky is also comparatively low being approximately 684,000. There are three urban areas of concentration, Ashland, Pikesville, and Middlesboro. These areas of population concentration, however, do not have a great amount of influence on the seven state parks in eastern Kentucky. Of these seven parks, only one has less than 150,000 visitors, three have more than 650,000 visitors, and only two are not located close or adjacent to a major highway.

Even though the location of state parks relative to large urban centers does not effect the attendance as greatly as other factors, it must be realized that without these population concentrations, park attendance would naturally decline. The area which would be effected greatest by a drop in population is Central Kentucky. Of the thirteen state parks in Central Kentucky, eight are located close to large urban centers, but two of these have less than 100,000 visitors annually. If these urban centers declined in population, this could force some of the less visited parks to close.

Attracting Power

Another of the major factors influencing attendance at Kentucky state parks involves the "attracting power" of a park. Attracting power exists primarily in outstanding or special features of scenic or historical nature. Associated with these special features are the naturalistic outdoor characteristics including water bodies, woodland, campsites, and diverse terrain. One of the major attributes of Kentucky state parks, however, is the availability of a lodge and lodge facilities. Opportunities for active outdoor recreation (swimming, boating, skiing) also have a significant influence on the attendance rates. Two other park attributes--size and age--seem to have a very minor amount of influence on attendance.

Nine of the seventeen parks with more than 300,000 visitors have outstanding attractions such as My Old Kentucky Home, and are for the most part small in size. Strangely enough, many of these parks are relatively young, yet already

are strongly attractive. For example, Daniel Boone's first settlement is exhibited at Fort Boonesboro and this park has an annual attendance of 689,241. Only three of the eight parks with less than 100,000 visitors have good natural or historical attractions or associated special events. The remaining three parks are among the lower 15 per cent of all parks in ratio of attendance to population of their tributary areas (Table 3).

TABLE 3

RATIO OF 2-YEAR AVERAGE ATTENDANCE TO POPULATION OF TRIBUTARY AREAS

Parks	Attendance
Kentucky Dam Village	6.041
Cumberland Falls	1.232
Rough River	.885
John James Audubon	.789
Jenny Wiley	.756
Fort Boonesboro	.630
Natural Bridge	.582
Carter Caves	.576
Levi Jackson	.497
Lake Cumberland	.448
General Burnside Island	.429
Pennyrile	.428
Kenlake	.297
Greenbo Lake	.280
Barren River	.257
My Old Kentucky Home	.223
General Butler	.220
Pine Mountain	.192
Columbus Belmont	.159
Buckhorn Lake	.142
Lake Malone	.135
Lake Barkley	.114
Blue Licks	.074
Falmouth	.065
Old Fort Harrod	.055
Kingdom Come	.045
Lincoln Homestead	.041
Big Bone Lick	.041

Of the various categories listed under "attracting power," campsites are one of the most desired facilities (Figure 5). Of the seventeen parks with more than 300,000 visitors, sixteen have over 50 campsites. Fifty seems to be a rather low figure, but when one considers that the average family using a campsite consists of four people, this means an average of 200 visitors daily for overnight activities. To further substantiate the influence of campsites, only three of the eleven parks with less than 300,000 visitors have over 50 campsites, while most have less than 25.

One of the greatest attracting factors for Kentucky's parks is the availability of a lodge and lodge facilities. These facilities include a large dining room, a swimming pool, a dance hall, and sleeping accommodations. Eleven of the thirteen parks with more than 400,000 visitors have these facilities. In fact, four of these parks attract over 1,000,000 visitors annually. These four parks have expanded their lodge facilities every year over the last decade, and their attendance rates have increased in direct proportion to the rate the facilities have been expanded.

Strangely enough, twenty-five of Kentucky's twenty-eight state parks have relatively high attendance (100,000 or more visitors annually). This can be used as evidence in support of the Kentucky Park System, and shows that the people who live in the Kentucky area utilize the available facilities. This is best demonstrated by analyzing the ratios of attendance relative to the population of the 75-mile tributary areas for

