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A LANDSCAPE INTERPRETATION OF A REGION OF KANSAS TO DETERMINE
ITS SUITABILITY FOR RECREATIONAL DEVELOPMENT

by

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INTRODUCTION

SOME CURRENT TRENDS IN OUTDOOR RECREATION STUDIES

Proposals for the planning of city, county, and regional parks for purposes of conservation and recreational development are wide spread throughout the country. Local, county, and state agencies have been set up in order to bring about new opportunities for recreation and the preservation of scenic beauty. On the Federal level, the creation of the Bureau of Outdoor Recreation¹ provides leadership, guidance, coordination, and assistance necessary to assure adequate planning for recreation development.

Progress on the state level is noticeable particularly in New York, New Jersey, Wisconsin, California, Massachusetts, and Michigan. Such programs involve state-wide comprehensive planning and development and the acquiring of public land to be used for parks and beaches.

There are numerous recent local and regional programs. Selected recent studies illustrate national trends and practices in the development of outdoor recreation facilities.

In Baltimore, Maryland, a previously bypassed area is being developed for scenic and recreation value and made accessible to the public by the creation of a green link between the heart of the city and country-side to the north. This is the Jones Falls Valley Plan, exhibiting a unique tying together of city and regional parks, public open spaces, and the multiple use of a scarce scenic resource.²

In Allegheny County, Pennsylvania, near Pittsburgh, a plan has been implemented to provide seven new regional parks within the next ten years.

1. The Bureau of Outdoor Recreation was created in 1962 as a semiautonomous body located administratively in the Department of Interior.

2. William H. Potts, Jr., "Baltimore Faces an Opportunity," Landscape Architecture, October 1962, 53:1:33-36.

A team of three private landscape architecture offices are collaborating in the planning and development of the system of parks. The parks are designed to provide "islands of green" in an area rapidly being overtaken by urban sprawl.³

In addition, there is a proposal for the conversion of strip-mined areas in the central states to recreation areas. Suggestions include the turning of strip-mined lands into useable recreation areas by creating "badlands," especially in the topographically monotonous Midwest.⁴

In a similar manner, the Forest Preserve District of Cook County, Illinois, has successfully taken advantage of the borrow pits which were left in the wake of Tollway and Interstate highway construction. These onetime unuseable areas are now new lakes filled with clear water, surrounded by grassy shorelines and trees. They are enjoyed by swimmers, fishermen, and picnickers.⁵

Flood-control reservoirs are providing new opportunities for outdoor recreation. Sepulveda Dam in Los Angeles, designed to control flood runoff from the Los Angeles River, will afford some 2,000 acres suitable for recreational purposes. The lands are administered by the U. S. Army Corps of Engineers with a major proportion of development being done by the Los Angeles Department of Recreation and Parks.⁶

These are but a few of the more prominent examples of recent efforts in planning for recreation and show that resources are available for this activity.

3. Philip D. Simonds, "The Birth of a Regional Park System," Landscape Architecture, April 1963, 53:3:207-208.

4. K. L. Bowden and R. L. Meier, "Should We Design New Badlands," Landscape Architecture, July 1961, 51:4:225-229. According to Bowden and Meier, a "badlands" is a barren area of grotesque erosional patterns, multi-colored claybanks, plant-fossil beds, and unfamiliar land forms.

5. Glen K. Weidemann, "Borrow Pits Can Be Assets," Landscape Architecture, January 1962, 52:2:92-93.

6. Arthur V. Potter and R. F. Bird, "Flood-Control Reservoirs Provide Recreation Area for Two Million," Landscape Architecture, October 1961, 52:1:44.

THE NEED FOR THIS INVESTIGATION

This study will be concerned, in part, with recreation needs in a region of the Southcentral portion of the State of Kansas. Its purpose will be to analyze this area through a logical interpretation of the landscape. Its objective will be to select a specific study model area thought suitable for potential recreation development. General and physical characteristics, population data, present recreation facilities, and needs and demands of the area will be influencing factors used in determining the location(s), types, uses, and effects of a development of this nature.

The Problem

There is sufficient evidence to show that Kansas parks and other recreation facilities rank below the nation's average state systems.⁷ Such services, in general, do not measure up to the future demand for outdoor recreation. The need for additional and more diversified developments of day and weekend use for local residents exists generally throughout the state.

Kansas, in some areas, has an adequate lake development program. The chief advantage of such development lies in the more extensive and deeper water areas and in providing water recreation during times when some of the smaller State lakes with more limited water may not be entirely useable. On the other hand they tend to force development of recreation areas where the reservoirs themselves are located, rather than where the development is needed. A proposal for additional outdoor recreation facilities in the Southcentral section of the state will help to create a system of parks and recreation facilities which is better balanced, both geographically and functionally.

7. Governor's Advisory Council on Recreation; Kansas Recreation, Past, Present, Future, p. 5.

The climate and topography of the study area, however, may not lend themselves advantageously to the development of water-based recreation areas of the size and scale predominate to other sections of the state. Natural recreation resources of this type are not available in this region. But, in localized areas of the region, specific micro-climatic and topographical conditions may afford the creation of other types of recreation areas.

One type is the "Intermediate Recreation Area" as defined by Marion Clawson in The Crisis in Outdoor Recreation.

It is relatively easy to get to and no more than a few hours drive for the average user. Scenic beauty and other natural advantages are desirable, but not all-important; the aim is to get the best facilities that are available without sacrificing accessibility. If necessary, quite ordinary land can be made into attractive and useful intermediate recreation areas. With the aid of a few dams (and/or dredging operations) to make artificial lakes, and some plantings and other simple improvements, land that is of low value either for agriculture or forestry can be made into quite acceptable sites for overnight camping, and other 'intermediate' recreation uses. And since there is so much flexibility in selecting locations (in some cases), the actual cost of the land might be (quite low).⁸

Increased Leisure. By 1975 the number of potential consumers of recreation and other leisure time activities will increase both because of an increase in population and because of the increase in the number of young people. This increase in population will occur primarily in urban counties. The future location of recreation facilities, therefore, should be planned to provide sufficient recreation for this increasingly large segment of the state's population.⁹ This theory, however, will not bring about the balanced and diversified system desired. Resident populations are sparse and unevenly distributed in Kansas, and do not match that of natural recreation areas.

8. Marion Clawson, Crisis in Outdoor Recreation, p. 11.

9. Glen H. Miller, Recreational and Cultural Resources, p. 6.

Although the sole use of the standard of 45 acres per 1000 population implies that the quantity of outdoor recreation area is adequate for the near future, there again is the indication of the problems of balance in the state's system of parks and other recreation facilities.

Total surface area of 161,785 acres includes land and water, lakes, state parks and other recreation areas under jurisdiction of the Kansas Forestry, Fish and Game Commission and the Kansas Park and Resources Authority. Using the standard of 45 acres per 1000 population:

1960 Kansas population census - 2,178,600. Therefore 98,000 acres is adequate.

1975 Kansas population forecast - 2,815,600. Indicates a need for 127,000 acres.¹⁰

Social Characteristics. There is some indication that a number of residents of communities in the study area may seek little in the form of outdoor recreation due to class structure, social background and/or deeply implanted tradition.¹¹ There will be, in the event of provisions for this type of recreation, a need for educating these residents to new forms of utilizing leisure time.

Culture is related to environment... (One) principle of land-use is that the culture pattern and behavior of a people are related to the natural environment that supports them.¹²

Recreation is extremely personal; it varies greatly with the character, background, and nature of the individual. Recreational values are ephemeral, devoid of tangible characteristics which can be touched, counted, or otherwise evaluated on the basis of mathematical formula or biological law.

10. *ibid*, p. 27

11. Personal interviews with area residents and County Agents.

12. Charles Callison, America's Natural Resources, pp. 167-168.

Today we no longer regard recreation as synonymous with idleness, a concept of early-day America. We understand that our forefathers... were better able to relate their efforts to their eventual goal, even though their physical effort and hours of labor were far greater than ours. By contrast, modern technology, while productive of many benefits, largely deprives the worker of personal association with the final outcome of his tasks and the personal satisfaction that gives meaning to his efforts. We are now aware that this void can be filled to a great extent by proper forms of recreation.¹³

Data collected in Area Development Southcentral Kansas Survey Highlights indicate that large percentage of the youth of these communities do not remain in or return to the community after completing their education or after discharge from the armed services. By current national social trends a high proportion of the young people of today are growing up with a background of outdoor recreation.¹⁴ It is felt that providing recreation areas close to home may serve as a means of keeping this age group in the community.

The Tourist Economy. With almost no promotional measures, tourists are spending an estimated \$250 million a year in Kansas.¹⁵ (This is 51% of the 1961 wheat crop and 37% of the entire manufacturing payroll for 1962.) A serious attempt should be made to give visitors something to do while they are here.

George E. Billings, director of Industrial Development services for Kansas Gas and Electric Company, Wichita, found that the prevalent out-of-state impression of Kansas is that the state is predominately agricultural, the land is flat, and the climate poor. The State's natural resources are abundant, many of them hardly tapped. The State's topography is not flat; it is rolling and hilly, scenic in spots.

13. Society of American Foresters, American Forestry Six Decades of Growth, pp. 148-149.

14. Outdoor Recreation Resources Review Commission (ORRRC), Outdoor Recreation for America, p. 29.

15. Governor's Advisory Council, op. cit., p. 1.

Historically, Kansas offers many examples of the tradition and cultural heritage of the nation with its numerous restorations and preservations of significant sites. Although these resources do not provide outdoor recreation opportunities in the usual sense, they may be closely associated with vacation travel and function well in conjunction with outdoor recreation provisions in the area. Such areas of historic importance are prevalent in the section of the state under study. However, man-made lakes and parks do not presently enhance the scenic and recreational aspects of this region.

