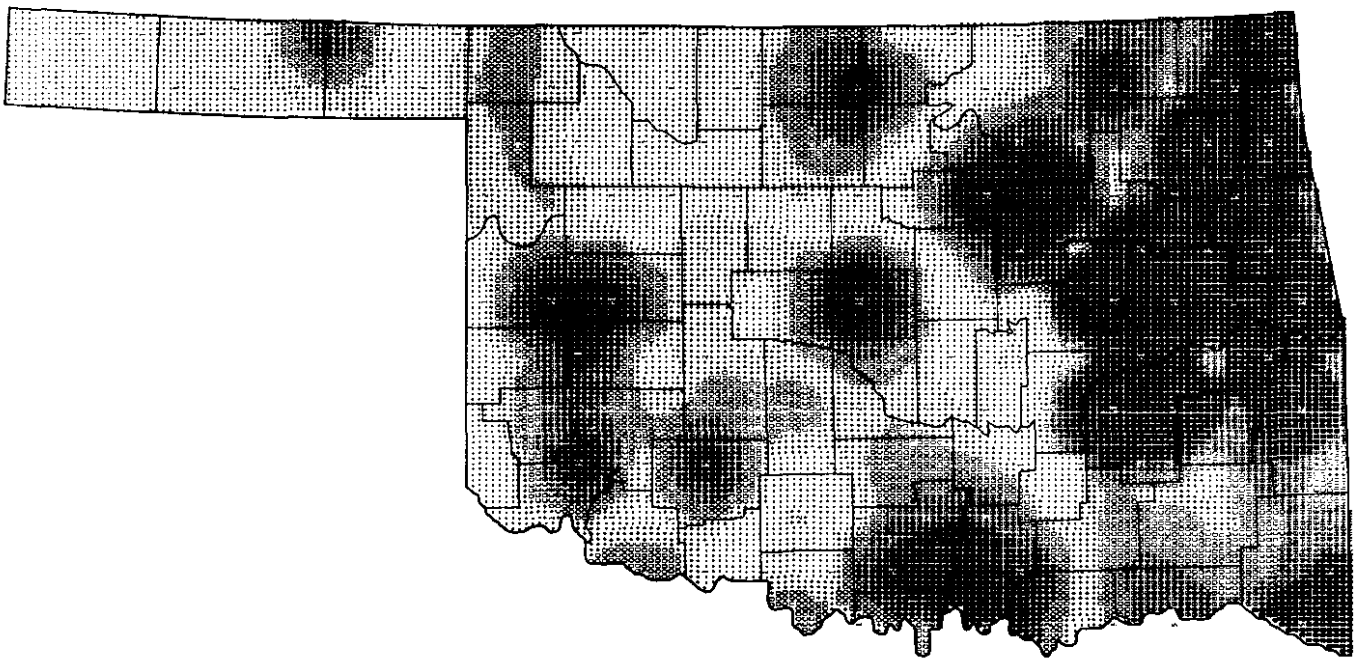
WATER - ORIENTED
REGIONAL RECREATION OPPORTUNITIES
FOR
OKLAHOMANS



RICHARD D. HECOCK

AND

JOHN F. ROONEY JR.

DEPARTMENT OF GEOGRAPHY

OKLAHOMA STATE UNIVERSITY

THE OKLAHOMA WATER RESOURCES RESEARCH INSTITUTE

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WATER-ORIENTED REGIONAL RECREATION OPPORTUNITIES FOR OKLAHOMANS

Submitted to

The Oklahoma Water Resources Research Institute
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Prepared by

Richard D. Hecock
and
John F. Rooney, Jr.
Department of Geography
Oklahoma State University

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ACKNOWLEDGEMENTS

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CHAPTER I

INTRODUCTION

Projections concerning the utilization of water resources seem to consistently under estimate the quest of state residents for water oriented recreation. The 1960 estimates for the 1980-2000 period were exceeded in 1970! In Oklahoma demand has outstripped the supply of outdoor recreation facilities many times during 1973 (Appendix B), and there is some evidence that recreational resources themselves have deteriorated due to overuse. There are many who believe that the quality of the recreation experience has declined as a result of increasing crowdedness. Furthermore it is generally conceded that the future will witness even greater levels of demand for outdoor recreation requiring a massive expansion of present facilities and the addition of many new ones to the states outdoor recreational resource base.