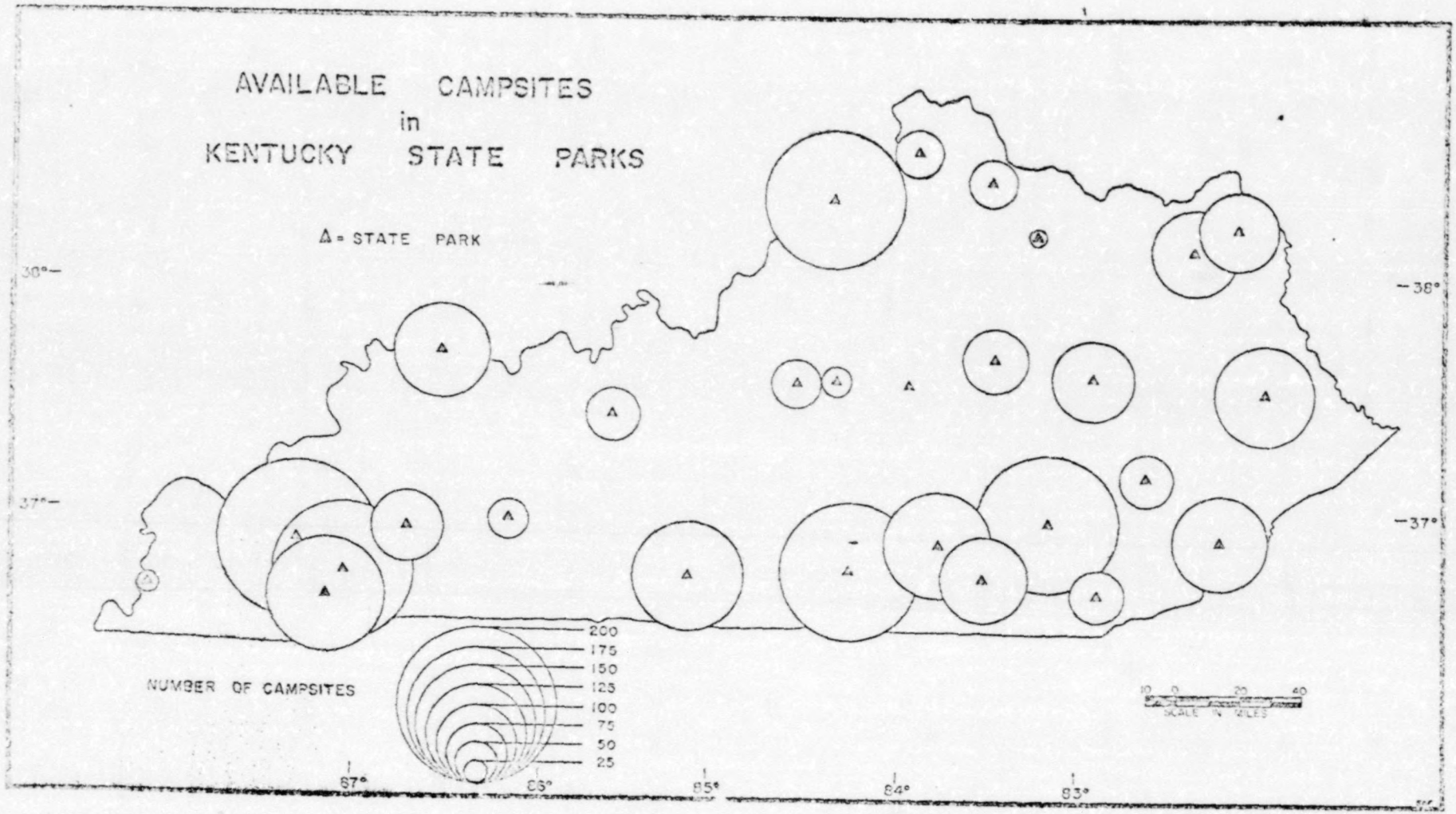

AVAILABLE CAMPSITES
in
KENTUCKY STATE PARKS
Δ = STATE PARK
38°
37°
200
175
150
125
100
75
50
25
NUMBER OF CAMPSITES
87°
86°
85°
84°
83°

Figure 5

each park (compare Tables 2 and 3).

Only three parks are attended by fewer than 100,000 visitors annually. These parks are small in size, have limited attractions, and are difficult to reach due to location on poorer roads. Old Fort Harrod State Park, for example, is located 40 miles southwest of Lexington on Kentucky 52. The park consists of a 15-acre fort for visitors to inspect, but contains no facilities for camping or recreation. At the other extreme, Kentucky Dam Village State Park consists of 1,200 acres containing 225 campsites, an extensive lodge, 70 cottages, is adjacent to a 128,000-acre lake, and is situated close to the Purchase Parkway. When these two parks are compared, it is noteworthy that Old Fort Harrod has a tributary area population of over 1,600,000 while Kentucky Dam Village has a tributary population of just over 900,000. The resulting ratios in Table 3 show the contrast which has been evidenced here.

Supporting the position that the factors discussed so far are some of the most influential as far as attracting power is concerned is the example of Lake Barkley State Park. This 3,600-acre park is the largest in Kentucky's park system. It ranks, however, in the lower 20 per cent as far as attendance is concerned because it had no lodge facilities until late in 1969. Though campsites and water facilities were available, people found other parks more attractive. Now that a new lodge facility has been built, critics assume that next year's attendance rate will almost triple.

By way of further comparisons, five of the thirteen parks in Central Kentucky with fewer than 200,000 visitors are less than 400 acres in size, limited in facilities, and have limited attractions. A second five are of at least 800 acres in size and have outstanding attractions. It is true that several of these parks are distant from the larger cities; nevertheless, the ratios of attendance are low whether near or distant from larger cities (Table 3 and Figure 4). The relative low attendance of these parks can be attributed to the fact that they are located on poorer roads and are not as accessible as the more frequented parks.

It is interesting to note that nine Kentucky parks have no lake or water area available to visitors. Of these nine parks, only three have more than 200,000 visitors annually. This indicates that water affiliated activities tend to attract the greater number of visitors to outdoor areas. Another interesting fact is that six of the twenty-eight parks have no facilities for swimming. Four of these six parks have less than 130,000 visitors annually. Only twelve parks have lakes large enough for water skiing, and only one of these has less than 200,000 visitors. The ratios of average attendance to population of 75-mile tributary areas for almost all of these parks are comparatively high with only two being low (Table 3). These two are located on poorer roads.

In some sections of the state, notably southeastern Kentucky, other recreational areas may provide substantial competition for state parks, and thus reduce park attendance.

Recreational areas in the Jefferson National Forest and Cranks Wildlife Management Area in southeastern Kentucky are in some instances equal or superior to the available state parks. The prime example in this area is Kingdom Come State Park which has less than 60,000 visitors and is located close to the Jefferson National Forest. Of course, there is competition among many of the state parks in all sections of the state. No park has a 75-mile tributary area which does not overlap the 75-mile tributary area of another park. Thus two or more parks are in a sense competing for visitors from any given area where their tributary areas overlap. In such cases, the park with unusual or more extensive facilities appears to attract more visitors.

Out-of-State Campers

Many of the problems concerning actual park tributary areas and relative attractive power of parks could be solved if data were available which listed the place of trip origination and original destination of park visitors.[4] This information is not available, but the Kentucky Department of Parks does list the number of out-of-state campers staying at twelve of the larger parks. Table 4 shows the number of such campers at these twelve parks during 1967. These data can be used to gain some insight into the extent parks attract visitors from inside or beyond a 75-mile tributary area. Due to the fact

---

[4]The fact must also be considered that some people become side-tracked if they need a place to spend one or two nights on their way to an original destination.

that only one park in Kentucky's system has a 75-mile tributary area entirely within the state, these figures reveal the significant role these parks play in outdoor recreation. It is interesting to note that Ohio and Illinois account for 51 per cent of the total number of campers shown in Table 4. This can be correlated with the fact that many of Kentucky's state parks lie on north-south routes which many people from Ohio and Illinois use in travelling to Florida or the southeastern coast.