Also in Southcentral Kansas Area Six Survey Highlights¹⁶ the two areas rated as least adequate in regard to community facilities and services were employment opportunities and recreation facilities. It is felt that this offers a potential raising of the level of each deficiency by providing the needed recreation facilities and at the same time affording new opportunities for employment (on a limited scale) through new developments of this nature.

It should be made clear at this point, that the area of the state in the above-mentioned survey does not encompass the entire study area. However, Rice County was selected as a representative county trade area with the resulting data being applicable to all other counties within the area.¹⁷

Apparently between five and eight percent of all family spending in the U. S. is for recreation. This includes all types of recreation. Twenty-billion dollars a year is being spent by Americans seeking the experiences associated with outdoor recreation.¹⁸ In many communities, recreation has

16. Kansas State University, Southcentral Kansas Area Six Survey Highlights, p. 22.

17. K.S.U., op. cit., p. 5.

18. Clawson, op. cit., p. 5.

become a leading industry or the leading industry. Needless to say, the probability of recreation becoming quite so important to a Southcentral Kansas community is scarce. Both socially and economically, in any location, however, recreation is becoming one of the chief uses of land, along with farming, forestry and grazing.

...uncounted numbers go on local picnics, swim in not-too-clean water, enjoy bird watching, take nature hikes, or simply view the natural world for its inspirational beauty.

Herein lies part of the importance of the grasslands in general and the western range in particular... The tragedy of the past is that recreational area of the East are inadequate or have been diverted to other uses by the encroachment of agriculture, industry, and urban development. The hope of the future is that the importance of western public land will be recognized in time to preserve and restore the recreational resources of grasslands and forests which the automobile, streamlined train, and airplane now place within reach of a large segment of the nation's people.¹⁹

A good part of needed land for recreation will undoubtedly come from the Middle West. With the Rural Recreation program²⁰ now in operation, such land may readily become available. Range-land which is considerably lower in value, may be shifted to recreation use.

Secretary Freeman²¹ in his testimony before the House Committee on Agriculture on February 7, 1962, said:

The best projections we have indicate that in 1980 the food and fiber needs of a population of 245 million people can be met by production from 407 million acres of cropland, which is 51 million acres less than the 458 million acres we classify as cropland today. The urgent problem, which requires immediate attention, is to find new productive uses for cropland. But our goal is not idle land. There is today a great unmet need for land for purposes of outdoor recreation, for wildlife habitat, for green space around our cities...opportunities for farmers to increase their own incomes and meet real needs by developing, on their own land, facilities for fishing, camping, picnicking, and other outdoor recreation challenge the imagination.

19. Callison, op. cit., p. 68.

20. U.S. Dept. of Agriculture, Rural Recreation - A New Family-Farm Business.

21. Hearing before the House Committee on Agriculture, 87th Congress, 2nd sess., on H.R. 10010, February 7, 1962, serial AA, pt. 1, p. 39, 41.

The U.S. Department of Agriculture is vitally interested in the recreation business on farms for four primary reasons: (1) it offers a chance to provide additional income to farmers and associated business, and at the same time, enables farmers to stay on their farms; (2) it can aid in diverting cropland to a more remunerative use for the owner which can later, if and when needed, be returned to cultivation; (3) it provides an urgently needed service; and (4) it helps stabilize the local economy and strengthen social institutions without removing land from private ownership or reducing the tax base.²²

METHODS OF INVESTIGATION

Following the selection of the four-county area for study, a three-day period for inspection was undertaken in order to become familiar with the total surroundings of the area, and to conduct interviews with residents and County Agents.

General highway maps supplied by the Kansas Highway Commission were used in locating landmarks, drainage areas, and other features determined to be significant to study objectives. Similarly, maps prepared by the State Geological Survey were valuable tools in indicating sources and depth of underground water resources and underlying conditions of rock formation and parent material. The analysis of these factors was significant in the interpretation of the landscape and in helping to confirm the practical selection of topography, land, and water resources best suited for recreational development.

An analysis of population composition and distribution was compiled in order to adequately determine needs and demands in the area for outdoor

22. U.S.D.A., Rural Recreation, op. cit.

recreation. This information was readily available through publications of the Kansas State University Extension Service. Characteristic habits on the national scale were assumed to parallel those of users in the area to be served, and needs subsequently determined.

The economic impact on communities which would be effected by recreational development were determined and values assessed.

Through the preceeding procedures of social, ecological, and environmental analysis, a specific topographical study model has been selected for the locations of future recreation sites.

CHAPTER I

THE REGION AND STUDY AREA

EXPLANATION OF PLATE I

Fig. 1. Deliniation of the Region.

Fig. 2. Deliniation and Location of the Study Area.

PLATE I

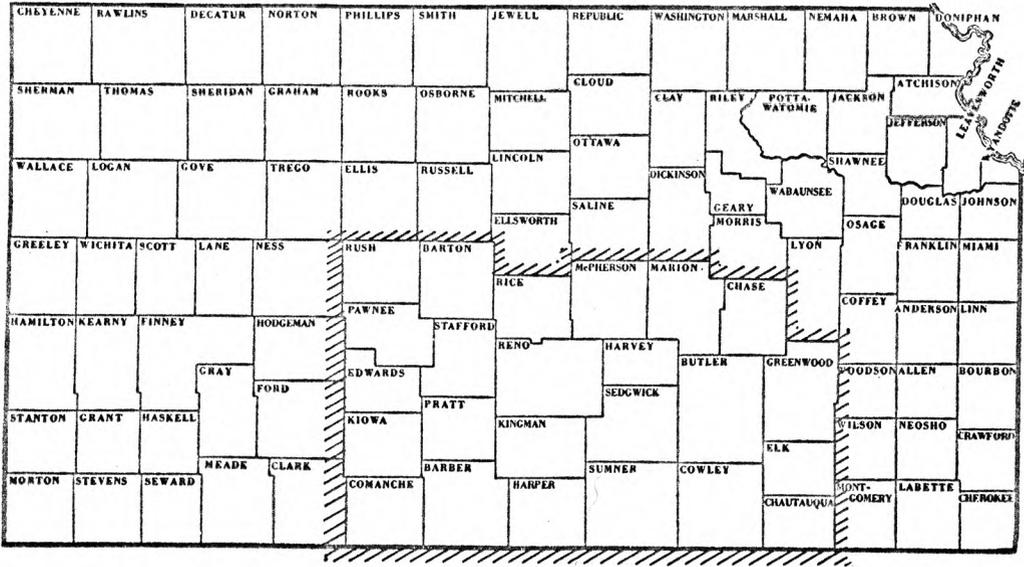


Fig. 1

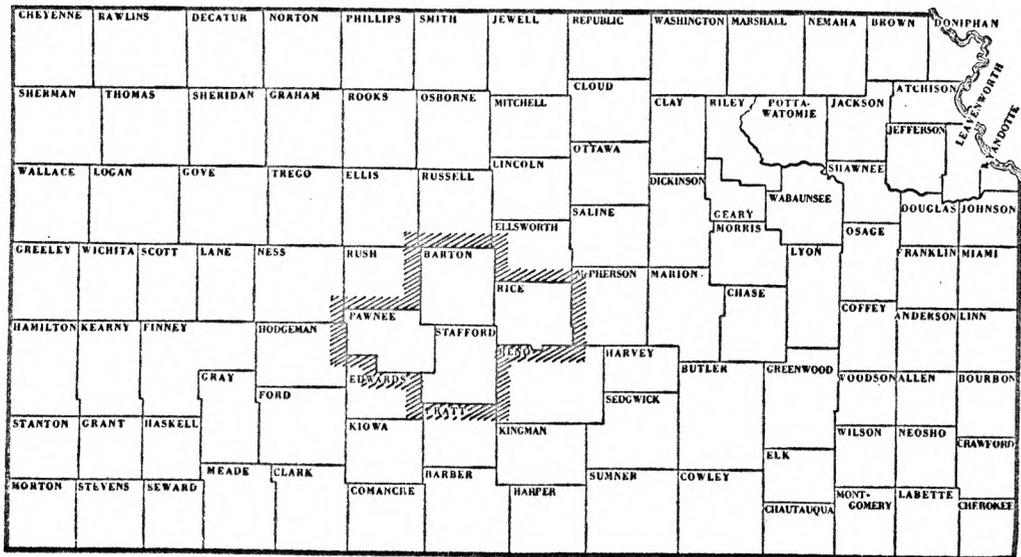


Fig. 2

THE REGION: SOUTHCENTRAL KANSAS

Region Defined

Recreation planning on a regional basis, whether in terms of geographic, political, social, or economic regions, provides a more comprehensive analysis of population characteristics and inherent resources than the consideration of individual planning units alone.

A region, by definition, "is a large and generally unified, but loosely defined, geographical area that provides the supporting base for one or more centers of population concentration."¹ Such an area would function as an independent unit.

A further breakdown of the region describes, in greater detail, internal characteristics.

The parts of a planning region are linked by common problems, common resources, or common opportunities. The people of the region are interdependent, economically and socially; they do business with each other, read the same newspapers, use the same hospitals, decline or prosper together. With widely diverse careers as individuals, people nevertheless share, in some measure, a single regional destiny.²

Comprehensiveness is the central idea in the planning of a region.^{2a}

A plan is comprehensive by virtue of the following four principles: (1) the plan applies to all land use and circulation systems; (2) the entire geographic area affected by common problems of development is included; (3) the plan is designed to meet long-range consequences; and (4) the plan is a part of a continuing process.^{2b}

1. John O. Simonds, Landscape Architecture, p. 209.

2. U.S.D.A., Yearbook of Agriculture, A Place to Live, 1963, p. 367.

2a. *ibid*, p. 371.