On the other hand, many facilities appear to be underused. In order to assure that such expansion in the resource base will progress in a logical, efficient, and equitable way planners need to carefully evaluate current planning procedures and must be prepared to make adjustments in these procedures. For it appears likely that past planning errors have resulted in some or all of the present problems.

Present Procedures: Some Weaknesses

Planners are not decision-makers. Indeed, the modus operendi of the planning profession is in large part dictated by existing legislation[1]

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[1] For example, Land and Water Conservation Fund Act, and the Federal Water Project Recreation Act.

and the reigning administrative interpretation of that legislation.[2] It is also influenced, admittedly to a lesser extent, by committee custom.[3] Final decisions are often governed by political considerations bearing little relationship to the wisdom imparted by the planning process.[4] Hence planners are at the mercy of a variety of forces, pursuing a variety of goals, which in many cases override or circumvent the logical course.

Regional recreational planners currently rely heavily upon two general types of strategies - the regional evaluation approach, and the project evaluation approach. The former is closely associated with the Statewide Comprehensive Outdoor Recreation Plans (SCORPS), prepared by the States in order to qualify for Land and Water Conservation Fund Act grants. Using this regional strategy, the planner identifies an area, frequently a county or county group, makes an inventory of recreational supplies, infers present and future demand from recent local or nationwide participation rates, and compares demand with supplies. The final step involves a prescription for additional facilities.

The project evaluation approach is most closely identified with Federally-sponsored projects in which recreation is the purpose, or one of a variety of purposes. The Corps of Engineers, the Soil Conservation

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[2] See for example Federal Register, Vol. 38, #174, Pt. III (Sept. 10, 1973), "Water and Related Land Resources Establishment of Principles and Standards for Planning." (Water Resources Council)

[3] There are entirely different procedures followed by those agencies which liason with the Senate Committee on Public Works and those which work with Senate Committee on Interior and Insular Affairs.

[4] R.A. Cooley and G. Wandesforde-Smith, eds., Congress and the Environment, University of Washington Press, (Seattle: 1970).

Service, and the Bureau of Outdoor Recreation are agencies which are identified with this type of evaluation. The usual procedure goes something like this. First there is an assessment of demand for recreation facilities of the type provided by the proposed project. This is accomplished by identifying participation levels of people living within 50 or 75 miles of the proposed project. Next existing regional facilities and their capacities are inventoried. Finally the extent to which current facilities are able to meet present and future demands is assessed, and the proposed facility is evaluated in terms of its ability to fulfill any leftover demand.

We believe that these kinds of general approaches suffer some conceptual and procedural shortcomings, and that these shortcomings may be responsible for some of the obvious misallocations of resources which have occurred. Most blatant are the underuse and overuse, to which we have already referred.

Emphasis on Participation as a Surrogate of Demand

It has been customary in both of the general approaches described above to treat current or recent participation rates as surrogates for demand. To a large degree this practice has resulted from a paucity of data, rather than ignorance of the problem. Nonetheless, the fact that participation and participation levels are linked to the availability of facilities is extremely well documented,[5] and seems to extend to the

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[5]For a discussion of these relationships, see: J. Knetsch, "Assessing the Demand for Outdoor Recreation," Journal of Leisure Research, Vol. 1, (1969) 85-87; J.J. Seneca and C.J. Cicchetti, "User Response in Outdoor Recreation: A Production Analysis," Journal of Leisure Research, Vol. 1, (1969) 239-245; J.J. Seneca, "Water Recreation, Demand and Supply," Water Resources Research, Vol. 5, (1969) 1179-1185; E.L. Shafer, "Visitation Prediction," in Recreation Symposium Proceedings, (Upper Darby, PA.: Northeastern Forest Experiment Station, 1971), 211.

Oklahoma situation (See Appendix C). Therefore, estimating demand for new facilities, based upon participation rates seems at best, to preserve present patterns of participation. At worst, it serves to preserve the current inequitably distributed supplies relative to the locations of existing or future populations.