TABLE 4

NUMBER OF OUT-OF-STATE CAMPERS FOR 1967

Parks	Attendance
Kentucky Dam Village	47,763
Lake Cumberland	39,740
Carter Caves	39,530
Cumberland Falls	32,150
General Butler	26,489
Pennyrile	21,048
Kenlake	17,056
Natural Bridge	15,648
Jenny Wiley	14,588
Rough River	11,497
Pine Mountain	9,766
Buckhorn Lake	3,189

Nine of the twelve parks listed in Table 4 are also located near the Kentucky State boundary. This is a major reason for the high number of out-of-state campers visiting at these parks. This high number also shows that Kentucky does have a fairly well developed park system capable of accommodating large numbers of out-of-state campers.

Summary

Obviously, proximity to major highways, proximity to population concentrations, and the attracting power of individual parks are important factors influencing park attendance although available data do not permit detailed evaluation of their relative importance. Under these circumstances, it is difficult to determine the size of tributary areas from which the bulk of visitors to various parks are drawn. A reasonable assumption is that the greater number of visitors are on day outings driving a maximum of 75 miles one way.

The correlation between park attendance and population is rather low--the correlation coefficient for twenty-eight parks is .23. It does not necessarily follow that the low correlation invalidates the use of tributary areas to determine actual and potential distances people will travel on day or longer visits, or the areas from which the bulk of park attendance may be expected to be drawn. The low correlation could be influenced by a few exceptional parks. Further, the low correlation may not be as insignificant as it may seem. A t-test shows that there is less than one chance in 1,000 that such a correlation would arise due to chance alone. Therefore, a null hypothesis that no relationship exists between park attendance and the population of a 75-mile tributary area is rejected, even though the correlation may be very minor. Considering only the two variables (attendance and population of 75-mile tributary areas), an r^2 of .06 indicates that about six per cent of the variation of park attendance is attributed

to variation in the population of 75-mile tributary areas.

The use of the 75-mile tributary area in Kentucky suggests that some parks attract small proportions of the population of these areas, while others attract people from a much wider area. Exceptional parks will attract visitors from greater distances, while parks somehow limited in quality will attract visitors from a restricted area even though attendance may be high if they have densely populated tributary areas. Clearly, the tributary area from which the bulk of park visitors may be expected varies with the attracting power and location of the park. Categories of parks might be established based on attracting capabilities as indicated by actual attendance and modified location with respect to heavily populated areas and heavily travelled tourist routes. Parks of different categories would have tributary areas of different radii.

CHAPTER IV

A USER RESPONSE FORMULA FOR KENTUCKY STATE PARKS

The national average for state park areas is about thirty acres per one thousand population. Ten states have park acreages above this average while, at the other extreme, twenty-four states have park acreages of less than ten acres per one thousand people, with Kentucky ranking in the lower group.[1] Comparing total acreage in parks with total number of visits, Kentucky's facilities experience some 636 visits per acre per year. This would indicate that the average visits for the entire park system is about 2 people per day, per acre. In other words, if a park consists of 1,000 acres, at least 2,000 people would be expected to visit that park in one day. This, of course, is an average for all parks.

As stated in Chapter III, many factors influence the attendance at a recreational area and thus in turn account for the variation in attendance at the different state parks. Some of the more prominent factors are the size of a park, the number of available water acres, the number of campsites, the availability of swimming, the number of parking spaces and the fee charged to use the park. Of course, other factors are influential, but these are basic and are discussed in this and previous chapters.

---

[1]Highsmith, Jensen, and Rudd, op. cit., p. 191.

To show the influence various factors have on park attendance, two scatter diagrams have been drawn to exemplify the relationship between park facilities and park attendance (Figures 6 and 7). These diagrams show that certain facilities have an effect on the total number of visitors attending the various parks. It is the purpose of this chapter to show the significance of these facilities.

Methodology

From studies which have been conducted concerning recreation areas, a production process has been developed to aid research centered around state parks.[2] In this study, a recreation area is considered to be a production process whereby the recreation visits, or the output of the area have a definite limited relation to the size and characteristics of the recreation area. The inputs of production (land acres, water acres, campsites, parking spaces, etc.) will be used to ascertain a function that explains the total visits to the facility (the output).

Due to the fact that facility acreage from park to park varies, a change in the recreation visits from park to park can also be substantiated (compare Figures 2 and 3). Various changes in these inputs could be made, for example, by changing parking space to camp space, which in turn could effect attendance. In the case of Kentucky's parks, such

---

[2]J. J. Seneca, P. Davison, and F. G. Adams, "An Analysis of Recreational Use of TVA Lakes," Land Economics, XLIV (1968), pp. 529-534.