2b. *loc. cit.*

THE STUDY AREA: RICE, BARTON, STAFFORD AND PAWNEE COUNTIES

Basis for Selection of this Area for Investigation

Primarily, the Rice-Barton-Stafford-Pawnee county area was selected because of the apparent lack of adequate facilities for outdoor recreation and the local need for such provisions. Similarly, the need for a better balanced program for state-wide recreation facilities is indicated.³ In addition, it is felt that the area presently benefits from existing historic attractions of cultural and economic importance, and that recreation facilities when properly integrated with these historic points of interest would function beneficially.

Previous studies support the value of new opportunities for outdoor recreation in providing an economic boost to surrounding communities.⁴ This was an additional consideration in the choice of location, since the economy of the area is being seriously impaired by a current dwindling population.⁵

Also considered were the presence of major east-west transcontinental highways and the proposed Interstate system which will traverse the area immediately north. These will adequately serve as convenient access to new recreation areas which should be planned to utilize their location and orientation.

Land considered unproductive and unsuitable for agricultural use frequently exists in local areas. Generally, these sections of land have a very high water table with an abundance of subsurface water. This is a prime consideration with the lack of other water recreation resources.

General Description

Kansas, for purposes of economic studies, surveys, and social planning, has been divided into six major sections, each with similar internal economic,

3. Miller, op. cit.

4. ORRRC, Economic Studies of Outdoor Recreation, Report No. 24.

5. K.S.U., Southcentral Kansas Area Six Survey Highlights, op. cit, pp. 9-10.

climatic, and historical characteristics.⁶ The area called Southcentral Kansas in this investigation comprises 24 counties including the study area; it includes the metropolitan trade area of Wichita, a major proportion of the producing oil fields, major wheat counties in the west, and prime Bluestem grazing land in the east.

A general description of the four-county area within the Southcentral Kansas region will be of value and have important bearing on the factors influencing selection of the study area for a landscape interpretation and its suitability for recreational development.

The area is generally bisected by a major east-west transcontinental highway (U.S. 56) and will, with the completion of the Interstate System, be within a one-half hour drive of I-70, north of the area.

These counties also have a number of historic attractions, of both national and local interest. The old Santa Fe Trail roughly follows or parallels U.S. Highway 56 through the region.

Approximately 100 miles due south of the geographical center of the 48 states (near Smith Center, Kansas), Rice, Barton, Pawnee and Stafford counties are located nearly in the center of the state. The region is agriculturally based and covers an area of 3178 square miles; Rice with 724 square miles, Barton with 900 square miles, Pawnee with 756 square miles, and Stafford with 798 square miles. Major cities in each county are Lyons, Great Bend, Larned and St. John, respectively, with the urban population of these cities exceeding 29,500.⁷ The four-county area had a 1960 population of 65,257. A detailed breakdown of population composition is shown in Table 1.

6. Kansas University, Economic Development in South Central Kansas, Vol. 2-7.

7. U.S. Dept. of Commerce, Bureau of Census, 1960 Census of the United States.

Table 1. Population composition of the counties in the study area.

County	Area (in sq. miles)	Total Population	Population per sq. mile	% Population under 18 years of age	% Population 18 - 64	% Population over 64
Rice	724	14,021	19.3	34.4	52.5	13.2
Barton	900	34,226	37.4	38.7	53.3	8.0
Pawnee	756	9,268	13.7	29.9	54.9	15.2
Stafford	798	7,643	9.4	32.7	53.1	14.3
(Total)	3,178	65,157				
Kansas		2,178,600	26.6	34.4	53.6	11.0
U. S.		179,325,671		38.5 (under 20)	52.6 (20-64)	9.1

County	% of Total pop. urban	% of Total pop. rural-nonfarm	% of Total pop. rural farm	1950 - 1960 % change in pop.	Median yrs. education for pop. over 25
Rice	33.0	46.9	20.1	-11.0	12.0
Barton	73.1	14.9	12.1	8.2	11.8
Pawnee	48.8	29.3	21.9	-7.1	11.3
Stafford	*	69.6	30.4	-15.5	11.3
Kansas	61.0	24.3	14.7	14.3	11.2
U. S.	69.8	22.7	7.5	11.1 (approx.)	10.6

County	% of employed persons in white collar occupations	% of employed persons in manufacturing industries	% families with income less than \$3000 in 1959	Median family income in 1959, for total pop.
Rice	36.0	4.4	20.6	4946
Barton	40.2	8.2	16.3	5654
Pawnee	33.4	2.7	22.1	5174
Stafford	28.8	3.7	32.2	4404
Kansas	41.8	16.6	22.3	5295
U. S.	20.7	27.1	21.4	3667

* No center as large as 2500 persons in 1960.

Population Characteristics

The population composition of the area is one of the primary factors in determining the needs and demands for recreation facilities. The need has been expressed but demands are yet to be analyzed relative to type, size, and location of these facilities. These related factors will depend, in part, on population distribution, age, income, and occupation of those who will be using these facilities in the future.

Table 1 has been compiled, in part, with the aid of some of the data from a collection of maps in Statistics for Kansas Counties.⁸ The table shows that Barton County, with the major proportion of the population, is experiencing growth while Rice, Pawnee and Stafford are declining in population. However, consideration must be given to the fact that the communities over 1000 population of the area have, without exception, sustained growth during the past decade (ranging from 1 to 8 percent). The communities under 1000 population have, without exception, sustained losses (ranging from 1.5 to 19.5 percent).⁹

The number of farms in the area has been declining since 1900 at an increasingly rapid rate. "As the trend in agriculture on-the-farm employment continues downward, manufacturing employment (should) continue to assume a progressively larger role in the area's economy."¹⁰ One of the conclusions that has been reached is that provisions for outdoor recreation will also add to the area's economy through the creation of new jobs.¹¹

8. Kansas State University, Extension Service, Statistics for Kansas Counties.

9. K.S.U., Southcentral Kansas Area Six Survey Highlights, op. cit., p. 19.

10. *ibid*, p. 29.

11. Clawson, op. cit.

The communities of the area may be regarded as social magnets, drawing people in from a surrounding hinterland for various goods and services. As the rural population has declined, many communities have sustained losses in trade and demand for other services. This change has been especially hard on the smaller communities since the area population to be served is not only smaller but more mobile; it is now able to travel greater distance to market its produce and purchase needed goods and services. The larger communities which offer a greater variety have a greater drawing power.¹²

Data for the southcentral four-county area show that the age grouping 20-29 is conspicuously small -- this is one of the most economically productive periods and it is obvious that the young people are not returning to the area once they have left. Adults of child bearing age are migrating out of small communities, leaving a population of older residents.

Replacement or alternative use can be found for a large number of the resources which disappear or become obsolete, but when the main resource, young people, lose interest, steps must be taken to provide a stimulation for growth.

Characteristics of the Study Area

This section is devoted to the description and characteristics of the entire four-county area. A comprehensive analysis on interrelationships of these characteristics and their bearing on potential site selection will appear in the section on needs and demands.

Suitability of land for use in recreational development must be determined prior to the selection of specific areas for recreation use. This may be accomplished by a system of classification of resource types which are composed of interrelated ecological characteristics such as slope, topography, land forms, flora, fauna, accessibility, scenic quality, land use, history and geology.¹³

12. K.S.U., Southcentral Kansas Area Six Survey Highlights, op. cit., p. 18.

13. G. A. Hills, The Ecological Basis for Land-Use Planning.

These counties, located generally in the middle one-third of the state, have an elevation ranging between 1200 feet and 2000 feet. There is an annual average precipitation of 24.18 inches.¹⁴ The area is conducive to plant growth because of the high proportion of sunny days. The range of temperatures is great with a July average of 80 degrees, and a January average of 31.4.¹⁵ There is also a greater range between day and night temperatures when compared to the eastern third of Kansas. The average growing season ranges from 170 to 180 days.

South of the Blue and Smoky Hill uplands is a large, flat area known as the Great Bend Prairie, lying largely in the great bend of the Arkansas River, but reaching northeastward to McPherson.¹⁶ A large portion of the counties of Rice, Barton and Pawnee, and all of Stafford lie within this area. Parts of this area are sand dunes or are covered by small hummocky hills that once were sand dunes. Essentially, the land is undulating to gently rolling. The dominant species of vegetation here are grasses, "but in some areas, particularly in the northeastern and southwestern parts, there are relatively large areas of bare sand that will not support much vegetation."¹⁷

Grasses are found in almost all of the common habitats of the area such as the prairies, the plains, the sloughs or swales, the wet meadows or marsh lands, sand dunes and sandy wastes, salt marshes, alkali flats and stony hills. Along the fringes of the bottomlands of the Arkansas River, cottonwoods and willows are prevalent. Scenic qualities here are given added emphasis by the

14. Bruce F. Latta, Geology and Ground-water Resources of Barton and Stafford Counties, Kansas, p. 14.

15. Kansas University, Economic Development in South Central Kansas, op. cit., Vol. 2, p. 16.

16. Frank C. Gates, Flora of Kansas, p. 7.

17. Latta, op. cit., p. 45.

marked contrast with the surrounding open plains. Essentially the same picture is repeated, on a smaller scale, along the tributary streams. These include the Pawnee and Little Arkansas Rivers, and Walnut, Cow, Rattlesnake, Peace, and Ninnescah Creeks. Generally, however, these bodies of water do not contain a substantial amount of water for use as a recreation resource. Late spring and early summer rains account for maximum flow previous to the remaining year-round period of normal flow.