Arbitrary Planning Regions

The preparation of the SCORPS relies heavily on the "Planning Regions" approach. Often these planning regions bear little resemblance to functional regions. Generally these planning regions are defined by political or administrative boundaries, often a county or county multiples, and have little functional relevance for recreational planning. Thus such regionalizations often result in large planning units and averaging conditions of supply and demand over such a large area obscures the realities of the internal distributions of population and facilities. Moreover, the people within a planning region are likely to rely heavily upon recreation areas outside the boundaries of their region, while their own recreation areas may serve many people from other areas. A related problem stems from the general practice of extending the evaluation of demand and supply only to state boundaries, even in cases where it is clear that recreational areas in adjacent states represent important recreational resources. Similarly populations in bordering communities may compete with in-state populations for their recreational resources. (Appendix D provides a fuller discussion of the foregoing problems).

It seems likely that accurate evaluation of recreational needs requires an approach which provides a geographic sensitivity which is considerably greater than that which currently exists.

Emphasis in Site Evaluation

A final criticism centers specifically in the project evaluation approach. Frequently in the case of Federal projects, and to a lesser extent, state and local ventures, recreation is but one of several project purposes. Some of the other purposes may have relatively specific locational requirements, so that relatively few alternatives in scale or location can be realistically investigated. The tendency characterizing this approach is to ignore the broader and more fundamental questions concerning the recreational needs of an area. Thus while the project may be feasible and useful in its own right, and may add significantly to the recreational resources of the area, it may not be the most needed of all possible projects.[6] It seems highly desirable that all proposed projects be continuely subjected to analysis whereby this impact can be assessed in context of all existing and contemplated projects as well as in light of their contribution to specified goals of improvement in recreational resources.

We believe that both the regional and the project evaluation approaches can be better served by employment of an evaluation scheme which allows...

- that all people should be treated equally in the evaluation of the adequacy of present facilities, and not discriminated against or favored, on the basis of their past or present recreational participation behavior;
- that recreational resources supply situations can be evaluated without regard for arbitrary State of sub-state;

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[6] R.J. Kalter and L.E. Gosse, "Recreation Demand Functions and the Identification Problem," Journal of Leisure Research, Vol. 2 (1970), 24-30.

- that any proposed project or combination of projects can be readily evaluated as to the extent to which improvements in the regional recreation opportunities will occur;
- that priorities can be readily identified on the basis of the inequities on the present system.

It is believed that the approach described in this report contains these features.

Water-Oriented Recreational Opportunities in Oklahoma

Specifically this report will...

- identify present patterns of water-oriented recreation resources in Oklahoma (Chapter 2);
- evaluate these resources insofar as they represent opportunities for the people of Oklahoma (Chapter 2);
- identify the extent to which planned increments to the nearby water recreation resource base will alter recreational opportunities for Oklahomans (Chapter 3).

In addition the report inclues appendices which focus upon...

- methodology for assessing opportunities (Appendix A)
- overuse or full-capacity use of recreational opportunities in Oklahoma (Appendix B);
- the relationship between demand (participation) and opportunities in Oklahoma (Appendix C);
- the adequacy of Substate Planning districts for recreation planning in Oklahoma (Appendix D).

CHAPTER II

RECREATIONAL OPPORTUNITIES FOR OKLAHOMANS

Oklahoma's Regional Recreation Resources

Oklahoma is reasonably endowed with recreational resources. Among the States, Oklahoma ranks 30th in total public recreation land area, and 23rd on a percapita basis. In terms of water acreage (lakes, reservoirs, of 40 acres or more), however, the State ranks 11th in total acreage and 17th on a per capita basis.

Oklahoma's recreational resources are located predominantly in the eastern one-third of the State (figures 1 and 2). This to a large degree is related to the rather more favorable climatic and topographical conditions for impounding water which prevail in that area. Land devoted to recreational purposes is mostly associated with water in some form, hence the fairly close correspondence between the patterns of the two maps.

As with the case in many States, the pattern of recreational resources availability bears little relationship to population distribution. Thus most recreation areas are not within the Tulsa-OKC-Lawton axis which contains nearly 60 percent of the State's residents (Figures 3 and 4).