FIGURE 6

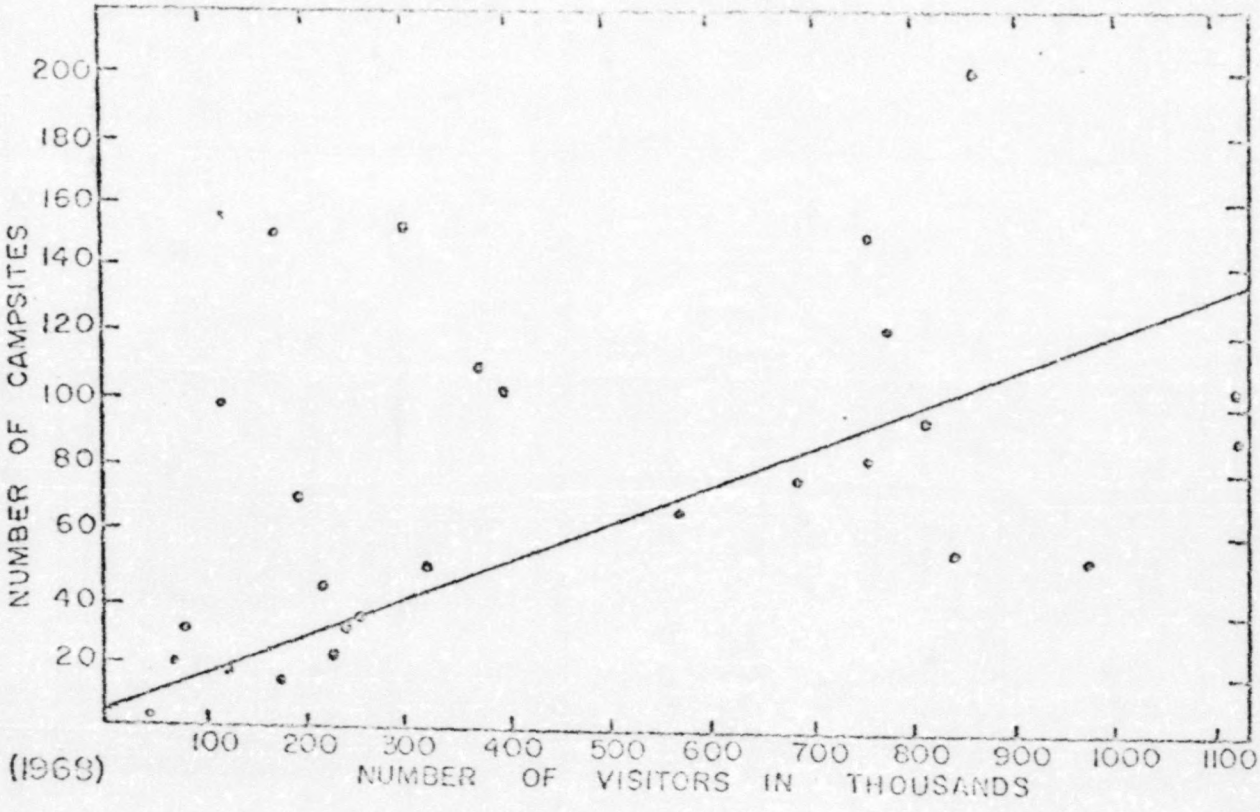
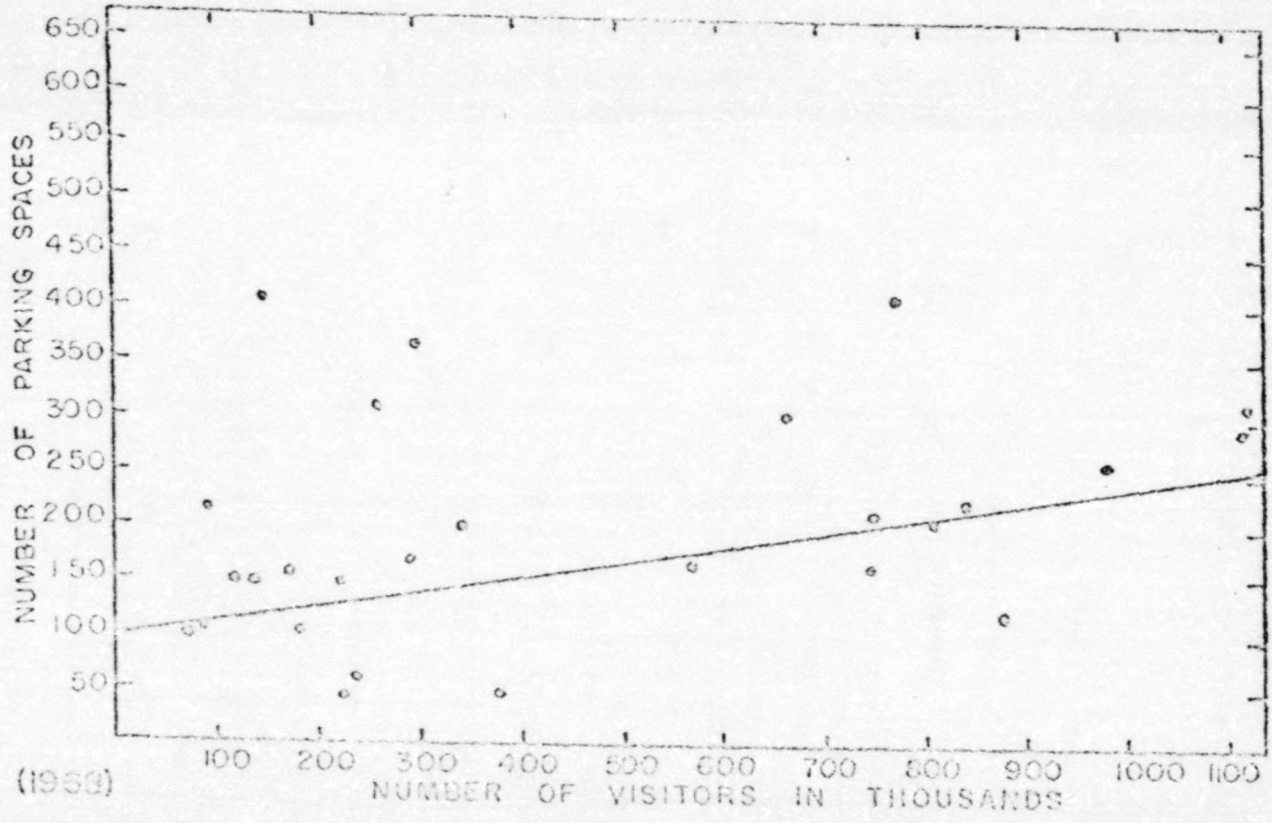


FIGURE 7



changes would be of major concern in plans for future expansion or building of new parks.