Subsurface water is abundant in this area and is used for crop irrigation. The water table is relatively high and may offer a greater potential resource for water based intermediate recreation areas than existing natural bodies of surface water.

Soils play a noticeably important role in the development and economy of the area and therefore become a prime consideration in the interpretation of the land for recreational uses.

The following are the major soil groups of the region: The Western Residual soils predominate in the general farm area of central Kansas. These soils have been formed from limestone, sandstone and shale. The topography varies from level to rolling, with occasional hills adjacent to the larger streams. Soils formed from the Dakota Sandstone are relatively shallow, relatively low in plant-food nutrients, and droughty in nature. The light soils of the Outwash Plains occur in the southeastern section of this area and are quite sandy. There are many local areas where the sand is subject to blowing. The major area of Dune Sand soils occurs south of the Arkansas River in the Great Bend region. These soils are naturally limited primarily to grazing purposes.¹⁸ (See Fig. 3.)

18. K.U., op. cit., Vol. 2, pp. 11-12.

EXPLANATION OF PLATE II

Fig. 3. Major Soil Groups of the Study Area.*

*Source: Kansas Board of Agriculture, Twenty-eighth Biennial Report,
Vol. XXXIII, p. 100.

PLATE II

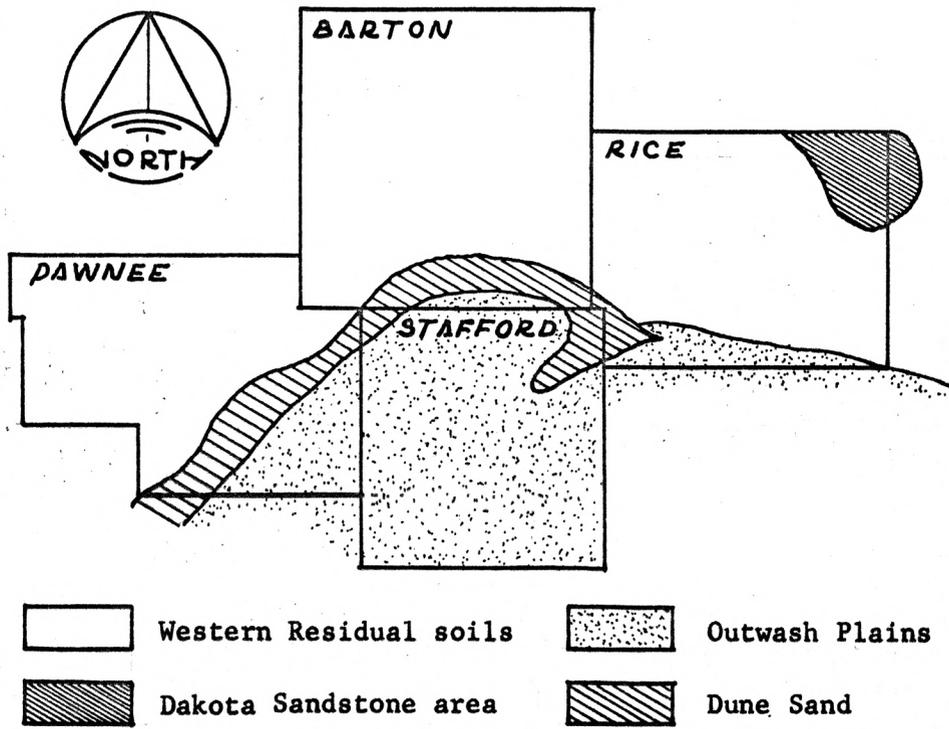


Fig. 3

Geology and Ground Water Resources

The following is a description of geology and ground-water resources.

Barton and Stafford Counties.

All the rocks exposed in Barton and Stafford Counties are of sedimentary origin and range in age from Cretaceous to Recent... In northern and western Barton County thin deposits of "Algal limestone" of Tertiary age crop out in scattered locations.¹⁹

The alluvium yields large amounts of water to wells in Arkansas and Walnut Valleys and small to moderate amounts to wells in Cheyenne Bottoms and smaller stream valleys... Waters in most places are hard but otherwise are satisfactory for most purposes. However, waters of poor quality are found in Cheyenne Bottoms and Big and Little Marshes (Stafford County).

Sand and gravel beds of the Meade formation are the most important source of water in Stafford County and southern Barton County, and yield large supplies... In most areas the water is of good quality, but locally it is highly mineralized.²⁰

Pawnee County.

The rocks that crop out in this area range in age from Cretaceous to Recent. The Cretaceous rocks are exposed in the upland areas in northern Pawnee County... The alluvium and terrace deposits underlie the principal valleys and the adjacent areas and dune sand covers the large area lying south of the Arkansas Valley. The alluvium in Pawnee and Arkansas Valleys and the Meade formation which underlies the dune-sand area, yield large quantities of water to wells...

The ground-water reservoir is recharged principally from rain and snow that fall within the area, by percolation from streams and depressions, and by underflow from adjacent areas. Ground water is discharged from the ground-water reservoir by seepage into perennial streams, by transpiration and evaporation, by movement into adjacent areas, and by wells.

Ground water in the Pawnee area generally is hard, but is suitable for most uses... The formation that yields the largest quantities of the most suitable water is the Meade formation down to and including the Permian redbeds.²¹

19. Latta, op. cit., pp. 9-10.

20. Loc. cit.

21. Thad G. McLaughlin, Geology and Ground Water Resources of Pawnee and Edwards Counties, Kansas, p. 9-10.

Rice County.

All the exposed rocks in Rice County are of sedimentary origin, ranging in age from late Permian to Quaternary... The sand and gravel of the Pleistocene Series, and the sandstones of the Dakota formation and of the Kiowa shale of the Cretaceous System are the most important aquifers in the area...

...The water is moderately hard to hard over most of the area. Water with a high chloride content is found in some of the Permian rocks, in deep Pleistocene channels, and in shallow deposits near points of disposal of highly mineralized industrial wastes.²²

Wildlife

Characteristics of wildlife of the plains area distinguish it, as a group, from the forest wildlife. More than 300 varieties of game and song birds and well over 450 species of wildflowers are native to parts of these plains and prairies.²³

History

Historically, the Southcentral Kansas area was settled during the late 1800's in such a manner that the county seat of local government was geographically located so a resident could make a complete round trip (via horse and buggy) to the county seat in one day. Small communities grew up in strategic locations to serve the surrounding agricultural area. The pattern remains largely unchanged to the present date.

22. O. S. Fent, Geology and Ground-Water Resources of Rice County, Kansas, p. 7.

23. National Park Service, Recreation Today and Tomorrow, p. 30.

CONCLUSIONS ON THE POTENTIAL RECREATION RESOURCES OF THE AREA

Topography and Land Forms

The gentle to moderately rolling topography of the area affords limited use to the possibilities of impounding water in natural basins. These desired land forms do not exist where facilities are needed, they do not contain sufficient water for use, nor do they exist where land is available. The Arkansas River Basin is a wide, shallow, alluvial plain, far exceeding the practical limitations for a water impoundment of the scale intended. This fact, when coupled with the evidence of a general lack of constant water flow in the Arkansas River and its tributaries, confirms that these bodies of water may, for purposes of impounding water for recreational use, be of limited use. However, the wooded areas bordering the river may have a potential for development as limited use areas for activities such as picnicking and overnight camping, and the creation of a parkway system through this section might well serve to tie together successive intensive use areas.

Soils

Soils of the area are one of the controlling factors in locating sites for recreational use. Thus, soil unsuitable for agriculture may support recreation use. The general area south of the Arkansas River in Barton, Stafford, and Pawnee Counties (the dune sand soils of the Great Bend prairie) is generally considered unsuitable for cultivation but is suited to grazing or woodland with moderate to severe restrictions in use.²⁴ These soils are generally loose sands and sand hills with a few areas of poorly drained, tight, clay soils.

24. U.S.D.A., Soil Conservation Service, and Kansas Agricultural Experiment Station; Barton, Rice, Pawnee and Stafford County Reconnaissance Soil Conservation Survey Maps.

Concerning the land form,

The Great Bend prairie in general is poorly drained. The rainfall over a large part of this area collects in the numerous basins and hollows where a part of it seeps into the ground and the remainder is lost through evaporation and transpiration.²⁵

It is felt that through analysis of soil classifications and land capabilities supported by the soil survey maps published by the Soil Conservation Service of the U.S.D.A.,²⁶ the selection of land termed unsuitable for profitable use in agriculture may be utilized in an effective manner for recreation.

Subsurface Water

The topography of the area usually controls the general shape and slope of the water table. The general surface of the ground water body is modified by differences in the permeability of the surface and subsurface material. "A hill in the water table may be found under sand-dune areas, because of the high rate of ground water recharge made possible by the permeable nature of sand."²⁷

...Adequate supplies for industrial, municipal, and domestic use can be developed at almost any point in this (Arkansas River Valley) area... Dune sand, terrace sand, and gravel exposed at the surface provide excellent facilities for recharge from precipitation. The water table is from 7 to 10 feet below the surface in most places...²⁸

Data on subsurface water resources have been stressed, for it is evident that, through the preceding analysis of the geology of the area and the formations which spawn ground water resources, this source of water has become the prime recreation resource of the area.

25. Latta, op. cit., p. 47.

26. U.S.D.A., Soil Conservation Service, op. cit.

27. Fent, op. cit., p. 25.

28. *ibid*, p. 79.

Accessibility

Accessibility to virtually any future site selections in this area will offer few problems. Numerous hard-surface primary and secondary roads exist throughout these counties and are in excellent repair.²⁹ This, coupled with the existence of major transportation routes through the area, will put new recreation areas within easy reach of users. In addition, increased accessibility would be afforded by the creation of a parkway system to tie recreation facilities together and to conserve potential areas of scenic interest.