Measuring Recreational Opportunities

In this study recreational opportunities are defined in terms of the recreationist's or potential recreationist's location relative to recreation resources. While recreational resources may be described and classified in terms of their type, capacity, or quality, recreational opportunities are described and classified in terms of their type, capacity, and quality, relative to their proximity to the recreationist or potential recreationists. Thus while recreational resources are measured at the

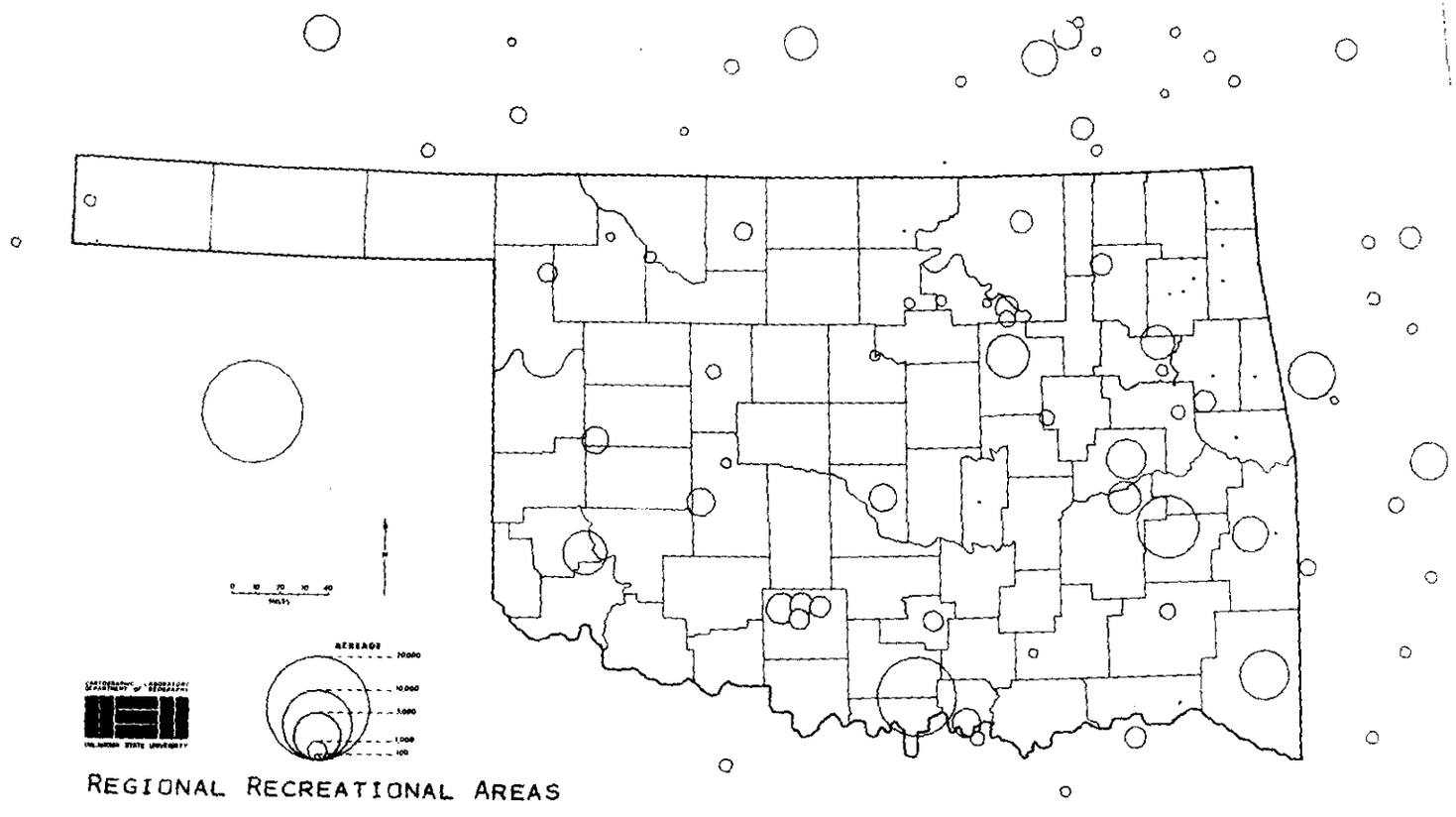

Figure 1

Regional Recreation Areas

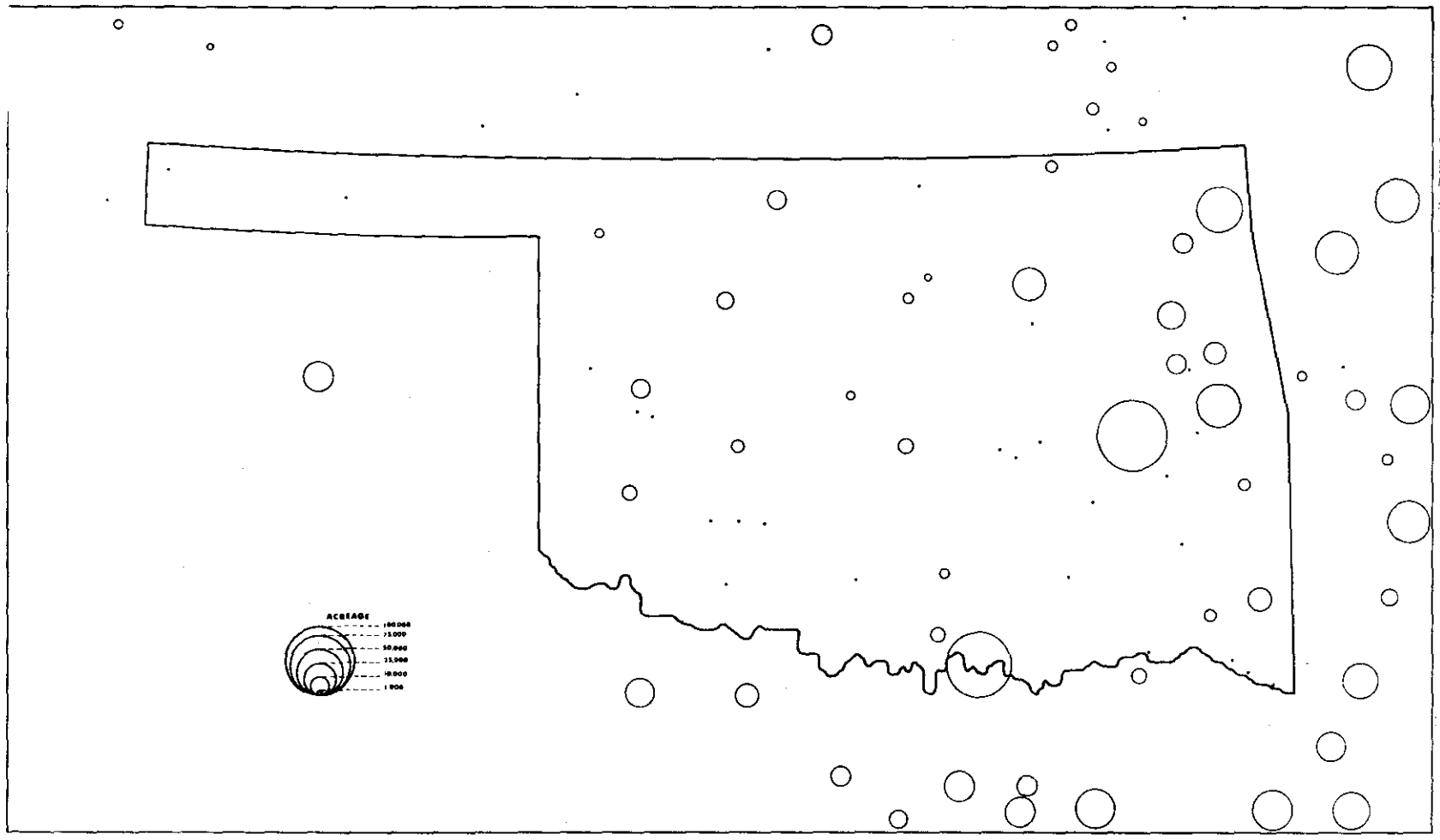

Figure 2

Recreation Lakes

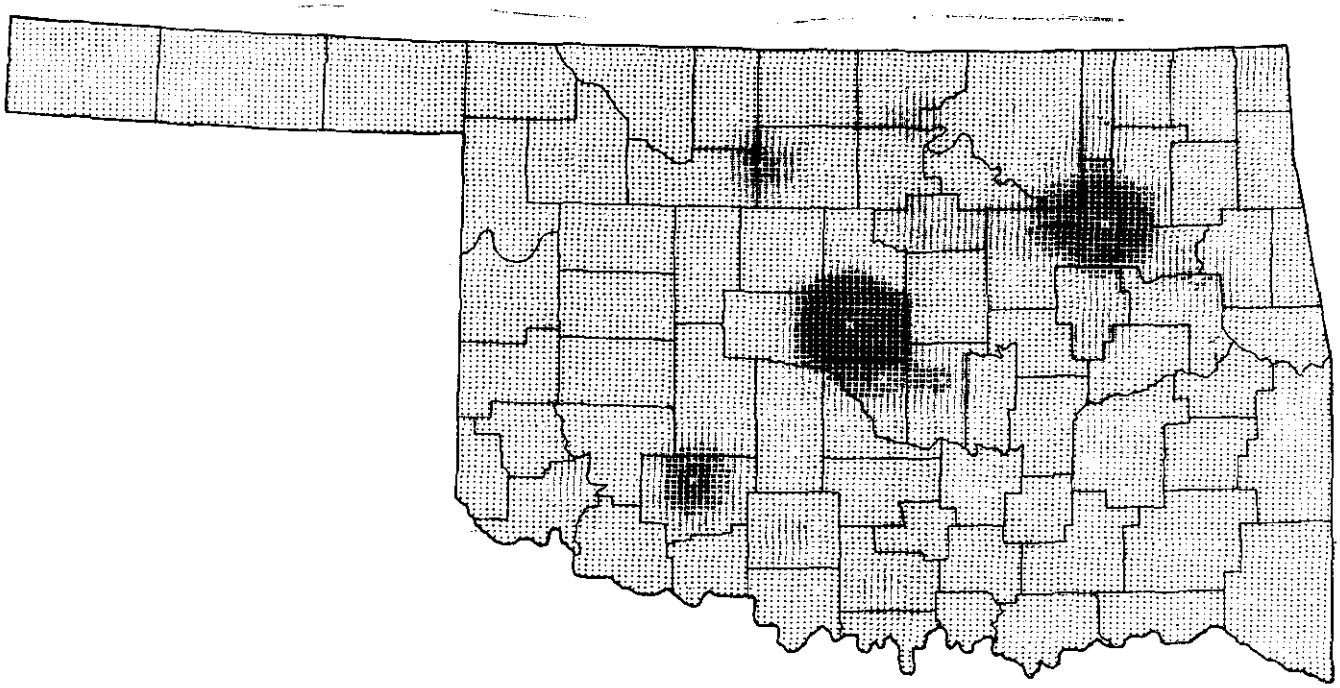

Figure 3

Population Distribution

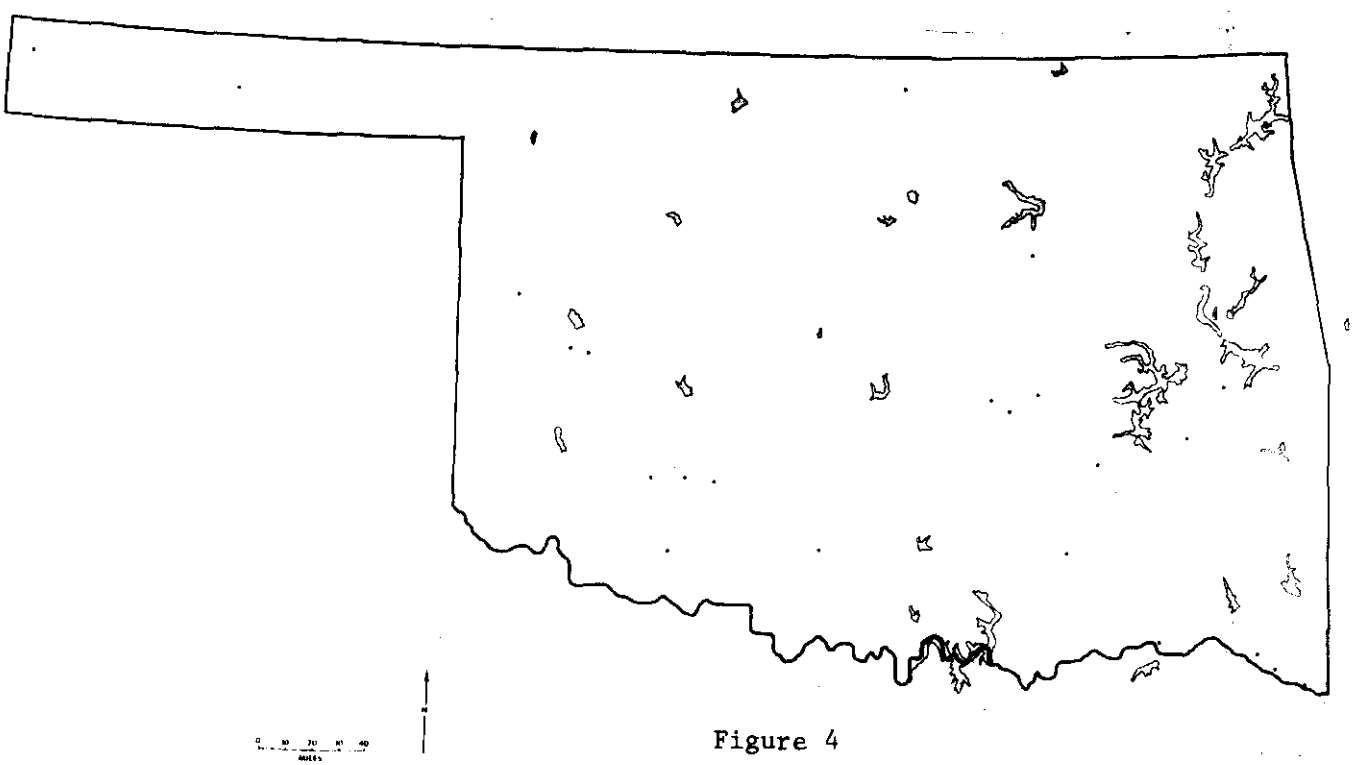

Figure 4

Reservoirs in Oklahoma