To express the relationship between the inputs and output of outdoor recreation, the function

$$V = f(F,G)$$

is used where (V) is the total number of recreation visits and is a function of the amount of facilities (F) and total acreage (G) that is found in a recreation site. Definite estimates of the percentages that each feature would effect the number of total visitors could be arrived at by either increasing or decreasing the quantity of the input facilities in a park. Therefore, this equation is regarded as a function of user response which sets up a definite relationship between state park use (the total number of visitors) and the facilities found at that park.

There are three basic production relations, linear, input-output, and linear logarithmic. Of these three, the linear logarithmic has the most meaningful properties when used in an outdoor recreation study.[3] To show these values, the first equation can be changed to read:

$$V_j = AX_{ij}^{B_I} \ldots X_{Kj}^{B_k} U_j$$

The term (V_j) is the number of recreation visits and is a multiple function of the size and facilities of a state park

---

[3]J. J. Seneca and C. J. Cicchetti, "User Response in Outdoor Recreation: A Production Analysis," Journal of Leisure Research, I (Winter, 1969), pp. 238-245.

(X_{ij}). The index j covers the number of parks in the study, and the index i ranges from 1 to k, where k is the number of independent variables. The (B) parameters are indicators of the percentage change in the input factors. The percentage changes will be proportional to, greater than, or less than the change in the input depending on whether the factor itself is changed proportionally, made greater, or made less. The final figure (A) is the constant, and the (U_j) is the error term.

A User Response Equation

The data used to estimate parameters for the above equation were taken from materials gathered in 1968 by the Kentucky State Department of Parks and represents mainly the twenty-eight parks in Kentucky having water and camping oriented outdoor activities (see Figure 1). The data consisted of the total number of recreation visits recorded for each park in 1968, and these correlated with the facilities found in each park. The facilities considered were variables such as: total land acres, total water acres, number of campsites, the availability of swimming, fees charged, the number of cottages, and the number of parking spaces.

As has already been stated in connection with the second equation, the linear logarithmic function would produce the most meaningful results for this study. A third and final equation, therefore, was set up to read:

$$\text{Log } V_j = \log a + b \log L + cW + d \log CS + eS + f \log F + gCT + h \log P$$

Where

V_j is the total number of visitors

L is the total land acres in the park

W is the total water acres in the park

CS is the number of campsites

S is the availability of swimming

F is the fee charged

CT is the number of cottages

P is the number of parking spaces

To obtain the most normal distribution of data in such an equation, log transformations should be used. This particular equation, however, presented the problem that when logs were used some very abnormal distributions were obtained. To overcome these abnormal distributions, linear transformations were substituted in the place of logs for three of the original variables. After running the regression equation, the following figures were obtained:

$$\text{Log } V_j = .5656 \log L + .2026 W + .5819 \log CS + .3621 S + .1403 \log F + .6333 CT + .0553 \log P$$

The coefficient of multiple correlation (R) was .9129 and the coefficient of multiple determination (R^2) was .8450. This R^2 is exceptionally high for this type of data when compared to other studies which have been done on similar subjects.[4] The F test (7,20) was 15.588 and proved to be significant at the 90 per cent confidence level. The T test for each variable

---

[4] Ibid., p. 240.

was as follows:

L = 3.4516*

W = 1.7070

CS + 3.1521*

S + 2.9705*

F + .9198

CT + 5.0545*

P + .3990

*Significant at the .1 level

The parameters from this equation revel that cottages .6333 had the highest significant relationship to the variation in number of visitors with campsites .5819, land acres .5656, and swimming .3621 ranked according to their significance. These variables explained almost 85 per cent of the variance in the total number of visitors.

The coefficient of .6333 for cottages, however, was considered to be rather high due to the fact that only eleven of the twenty-eight parks studied had any cottages. It was also felt that since every park charged approximately the same fee, the variable for fees would have less influence on the number of visitors than needed to be included in the equation. Due to these assumptions, a new regression model was set up which excluded the two variables for cottages and fees. The results on this model were as follows:

$$\text{Log } V_j = .6158 \log L + .0039 W + .6904 \log CS + .5478 S + .3531 \log P$$

The coefficient of multiple correlation (R) was .8029 and

the coefficient of multiple determination (R^2) was .6446. This R^2 was not quite as high as was expected; however, these five independent variables explained almost 65 per cent of the variance in the number of visitors. The F test in this model was 7.98 or a significant value at the 90 per cent level of confidence. The T test for each variable was as follows:

L = 2.666

W = 2.560

CS = 3.147*

S = 3.284*

P = 2.261

*Significant at the .1 level

The parameters derived from this equation revealed that the number of campsites .6904 have a greater attracting influence than the number of land acres .6158. This relationship indicates that the number of visitors will increase less than proportionally with a given percentage increase in campsites or land acres. Another way of stating this relationship is that in the elastic relation between the number of visitors and the campsites available, the number of visitors will increase 6.9 per cent for every 10 per cent increase in the number of campsites, and for every 10 per cent increase in the number of land acres, a 6.1 per cent increase in the number of visitors can be expected. Parking spaces are also effective by giving a 3.5 per cent increase in visitors if the number of spaces is increased by 10 per cent. Surprisingly, the significance of water acres was not great enough to be analyzed.

The final significant variable, swimming, shows the necessity of this activity for attracting visitors to a park. The swimming coefficient .5478 indicates that facilities for this activity are important attractions to state parks.

From the final equation, it can be seen that such a user response formula is of great value. By determining the parameters in such a model, specific estimates for future growth and additions to a park system can be made.

Analysis of the Simple Correlation Coefficients

The basic reason for the use of a regression model is to have a means of measuring the association between variables. By using coefficients of correlation and determination, one can estimate the relative importance of each variable. The simple correlation coefficients and coefficients of determination for the user response equation were as follow:

CORRELATION BETWEEN EACH VARIABLE AND THE NUMBER OF VISITORS

Variable	Correlation Coefficient	Correlation of Determination
Land acres	.3382	.1144
Water acres	.3307	.1094
Campsites	.5951*	.3542
Swimming	.5201*	.2705
Parking Spaces	.4148	.1720

*Significant at .1 level

By way of explanation, a correlation coefficient is an absolute quantity which helps to determine the linear correlation between the various independent and dependent variables. The coefficient of determination gives the per cent of correl-

ation between two such variables. The correlation coefficient of .5951 for campsites means that 35 per cent of the variation in the number of visitors at Kentucky state parks is explained by this variable (See Figure 5). Likewise, the variable for swimming.5201 explains 27 per cent of this variation. The other three variables are not as significant as these two when considered separately, but when considered collectively, they explain 38 per cent of the variation in the number of visitors.