PRESENT RECREATION FACILITIES

Before attempting to predict local needs and demands for outdoor recreation, information must be gathered relating to types and location of recreation facilities presently in operation in the area. With this procedure, the duplication of existing parks and recreation programs in the same area will be eliminated.

Locally

On the local scale, several small city parks exist in the larger communities. These, of course, serve only limited numbers and are used, generally, for active recreation such as spectator-oriented sports and playground activities. Ball-fields and playgrounds number only four in the entire area. There are three golf courses, all in Barton County. ^{INCORRECT} These, however, are private clubs and are not available to the general public. Also, this form of recreation does not provide interest to a large segment of the recreating public.

29. State Highway Commission of Kansas, Highway Planning Department, Highway Sufficiency Rating Survey.

Adequate swimming facilities are virtually non-existent with the major source for this activity being several of the numerous abandoned and undeveloped sand pits in the area. Similarly, areas of water of adequate size for boating are not available.

Regionally

On the regional scale, recreation opportunities of a different type are prevalent. These again are used by a limited number of people who enjoy seasonal outdoor activities such as hunting. Five miles north between Great Bend and Ellinwood (Barton County) is the Cheyenne Bottoms Waterfowl Refuge, a public shooting grounds and wildlife study area. Covering approximately 18,600 acres with water maintained on approximately 15,000 acres, Cheyenne Bottoms is a natural depression about six miles wide and ten miles long. The Great Salt Marsh area in Stafford-Rice-Reno counties, northeast of St. John (Stafford), is being developed into a national wildlife refuge by the U.S. Fish and Wildlife Service. Approximately 20,000 acres on Rattlesnake Creek will be included in the refuge. Portions of the refuge are open for hunting.

Sightseeing or driving for pleasure, an altogether different form of recreation, has become the leading recreational activity in the nation today.³⁰ Features of historic interest are prevalent in these counties, Barton and Pawnee in particular. Such areas attract national attention and are visited regularly by vacation travelers. There is reason to believe, however, that these facilities are visited rather infrequently by local residents and therefore do not presently play an important role in the overall local recreation program.³¹

30. ORRRC, Report to the President, op. cit., p. 34.

31. Interviews, op. cit.

Prominent historic sites include Ft. Larned, a National Historic Landmark near the city of Larned (Rice); ^{PAWNEE} the site of Old Ft. Zarah, a historic marker and roadside park maintained as a State Park near Ellinwood (Barton); Pawnee Rock, a famous landmark on the Santa Fe Trail in the city of Pawnee Rock (now a State Park); and a 30-foot cross of granite near Lyons (Rice) placed as a monument to a Spanish explorer seeking the "Kingdom of Quivera."³² Historic markers further telling the story of the settling of the West are located along major highways -- especially on U. S. 56, the Old Santa Fe Trail.

Roadside rest areas and wayside parks are well located and generally have complete facilities for comfort and relaxation. Additional provisions of this type might support those in existence as well as functioning advantageously with future outdoor recreation sites.

NEEDS AND DEMANDS

Needs and demands for outdoor recreation facilities should be planned with the consideration of all materials discussed previously. Each segment relates directly or indirectly to a correlation of needs for all population types. Some, for example, will desire restful, quiet types of recreation while others, depending on age, sex, occupation and income, may seek one of the many other forms of active or passive outdoor recreation.

Equally as important as the magnitude of demand is the way in which it is distributed among the groups within the population. There are significant differences in the desires for outdoor recreation between young and old, rich and poor, city people and suburbanites. The groups themselves, furthermore, are changing -- incomes are rising, the older are living longer. A projection of these trends cannot foretell the future, but there are important clues here indicating the new order of needs.³³

32. Santa Fe Trail Highway Association, Take a Santa Fe Trail Trip.

33. ORRRC, Report to the President, op. cit., p. 27.

Influencing Factors

1. Age. Of all the factors, this has the greatest influence. The older people become, the less they engage in outdoor activity.

2. Income. Participation is higher in the upper income groups. In general, participation tends to increase with income; the jump is sharpest at about the \$3000-a-year mark; from there on, participation steadily increases, reaching a maximum in the \$7,500-\$10,000 bracket, declining slightly thereafter.

3. Education. The more education a person has, the more active he is likely to be.

4. Sex. Participation does not vary by sex as much as by age or income, but in total, men do tend to participate more than women -- a difference largely attributed to the strong interest men show for traditionally masculine pursuits.

5. Family. Families turn to activities in which children can participate along with the parents.

6. Occupation. Professional people enjoy the most recreation; farmworkers the least. This may be attributed not so much to the work a man does but rather to how much he is paid and how long a vacation he has. (Few farmers enjoy paid vacations.)

7. Region. By region, there is not much difference in the amount of recreation people do. (The type of recreation participated in, however, depends on the resources available in the region.)

8. Urban-rural. Suburbanites and people who live in the country participate more than city people. Ease of access tends to promote use.³⁴

The influences on recreation participation in the section of Kansas under consideration are assumed to closely parallel the influences of a cross-section

34. Derived from ORRRC, Report to the President, *ibid*, p. 27-29.

of the nation. The major dissimilarity in existing participation habits may be attributed to environmental characteristics and lack of inherent recreation resources. With the development of facilities for outdoor recreation in the area, it is believed that these characteristic habits will closely follow the national average.

Consideration of the factors that will affect demand must include supply. What people do depends greatly on what is available for them to do. The opportunity to try an activity is a necessary stimulus, but once experienced, it can set off a powerful spiral. To a degree that is hard for anyone to foresee, the sheer existence of new recreation facilities can stimulate people to use them, to try new activities, and this in turn leads them to seek still more. Water, especially, is a stimulus, and where none was before, the effect is galvanic.³⁵

Thus, demand is one element of a system. Analysis of the preferences of individuals and groups can indicate the directions and amount of the total demand. These, together with the other elements of the system such as the location of recreation areas and the way the available resources are used, produce a pattern.

It would be desirable to wholly fulfill the recreation needs and wants of all the people; that is, to offer a complete selection of recreation opportunities and experiences. A full complement of services, however, refers only to those one would normally expect to find in a region. One does not expect to find ski slopes in Florida or in level areas such as the study area. Similarly, some parts of the study area lack sufficient resources of recreation interest to warrant development effort. Consequently, placement of these areas, while considerate of population distribution, composition, and needs, will be somewhat limited by the supply and location of sufficient resources.

In this connection, it will be helpful to describe a comparative analysis of the previously listed national factors of recreation participation habits,

35. ORRRC, Report to the President, op. cit., p. 32.

with those expected of users of newly developed recreation provisions in the study area. Table 1, page 7, will be used as the basis for this comparison and conclusions drawn by relative data compiled by the Outdoor Recreation Resources Review Commission.

Prior to specific comparisons, some basic factors should be considered in relation to how great the future demand will be. The most basic factor will be the number of people.

Barring a war or other catastrophe, it seems very likely that the population will virtually double -- from about 180 million today to approximately 230 million by 1976, and to 350 million by the year 2000.

It will be a more concentrated population; compared to 63 percent in 1960, about 73 percent of the people will be living in metropolitan areas by the year 2000. There will be more young people. The proportion of those in the 15-24 age bracket, the most productive of all, will go from the current 13 percent of the total to about 17 percent by 1976.³⁶

This suggests a doubling of demand by the year 2000, even if the current rate of participation were to remain stable. However, studies indicate that trends in the future will find the individual participating still more than he currently does due to factors of increased income, leisure and mobility.³⁷

"Between the years 1960 and 2000, when the nation's population is expected to double, participation in outdoor pursuits will nearly triple."³⁸ In the study area, however, predictions of total increase in demand are unforeseeable since virtually no provisions for outdoor recreation opportunities presently exist. The indications are that as recreation opportunities become available, they will be utilized to an ever increasing extent by those finding new experiences in outdoor activities.

36. *ibid*, p. 30.

37. *ibid*, p. 30-31.

38. *ibid*, p. 32.

Preferences in types of outdoor activities depend, in part, on the factors of age, sex, occupation, accessibility, income, etc. The Outdoor Recreation Resources Review Commission found in its studies that Americans seek most the simplest and least costly forms of outdoor recreation.

Listed in order, Table 2 shows the top 14 outdoor activities in which Americans participate the most.

Table 2. Time spent in outdoor activities³⁹

Activity	*Number of activity days per person, 12 yrs. and over. (June 1960-May 1961)
Driving for pleasure	20.73
Walking for pleasure	17.93
Outdoor games or sports	12.71
Swimming	6.47
Sightseeing	5.91
Bicycling	5.15
Fishing	4.19
Attending sports events	3.75
Picnicking	3.53
Nature walks	2.70
Boating	1.95
Hunting	1.86
Horseback riding	1.25
Camping	.86

*The number of instances (portions of a day) in which the individual participated in a particular activity over a one-year period.

The remaining activities listed by ORRRC are generally associated with winter sports and are inapplicable to the study area.

39. *ibid*, Table 1, p. 212.

Factors Influencing Preference

Age. In all but one activity, the age group 12-17 shows the highest rate of participation while a corresponding decline is evident with increased age. The rate in number of days of walking for pleasure, though, again begins to rise as age increases.

At the present time, approximately 34 percent of the total population of the study area are under 18 years of age, with 53 percent between 18 and 64, and 13 percent over 65.

Education. In the case of swimming, playing games, sightseeing, walking, and driving for pleasure, those with the most education are most active. In other activities, the correlation is not very consistent. The median level of education for those over 25 in the study area is 11.6.