facility, opportunities are measured at the locations of recreationists or potential recreationists (Table 1).

Just as many possible criteria of facilities can be measured, so too can many criteria of opportunities be identified and measured. In succeeding sections of this chpater, consideration is given to three general types of criteria for measuring recreational opportunities. The first is related to the minimal distances between people and certain kinds of facilities. We include it on the premise that one objective of recreation planners should be to identify and reduce the inequities in the amount of time different groups of people must travel to reach at least some recreational facility. The second type measures the number and extent of opportunities within arbitrarily selected distance zones (driving ranges). We include it in order to show the discrepancies in quantity and variety of opportunities available in different regions of the State. This approach also facilitiates comparison with some existing (though admittedly crude) recreational planning standards. The third measure allows for assessment of the extent to which an individual or community must compete with others for recreational opportunities. This last measure attempts to focus upon the need for providing more facilities in areas where populations are greater.

Mapping Recreational Opportunities

In preparation for the mapping of recreational opportunities, 1970 population figures were obtained for approximately 1000 Census County Divisions within Oklahoma and in areas within 150 miles of Oklahoma's boundaries.[1] Population was allocated to a set of points superimposed

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[1]U.S. Bureau of Census, 1970 Census of Population, Number of Inhabitants, Final Report PC(1)-A, U.S. Govt. Printing Office, Wash., D.C., 1971.

TABLE 1. RECREATIONAL FACILITIES VERSUS RECREATIONAL OPPORTUNITIES

	RECREATIONAL RESOURCES	RECREATIONAL OPPORTUNITIES
What is Measured?	Size, capacity, type, quality	Proximity to recreation facilities of given size, capacity, type, quality
Where Measured?	At location of facilities	At location of recreationists or potential recreationists
Examples:	Number of swimming areas Acres of recreation land	Number of swimming areas within 25 miles Distance to nearest boating facility Water surface acres per person within 50 miles

on a map of the region. The population points were equally spaced at eighteen mile intervals.