These relationships can be better seen when they are plotted on scatter diagrams. If the points plotted on the diagram tend to cluster about a line parallel to the X axis, there is little or no linear correlation. This means that the variable plotted would have little effect on the variation in the number of visitors. On the other hand, if the points tend to cluster along a line with a definite slope, the variable plotted has a certain degree of relationship to the variation in the number of visitors.[5] Two of the independent variables (input figures) have been plotted in figures 6 and 7 showing the relationship each had to the variation in the number of visitors at each park.

As can be seen, both of the diagrams show some sort of a linear correlation. For the variables of campsites and parking spaces, the correlation is positive, meaning that if the quantity of these two variables is increased, the number

---

[5]R. G. Steel and J. H. Torrie, Principles and Procedures of Statistics (New York: McGraw-Hill Book Company, 1960), p. 244.

of visitors will also increase. This can be seen by the direction of slope of the lines drawn on the appropriate diagram for each variable.

Analysis of the Residuals

As has already been stated, Kentucky's state parks experience, on the average, almost 650 visits per day. Of the twenty-eight parks analyzed in this study, six have attendance rates exceeding the average while seven have rates less than the average. To show how each park compares to the average or mean attendance, a map of residual values has been prepared (Figure 8). Residuals are figures obtained by subtracting the estimated park attendance from the actual observed attendance. If a plus figure is obtained, the park exceeds the expected rate of attendance. If a negative figure is obtained, the park has attendance rates less than the expected total. If a park has a residual value between -.49 and +.49, it is considered to have an average attendance on figure 8.

Various reasons for plus or negative residuals can be cited; however, the major ones have been discussed in Chapter III. Only one reason, therefore, will be mentioned here. In figure 8, six parks have a residual value of +.50 or greater. After studying these parks, it was learned that each had a lodge facility and could accommodate more than an average of 300 visitors. The conclusion can be reached, therefore, that to attract more visitors, a park must have a lodge as part of its basic facilities.

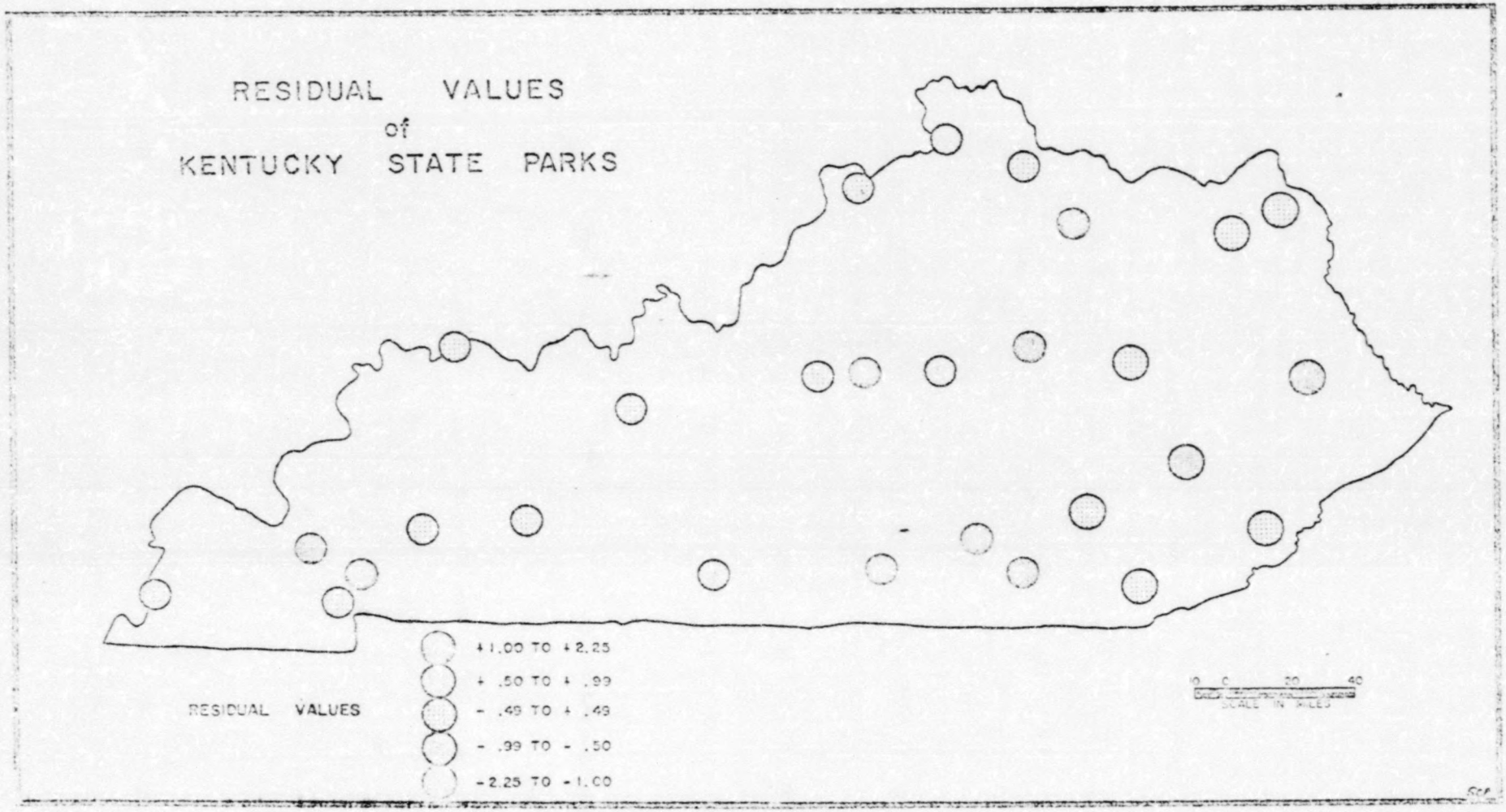

RESIDUAL VALUES
of
KENTUCKY STATE PARKS
RESIDUAL VALUES
+1.00 TO +2.25
+ .50 TO + .99
- .49 TO + .49
- .99 TO - .50
-2.25 TO -1.00
0
50
SCALE IN MILES