Income. The very low rate of participation by the lower income groups may be attributed to the high proportion of older, retired people in this bracket. Participation is higher among those who have the leisure and resources to participate. Increase in participation makes the sharpest jump at the \$3000-a-year level. Roughly 23 percent of the study area population realize a family income of less than \$3000. The 1959 median family income for the entire area is \$5045. Barton County, with 73.1 percent urban population has a median family income of \$5654. On the other hand, Stafford County, with no center as large as 2500 persons, showed a 1959 median family income of \$4404.

Sex. As previously indicated, participation does not vary much by sex. There is not sufficient information available to determine the ratio of male to female population of the study area. This particular factor, it is felt, will have little effect on the demand for potential recreation facilities.

Occupation. While the area is agriculturally based, relatively few of the total population are involved in actual farming operations. Twenty-one

percent reside in what are termed rural-farm areas. Approximately one-third of the total four-county population who are employed are in white collar occupations.

Distribution. Non-urban persons participate more than urban persons. This may be partly due to the ease of access. Suburbanites and country people are generally located within a short distance of outdoor recreation facilities. With the increased mobility and presence of adequate highways and secondary roads throughout most of Southcentral Kansas, access will offer few problems and put recreation areas within easy reach of all the population.

Conclusions

With several exceptions, it is assumed that recreation demands in the study area will follow corresponding patterns to those of the ORRRC survey findings. One noticeable difference will be found in the urban influence. By population standards and descriptions, communities such as Great Bend are urban. Being comparatively small in area, however, and with a predominately agricultural land use, their character is typically rural and suburban. These communities depend, for the most part, on agricultural commodities and other products of natural resources as their economic base.

These socio-economic characteristics, then, provide the background necessary for determining needs and effects and are essential for a comprehensive analysis. The association of these factors together with an analysis of physical characteristics and present land use within the area will result in the selection of a study model for recreational development.

CHAPTER II

SELECTION OF A STUDY MODEL

CLASSIFICATION

The intermediate recreation area has been described as one which provides relatively quick and easy access, may utilize average land or land of low value, does not require inherent scenic beauty and other natural advantages, and makes use of available facilities.¹

The Outdoor Recreation Resources Review Commission has classified recreation areas into six groups, each with distinguishing characteristics. Recreation facilities to be planned for the study area should fall within the Class II group.

General outdoor recreation areas (Group II) utilize natural resources for the specific recreation activities for which they are particularly suited, irrespective of location. Generally, they are readily accessible and are equipped with a wide variety of man-made facilities, which may vary from the simple to the elaborate. Although use is often heavy, it seldom has the "mass" feature characteristic of Class I.²

Together with the previous factors of general physical characteristics, social considerations, and public needs for different kinds of recreation activity, micro-physical characteristics and economic impacts are to be considered and evaluated in locating sites for recreation within the planning area.

As a study model, the dune sand topographic type has been selected.

PHYSICAL CHARACTERISTICS

Topography

In localized sections of the four-county study area, there are areas of dune sand and dunelike topography, and loose sand and sandhill soils. These

1. Clawson, loc. cit.

2. ORRRC, Report to the President, op. cit., p. 117.

land types are classified as VI; not suitable for cultivation but are suitable for grazing or woodland with moderate restrictions in use, and Class VII, suitable for grazing or woodland with severe restrictions in use.³

Class VI, Loose sands and sandhills group.

This soil group is confined to the sandhills areas in the southern portion of Barton (and Rice Counties, along the banks of the Arkansas River in Pawnee County, and is confined to the sandhills area in Stafford County... The topography is a succession of dunes or rough hummocky low hills and depressions. The dunes vary from 10 to 20 feet in height. There is practically no surface drainage due to the porous nature of the sand.

These lands are unfit for cultivation due to rough topography, low fertility, droughtiness, and wind erosion hazards...⁴

Class VII, Loose sands and sandhills group.

This group occupies portions of southeast Barton and Rice Counties, east of the Arkansas River in Pawnee County, and in the sandhills area and along Rattlesnake Creek in Stafford County.

The loose sands and sandhills areas of Class VII...have typical dune relief and consist chiefly of loose...fine sands covered by a moderate stand of bluestem and sand dropseed grasses.

The sandhills are the most extensive type of grazing land (in each of the four counties); and their misuse can easily create a hazard to nearby cultivated land. It is essential, therefore, that considerable care be given to obtain their proper use in order to get the highest production of grasses under conditions which will not allow damaging erosion to take place. On all the lands of this type which have no vegetative cover or have a poor stand of grasses, some sort of growth cover such as sudan or a sweet sorghum should be planted at the first favorable opportunity.⁵

3. U.S.D.A., Soil Conservation Service, Physical Land Conditions Affecting Use, Conservation, and Management of Land Resources. (One publication for each of the four counties in the study area.)

4. *ibid*, Barton County, Kansas, p. 17.

5. *ibid*, p. 18.

Land use.

Table 3. Present use of land in land-capability Class VI and VII.

Class VI, Loose sands and sandhills group				
County	Cultivated (acres)	Native pasture (acres)	Woodland (acres)	Total (acres)
Rice	2,540	20,871	72	23,483
Barton	4,537	4,976	125	9,638
Stafford	8,957	33,025	661	42,823
Pawnee	1,037	970	1,017	3,024
Total	17,051	59,842	1,875	78,968

Class VII, Loose sands and sandhills group				
County	Cultivated (acres)	Native pasture (acres)	Woodland (acres)	Total (acres)
Rice	790	13,322	7	14,119
Barton	1,822	1,996	1,579	5,397
Stafford	2,812	5,016	385	8,213
Pawnee	10,241	12,215	3,735	26,191
Total	15,665	32,549	5,706	53,920

Source: Compiled from United States Department of Agriculture, Soil Conservation Service and the Kansas Agricultural Experiment Station cooperating, op. cit., Rice County, p. 23; Barton County, pp. 21-22; Stafford County, p. 18; Pawnee County, pp. 21-22.

These land types which are significant to this study are shown, generally, in Fig. 3, but they may be precisely located with the use of the maps contained in the Appendix. These are Reconnaissance Soil Conservation Survey maps⁶ and show generalized classes of land according to use capability. Maps showing present land use in detail are available from the same source but are not included here.

6. U.S.D.A., Soil Conservation Service, op. cit.

Major recreation sources. Sand dune topography is typified by moderate slopes and hills separated by small basins. The Meade formation, which is the prime source of water in the area, is covered by a few feet to more than 50 feet of dune sand.

Sand and gravel beds of the Meade formation are the most important sources of water in Stafford County and southern Barton County (and in Rice and Pawnee Counties), and yield large supplies... In most areas the water is of good quality, but locally it is highly mineralized.⁷

The water table is shallow, being less than 25 feet below the surface except beneath the highest sand dunes. "The sands and gravels of the Meade formation beneath the Great Bend prairie are highly permeable and capable of yielding large supplies of water..."⁸

This type of land is available in large quantity and is predominately under agricultural land use of low intensity or in pasture or woodland. (See Table 3.) To this extent, these lands offer a great potential for recreation development. Subsurface water is abundant and its availability for recreational use should require relatively moderate alterations of the land.

Dune landscape. The dune sand and sandhills areas have a potential natural uniqueness and should lend themselves well to the adaptation of recreational development.

Warner Marsh, in Landscape Vocabulary, describes a dune as

A hill or drift of sand or loess formed by the wind. Until their surfaces are fixed by the growth of vegetation, dunes move slowly with the wind, which picks up particles on the windward side, depositing them on the lee side... Dunes are the environment of many specialized organisms which are adapted to their arid conditions.⁹

7. Latta, op. cit., Table 6, p. 50. (Geologically, the Meade Formation is a subdivision of the Pleistocene Series in the Quaternary System.)

8. *ibid*, p. 141.

9. Warner L. Marsh, Landscape Vocabulary, p. 119.

EXPECTED ECONOMIC EFFECTS RESULTING FROM RECREATIONAL USE OF THE LAND

The designation of the previously described lands as recreational lands can bring important changes to both the large population centers and to rural communities of the area. Grazing acreage may be decreased to some extent with the shift of land into intermediate or Class II day-use recreation areas, but not to the extent that changes in community character or population will result. Expected new developments will generate other types of business and job opportunities which will supplement and build the economic base rather than limit it.

For example, positions will be created in the development, administration, and maintenance of new recreation areas. With the initiation of such facilities on these lands rural communities especially would find improved business conditions with the increased need for motel, restaurant, and other businesses to serve tourists and visitors. With proper planning, desirable recreation can be provided and should result in increased local land values. It is also probable that new markets for local farm products will arise.

New employment possibilities for rural people will be provided by several means: (1) there will be a need for people in the construction, operation and maintenance of new recreation areas; (2) in the case of privately developed recreation businesses, possibilities for self-employment will arise; and (3) there will be opportunities for employment in private businesses which supply goods and services to recreationists. Some skilled and professional people will be required, but rural persons are generally hard workers and are very adaptable to a wide variety of skills. Therefore, many will have the qualifications for numerous employment opportunities which will become available within and associated with the recreation area.

Provisions for recreation can also favor the introduction of new industry

to the area, thereby affording new opportunities for employment and economic growth.

Initially, then, a desirable or preferred type of recreation must be provided as well as supporting services which will afford comfort and convenience to visitors. Also of prime importance to effective use are factors of accessibility. Roads play an important role in bringing visitors from more distant points.

While the design and location of roads for efficient and safe transportation is clearly of high priority, other considerations merit recognition. Travel to reach outdoor recreation facilities is a major use of many of our highways. Roads and highways are multiple-use structures serving a variety of public purposes, and outdoor recreation is an important one of these purposes.¹⁰

Along with the shifting of land use will come new use of roads in the area. A road to a scenic spot or to a recreation area may be more valuable to the local economy than a road to a grazing stand or to a timber stand.

While the monetary value of recreation in the community is important, of great value are the many social benefits gained by recreation activities.

...Such values in terms of greater mental and physical well-being are very real; these may, indeed, be the most important values. 'Man cannot live by bread alone.' He must also live in spirit. Having dominion over most living things, he must himself somehow aspire to higher social development or cease to progress.¹¹

Economic growth in an indirect sense may be stimulated from the experiences associated with recreation. Providing greatly needed recreation facilities for local people will have a beneficial effect on the character of the community and on the people who reside there. Physical exercise, emotional and aesthetic pleasures, social enjoyment, and educational benefit will be derived by those who experience new forms of outdoor recreation within their reach.

10. ORRRC, Report to the President, op. cit., p. 136.

11. Callison, op. cit., p. 113.

CHAPTER III

APPLICATION OF FINDINGS TO DEVELOPMENT POSSIBILITIES

Thus far this study has considered the problem of whether the area has a sufficient quantity of land and adequate resources suitable for recreation to meet the demands for such facilities. It has been established that attendant factors may be used by planners of individual, related recreation units within the planning area.

Water, according to recent studies,¹ is a primary factor in most outdoor recreation activities. It has been established that the area selected as a study model has subsurface water of quantity and quality sufficient for recreation purposes. This water is presently used to irrigate considerable acreage of land in the area, and might be used successfully and beneficially in an expanded manner.

A system of small interconnected artificial lakes might be created. The feasibility of developments of this type could be related to existing small artificial lakes in the form of abandoned sandpits which are scattered throughout the area and might in themselves be developed to provide recreation facilities of a more scattered or less extensive nature. Proposed sites, of either type, may provide one or all of several basic types of recreation: picnicking, day camping, swimming, fishing, and the general enjoyment of the outdoors.

The planning area of dune sand topography is centrally oriented to adequately serve all parts of the study area. The placement of sites within this area will, consequently, provide recreation facilities both for rural people and for the larger population centers, especially Great Bend and Larned which are situated immediately north of the dune sand area.

In addition to serving local needs, new facilities for outdoor recreation in the four-county area may be developed to the extent of serving the entire

1. Primarily the ORRRC studies.

Southcentral Kansas region. This also will be a factor in deciding the demand relative to type, size, and location. The Outdoor Recreation Resources Review Commission found that 53 percent of the people taking vacation trips travel less than 250 miles away from home. Persons traveling on 1-day round trips for outdoor recreation cover about 35 miles each way. Persons spending one night away from home travel about 75 miles each way.²

The cataloging of resource capacities in terms of use is a difficult problem. Various standards (such as the previously cited figure of 45 acres per 1000 population) have been set up to prevent overuse of recreation facilities and to provide optimum conditions for use.³ Similarly, 10 acres per 1000 of the potential population of an area has been considered as a goal.⁴ Such standards are of wide variation and cannot be effectively applied universally without consideration of the area and its particular unique characteristics.

The capacity of a resource to serve recreation needs is a more accurate measure of supply than acreage. For some activities large numbers of acres are essential, but for most it is not the number of acres but how they are used that is important.⁵

Each area within the proposed system may constitute individual problems in planning and development. Certain basic facilities will be required at each site regardless of classification. Others may be of a special type or have special interest and will need special accommodations to emphasize outstanding characteristics.

2. ORRRC, Study Report 20, Participation in Outdoor Recreation, Tables 39, 46.

3. National Conference on State Parks, "Policy and Planning," Guideline, pp. 118-19.

4. Charles Campbell, Purposes and Functions of County-Regional Park Systems, p. 3.

5. ORRRC, Report to the President, op. cit., p. 52.

Since this investigation is predominately limited to analysis and interpretation with no practical planning or design involved, general user-capacity standards cannot be reasonably applied. The study model, however, will provide a basis for additional studies concerning the precise locations and classification of sites within the planning area.

CHAPTER IV

CONCLUSIONS AND RECOMMENDATIONS

The four-county study area has a number of significant historic features which attract national interest and visitors from a wide area. New recreation facilities might, to some extent, serve to provide additional interest for vacation visitors, but the limitations placed on recreation development of the scale intended will probably confine its major use to those residing within a 50 mile radius. This factor, however, should not prevent visitors from greater distances from using a part of these facilities which might be in the form of wayside rest areas, camp sites, and picnic areas.

The predominate forms of outdoor recreation will revolve around the use of water and the creation of new lakes which will bring opportunities for water-based activities to an area that never before had them.

Throughout the area are numerous abandoned sandpits. Some have been developed to provide beach, swimming, and fishing facilities in conjunction with new private developments, while others offer limited, undeveloped, and unsupervised public swimming. Still others stand abandoned and unused either because of the danger anticipated with their use or due to their location and inaccessibility. These water filled depressions offer opportunities to create and develop many small lakes which will add to the beauty of the countryside and provide recreation for the public.

As previously indicated, the impounding of water in the study model area is impractical if not impossible. The overlying soil, among other site factors, is too porous to maintain a sufficient and constant level of water. Dredging, however, to the depth of subsurface water will produce good, clear water suitable for recreation purposes. Previous analysis indicates that water sources are large enough to maintain a year-round water level without more than a foot or two drawdown through evaporation or by transpiration.¹

1. Charles C. Williams and S. W. Lohman, Geology and Ground Water Resources of a Part of South-Central Kansas, p. 133.

"The amount of water lost through evaporation will vary from one season to another, the rate of evaporation being highest in summer when temperatures are highest. In an average year, however, most of the precipitation in the study area comes during (June and July), when the rate of evaporation is greatest."² "The most favorable areas for recharge are those underlain by dune sand,"³ an added confirmation of the suitability of the area in the study model for recreation development.

The dune sand and sandhills, should, to some degree, be preserved and should not be developed to conform with standards of intensive use areas. Planning techniques for outdoor recreation facilities here should stress that these natural qualities are to be used advantageously and their character retained, for outstanding natural features are rather limited in this area. Certain steps will be required to assure the preservation of this quality and to insure its proper use as a development for outdoor recreation activities.

According to the Nature Conservancy,⁴ an organization concerned with the preservation of samples of the wild nature that remain in the United States, the following steps should be taken before developmental procedures begin in natural area preservation.

1. Local name or way of designating the area.
2. General location.
3. Detailed location.
4. Ownership.
5. Tax data.

2. Latta, op. cit., p. 98.

3. *ibid*, p. 99.

4. Richard H. Pough, Data Needed for a Detailed Natural Area Project Analysis, Information Bulletin No. 28.

6. Probable value.
7. Biotic communities.
8. Need for the project.
9. Organization undertaking the project.
10. Probable effort required.
11. Custodianship.

With the adaptation of this land to recreation uses, some thought must be given to the conservation and stabilization of disturbed lands and to the disposition of excavated materials which will be affected in the developmental process. Without sufficient planning for the replacement of adequate cover, considerable wind erosion will occur, eventually rendering the area useless. The importance of this problem is apparent when one considers that water and wind erosion are usually associated with earth moving.

Among the plants which are best adapted to holding soil on sand are the sod-holding grasses such as Calamovilfa and Redfieldia.⁵ However, any perennial grass and many annual grasses play an important part in holding soil or binding sand. These include: Broomcorn (Sorghum vulgare, var. technicum), Sudangrass (S. vulgare, var. sudanese), and Black amber cane (S. vulgare, var. coffrorum). Other native grasses common to the area are: Indiangrass (Sorghum nutans), switchgrass (Panicum virgatum), Canada wildrye (Elymus canadensis), sand bluestem or "turkeyfoot" (Andropogon hallii), big bluestem (A. gerardi), little bluestem (A. scoparius), and side-oats grama (Boutelona curtipendula).⁶

Excavated materials might be readily utilized in the creation of ground forms in harmony with the dune-like relief and also might be used as fill in the construction of new roads.

5. Kansas State Board of Agriculture, Grasses in Kansas, pp. 145-46, 109.

6. U.S.D.A., Yearbook of Agriculture, Soil, 1957, pp. 322, 324.

Care in planning for the preservation and protection of other remnants of native landscape which are not developed with facilities for intensive use may be implemented through scenic easements, a form of zoning, which protects the natural character of the roadside.⁷

The designation of pleasure drives or a parkway system paralleling the Arkansas River might be advantageous both in that it would provide access and connecting links between recreation sites and would also serve as a means for the preservation of the flood-plain area along the river with the use of a scenic easement. Planning of this type can produce conservation values as well as provide recreation values for pleasure driving.

Presently, much attention is being given to the proposal for a Great Prairie Parkway that would run some 200 miles the width of the state.⁸ An Arkansas River Parkway or a Santa Fe Trail Parkway might easily be incorporated into this proposal or become a spur of the main system. The convenience, comfort and enjoyment of both out-of-state tourists and of residents could be increased by these measures.

In addition, overnight camping facilities and rest areas can easily be included in the planning of sites on or near such major arteries of travel. A carefully planned recreation program integrated with the highway system, in which the needs and activities of both are balanced, is indicated.

Additional planning for other types of recreation activities in the area are possible and are recommended in facilitating a properly balanced program. There is room for expansion in providing more golf courses, hunting preserves and shooting ranges, camping areas, roadside rest areas, waysides, and perhaps even trailer parks for overnight or weekend use. Many of these recreation types

7. Marsh, op. cit., p. 265.

8. Manhattan Mercury, June 24, 1964, p. 14.

do not require areas possessing unique natural qualities and may be adequately served by the utilization of idle and unproductive lands.

With long-range planning, adjustments can be made and anticipated to provide both quality and quantity in needed outdoor recreation provisions for the growing number of recreating Kansans.