Figure 8

Final Analysis

As has been shown by the final user response equation, the variables which have a significant effect on the variation in the number of visitors to Kentucky's state parks are campsites .6904 and swimming .5478. The five variables studied in the equation accounted for over 60 per cent of the total variance in the number of visitors. Generally, a better picture of a factor can be seen when it is compared cartogrphically to the total number of visitors. By comparing figure 5 with figure 2, it can be seen that the parks with the greater number of campsites have the larger rates of attendance. By comparing figure 3 with figure 2, the opposite picture can be seen. Parks with large amounts of land acres have the lower rates of attendance. When figure 10 is compared with figure 2, it can be seen that the number of parking spaces corresponds closely with the number of visitors. Figure 9 shows that the variable for water acres has little influence on the total number of visitors. A map for the swimming variable was not prepared due to the fact that a park either has or does not have swimming as an activity.

Summary

This chapter has dealt with an example of research that demonstrates a strong statistical association between total park attendance and recreation facilities. The equation derived can be used in several advantageous ways. The importance of various facilities can be judged by their use. Appropriate changes in facilities can be predicted for

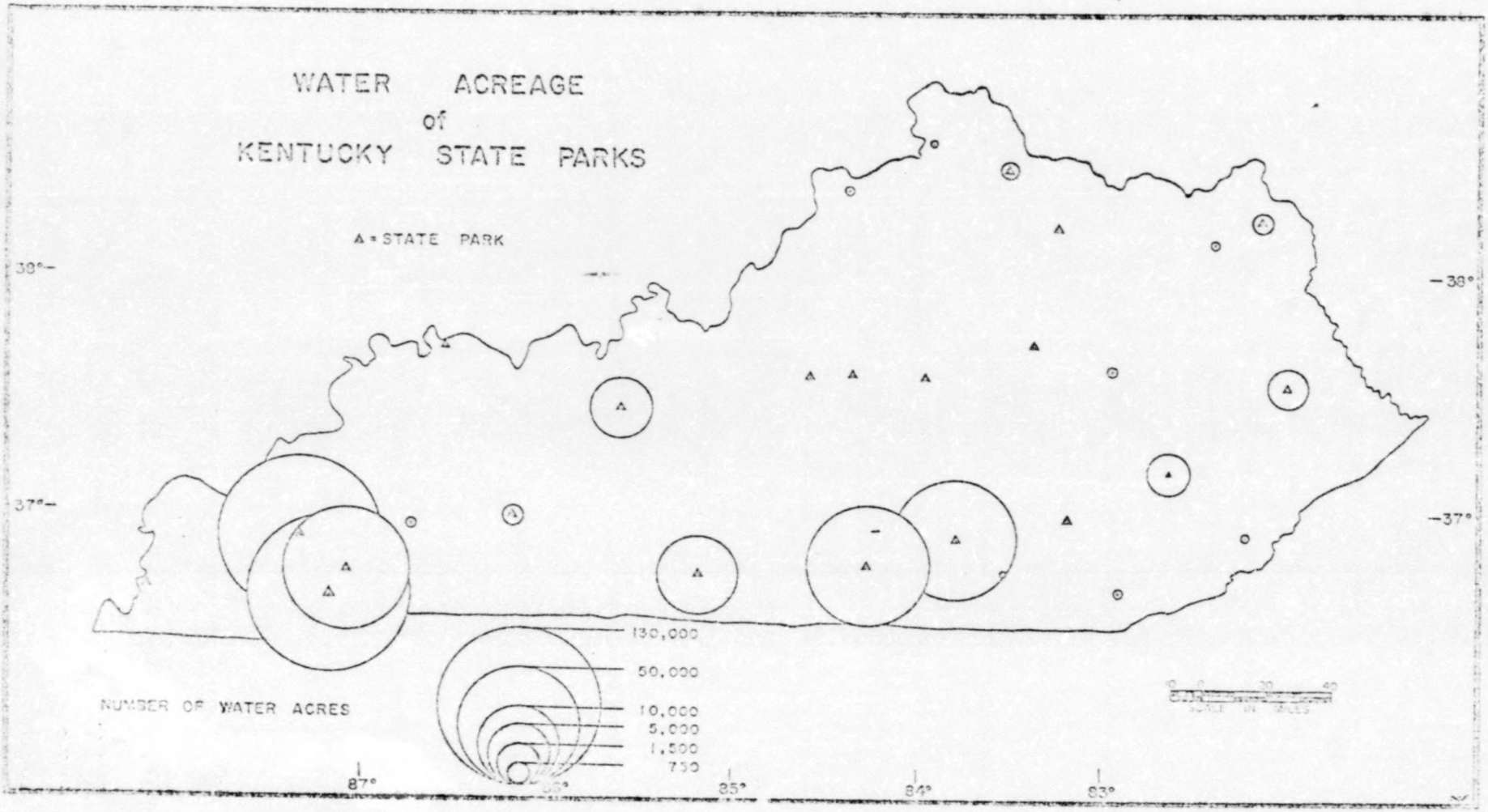

WATER ACREAGE
of
KENTUCKY STATE PARKS
▲ = STATE PARK
38°
37°
130,000
50,000
10,000
5,000
1,500
750
NUMBER OF WATER ACRES
87°
86°
85°
84°
83°

Figure 9

[no p 63]

increased rates in attendance. Likewise, future expansion or change can be made with consideration focused on the number of visits each expansion or change will bring. This, in itself, is an aid to recreation planners and other officials associated with this field.