FURTHER STUDIES NEEDED

Relative to the planning of individual units in the four-county area, research in other facets of outdoor recreation will provide additional information for evaluation in specific proposals. Among the kinds of studies needed are:

1. Studies of economic organization of various kinds of recreation including capital requirements, equipment and layout of projects, and operating procedures. The community and its role in recreation development could serve as a base for this study.

2. Studies of laws and ordinances pertaining to zoning and the laws governing use of water for recreation. The use of water in downstream areas is an example.

3. Research in psychology, especially in human motivation, is needed in undertaking recreation developments. The factors of increased mobility might, for example, be related to a study of this type.

4. Studies to evaluate the alternative kinds of recreation facilities which might be provided as new areas or new physical resources become available. The development of new interstate roads and parkways is an example.

ACKNOWLEDGEMENT

The author wishes to thank Professor Herrick H. Smith for his invaluable guidance and constructive criticism in producing this thesis. Appreciation is also expressed to Dr. O. W. Bidwell for his cooperation in making available soil and geological survey information and references.

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APPENDIX

Class I is

photographs of Oct. 1938. (Symbol CH6)

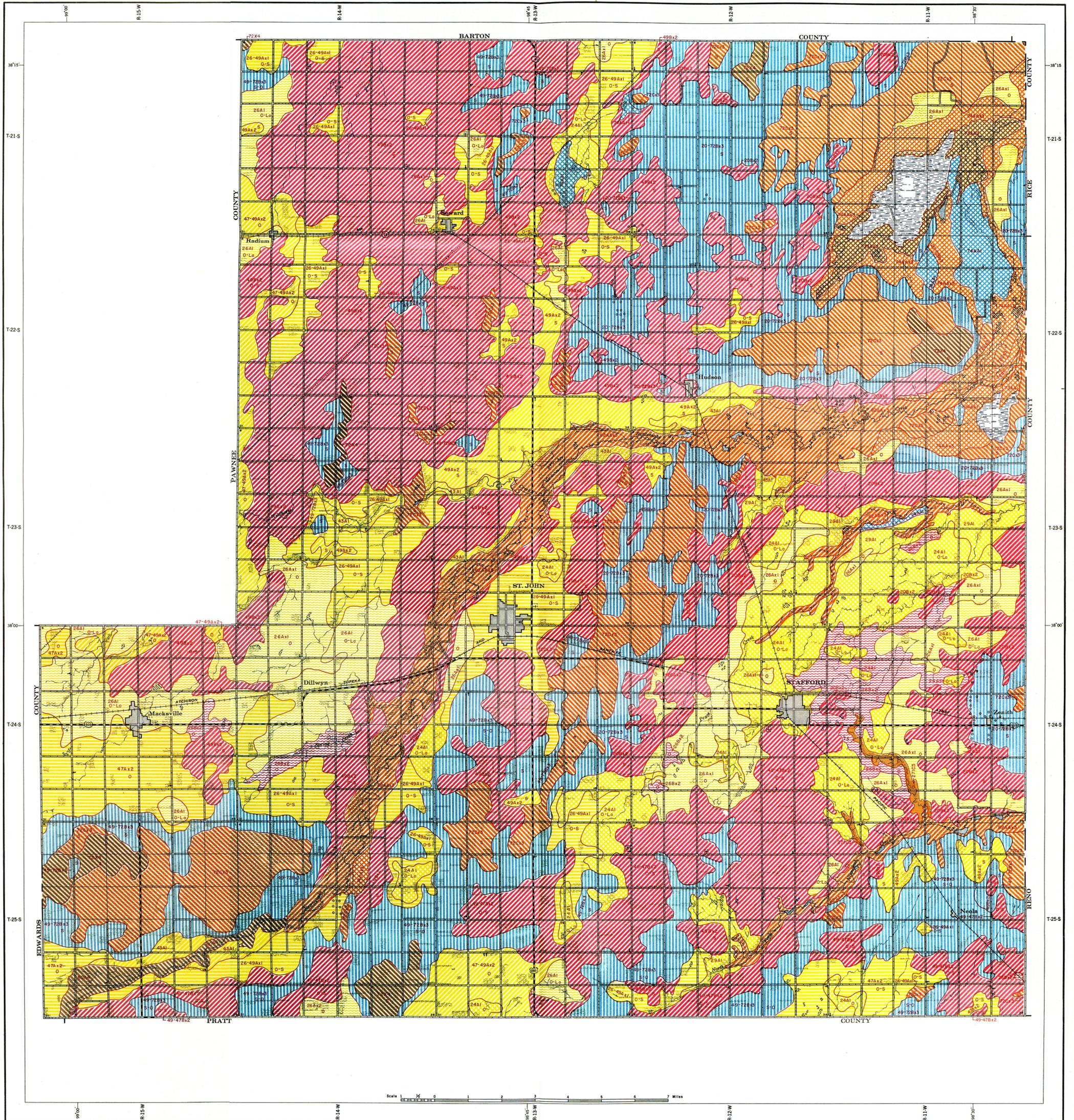
PHYSICAL FACTORS TO USE CAPABILITY OF THE LAND IN BARTON COUNTY, KANSAS

Symbol	SLOPE - Percent Range	LAND-CAPABILITY CLASSES BASED ON SOIL, SLOPE, EROSION AND CLIMATE							
		Erosion Symbol - 1 Erosion Type	Land Class	Erosion Symbol - 2 Erosion Type	Land Class	Erosion Symbol - 3 Erosion Type	Land Class	Erosion Symbol - 4 Erosion Type	Land Class
Ax A Bx	irregular, low hummocky	wind	II	wind, sheet	III	wind	IV		
Bx	low hummocky			wind	III	wind	IV		
A B	0 - 2 2 - 5	sheet	II	wind, sheet	III				
B C	2 - 5 5 - 10			sheet, gully sheet, gully	III IV				
Ax A B	irregular 0 - 2 2 - 5	wind sheet sheet	II II III	sheet, gully sheet, gully	III III				
B C	2 - 7 7 - 12			sheet, gully sheet, gully	III IV	VI			
A	0 - 2	sheet	II						
A	0 - 2	sheet	I	sheet, wind	II				
C	7 - 12					gully, sheet	VI		

BARTON COUNTY
LAND CAPABILITY

STAFFORD COUNTY KANSAS

RECONNAISSANCE SOIL CONSERVATION SURVEY
 SHOWING GENERALIZED CLASSES OF LAND ACCORDING TO USE CAPABILITY



CLASSES OF LAND ACCORDING TO USE CAPABILITY

Colors indicate classes of land according to capability for safe and continued use, based upon the physical factors mapped and the existing environment.
 See back of map for: (1) Explanation of survey legend, (2) Table showing relations of physical factors and land capability classes, and (3) Legend of geographic symbols.

SUITABLE FOR CULTIVATION WITH

II Simple practices

- Dark, tight clay and semi-claypan soils
- Moderately heavy, clayey soils
- Moderately sandy soils
- Sandy soils

III Intensive practices

- Moderately heavy, clayey soils
- Sandy soils

IV Limited use and intensive practices

- Dark, tight clay and semi-claypan soils
- Loamy sand soils

NOT SUITABLE FOR CULTIVATION:

SUITABLE FOR GRAZING OR WOODLAND WITH

- Moderate restrictions in use
- Shallow silty to clayey soils
- Dark, tight clay and semi-claypan soils
- Sandy soils
- Loose sands and sandhills

VII Severe restrictions in use

- Dark, tight clay and semi-claypan soils
- Loose sands and sandhills

Base map compiled by the Soil Conservation Service from Kansas county and transportation maps with drainage delineated from aerial photographs. Physical Survey by the Soil Conservation Service in cooperation with the Kansas State Agricultural Experiment Station. Polyconic projection, North America, 1927, Datum indicated by marginal ticks. Sixth Principal Meridian. Horizontal control by G. L. O. Reproduced by the Soil Conservation Service. Field Survey completed December 1940.



A LANDSCAPE INTERPRETATION OF A REGION OF KANSAS TO DETERMINE
ITS SUITABILITY FOR RECREATIONAL DEVELOPMENT

by

RALPH WILLIAM SHERMAN

B. S., Kansas State University, 1963

AN ABSTRACT OF
A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

College of Architecture and Design

Landscape Architecture

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1964

The purpose of the study underlying this thesis has been to determine, through a logical interpretation of resources and related socio-economic influences, the outdoor recreation needs and demands of the people of the Rice-Barton-Stafford-Pawnee County area of Kansas. Through these procedures, the determination of the recreation resources available in the area has been made and analyzed with consideration given to their ability to satisfy those needs and demands both now and in the future.

Through interpretation of the physical characteristics of the planning area and its relationship to the four-county study area within the designated Southcentral Kansas Region, the selection of a study model has resulted. This study model consists of the dune sand topography found in the area south of the Arkansas River where subsurface water is available in large quantity and at shallow depths. Generally, this land is unproductive to agricultural use and has been found to possess adequate resources to facilitate the creation of small water-based recreation areas.

Predominate use of these recreation facilities is intended for those residing within a 50 mile radius, but use by others should be encouraged. The recreational use of these newly developed areas will necessitate careful conservation measures to assure the preservation of the natural qualities of the dune sand topography.

Additional convenience and accessibility to sites within the area may be made possible with the inclusion of an integrated parkway system which would furnish new areas for recreation development.

Consideration of the quantity of recreation requirements will entail additional study and will come with the planning of individual and related units in the system. The study model, by its intent, will serve as a base for such studies.

The preparation of this thesis has been executed with the hope that these principles might be successfully facilitated with the aid and application of the analyses provided by the study model.