CHAPTER V

SUMMARY

In the last twenty years, recreation has become an important aspect of American economy. With the increased amount of recreation land use, studies in recreation will be of increasing importance in the next decade. Kentucky, as well as every other state, will need to concentrate more and more effort in advancing its recreation facilities. Consideration as to transportation arteries, facilities, and available population will be important location factors for future recreation areas.

The difficulties of computing values of resources used for recreation and to otherwise deal with the demand structure of such a non-market commodity are considerable. The basic methods examined in the previous chapters offer extremely useful approaches to the relevant problems although there are questions that remain. While the effects of time constraints are possibly the most important of these, there are others which appear in other specific applications. These are no doubt important but they may perhaps be lessened with the use of further information or other assumptions that would not detract totally from the seemingly useful guides that such studies can provide. A further advantage is that improvements can be made without essentially discarding the apparatus and starting

anew. A final advantage is that the analysis of such a study can be expanded to examine possible implications of recreation on such things as transportation patterns from urban areas or regional water development schemes.

The flexibility of the applications of the user response function can improve the efficiency of policy discussions in the recreation resource area. It can restore also the considerations of production and, therefore, supply aspects and their implications in the analysis of recreation problems.

SELECTED BIBLIOGRAPHY

Government Publications

Kentucky Department of Publication Information. Kentucky State Parks: A General Study. Frankfort: Kentucky Printing Office, 1964.

Kentucky State Department of Parks. Census Statistics Concerning State Parks. Frankfort: Kentucky Printing Office, 1968.

Outdoor Recreation Resourses Review Commission. Outdoor Recreation for America. Washington: U.S. Goverment Printing Office, 1962.

U.S. Bureau of the Census. Eighteenth Census of the United States. Washington: U.S. Government Printing Office, 1960.

Books

Clawson, M. Methods of Measuring the Demand for and Value of Outdoor Recreation. Baltimore: The Johns Hopkins Press, 1959.

Clawson, M.,Held, R.B., and Stoddard, C.H. Land for the Future. Baltimore: The Johns Hopkins Press, 1962.

Highsmith, R., Jensen, J.G., and Rudd, R.D. Conservation in the United States. Chicago: Rand McNally and Co., 1962.

James, Preston E. and Jones, Clarence F. American Geography: Inventory and Prospect. Syracuse: Syracuse University Press, 1954.

Peterson, William. Population. New York: MacMillan Book Company, 1969.

Palumbo, Dennis J. Statistics in Political and Behavioral Science. New York: Meridith Corporation, 1969.

Steel, R.G. and Torrie, J.H. Principles and Procedures of Statistics. New York: McGraw-Hill Book Company, 1960.

Taeuber, Irene. Future Population Trends and Prospects. New York: United Nations Press, 1966.

Magazines and Periodicals

Booth, A.W. "The Lakes of the Northeastern Inland Empire: A Study of Recreational Sites," Bureau of Economics and Research, V (Pullman, Washington, 1948), 22-31.

Brown, R.M. "The Business of Recreation," Geographical Review, XXV (1935), 467-475.

Carlson, A.S. "Recreational Industry of New Hampshire," Economic Geography, XIV (1938), 255-270.

Cesario, Frank J. "Operations Research in Outdoor Recreation," Journal of Liesure Research, I (1969), 31-51.

Deasy, G.F. "The Tourist Industry of a 'North Woods' County," Economic Geography, XXV (1949), 240-249.

Ellis, Jack B. and Van Doren, Carlton S. "A Comparative Evaluation of Gravity and System Theory Models for Statewide Recreational Traffic Flows," Journal of Regional Science, VI (1966), 66-75.

Greely, R.B. "Part-time Farming and Recreational Land Use in New England," Economic Geography, XVIII (1942), 145-152.

Hendrick, W.O. "Recreational Use of Northern Michigan Cut-over Lands," Agricultural Experiment Station, Michigan State College, Special Bulletin 247, East Lansing, 1934.

Jones, Stephen B. "Mining and Tourist Towns in the Canadian Rockies," Economic Geography, IX (1933), 368-378.

Knetsh, Jack L. "Outdoor Recreation Demands," Land Economics, XXXIX (1963), 387-396.

Lanning, V.H. The Wisconsin Tourist, I, Madison, 1950.

Lentnik, Barry, Van Doren, Carlton S., and James, Trail R. "Spatial Behavior in Recreational Boating," Journal of Liesure Research, I (1969), 103-124.

McMurry, K.C. "The Use of Land for Recreation," Annals of the Association of American Geographers, XX (1930), 7-20.

Prophet, E.C. "The Tourist and Resort Industry," Papers of the Michigan Academy of Science, Arts and Letters, XX (1936), 385-395.

Seneca, J. J. and Cicchetti, C. J. "User Response in Outdoor Recreation: A Production Analysis," Journal of Liesure Research, I (1969), 238-245.

Seneca, J. J., Davidson, P., and Adams, F. G. "An Analysis of Recreational Use of TVA Lakes," Land Economics, XLIV (1968), 529-534.

Stedman, G. H. "Business Aspects of Vacation Travel," New York State Commerce Review, I (1947), 7-13.

Trice, A. and Wood, S. "Measurement of Recreation Benefits," Land Economics, XXXIV (1958), 363-368.

Trotter, John E. "Some Factors Influencing Attendance at Illinois State Parks," Journal of Geography, LXIV (1965), 23-31.

Wolfe, R. I. "Perspective on Outdoor Recreation," The Geographical Journal, LIV (1964), 302-335.

_____ "Summer Cottages in Ontario," Economic Geography, XXVII (1951), 10-31.

Zierer, C. M. "Tourism and Recreation in the West," Geographical Review, XLII (1952), 462-481.