One objective of this procedure was to obtain a level of geographic sensitivity greater than that provided by use of county population data and county centroids.[2] The procedure also reduced the effect of arbitrarily defined administrative boundaries (County and State) on the subsequent measurement of opportunities and had the added attraction of overcoming the visual and computational distortions caused by having counties or census county divisions of markedly different sizes and shapes.

Measurements of recreational opportunities were made at each of these approximately 300 points and the values obtained served as inputs to the computer analysis and mapping routines.[3] Note that while measurement and assessment of opportunities were made for the whole region, irrespective of State boundaries, the maps generated display only the values for the 180 Oklahoma population centers.

Distance to nearest Facility

This type of opportunity measure simply portrays the minimal conditions of access to recreational facilities for each person in Oklahoma.[4]

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[2]Use of County data would have provided 77 population centers for Oklahoma; the procedure described here produced 180 population centers.

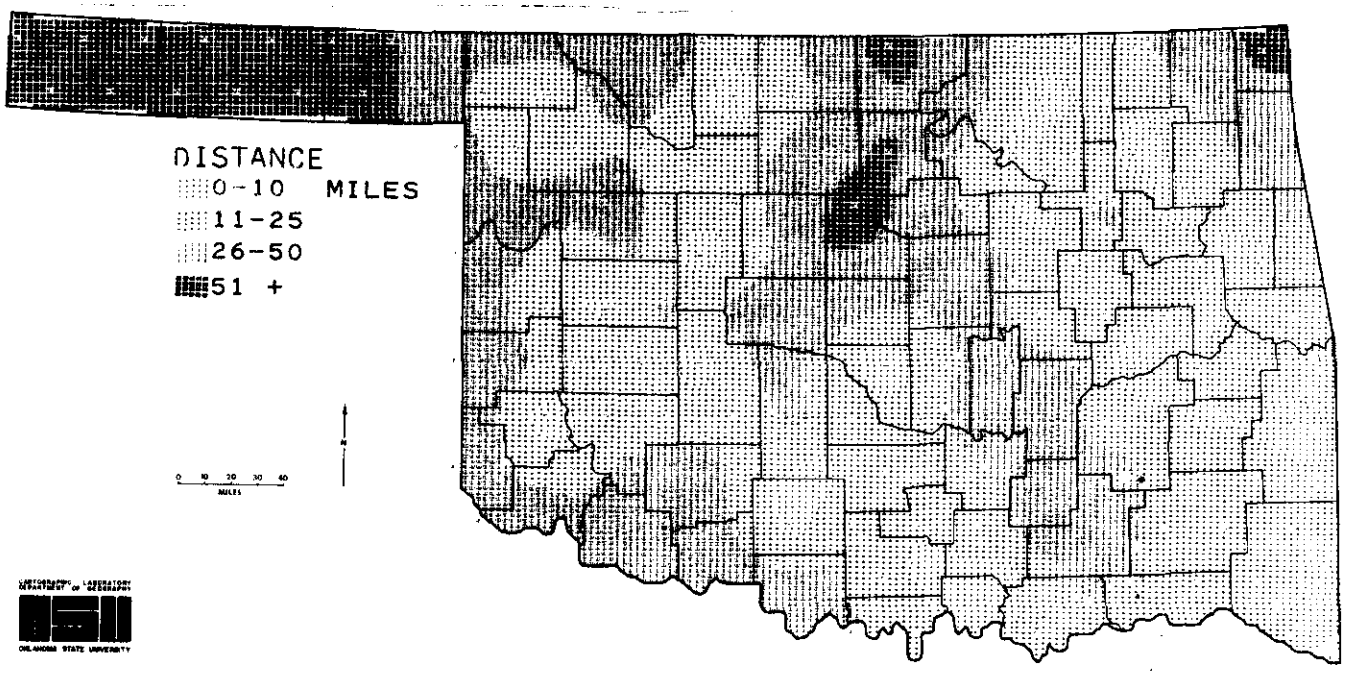
[3]SYMAP, version IV was used to generate the maps.

[4]Data on recreational facilities in Oklahoma utilized in this study were obtained from detailed tables contained in the Appendix to the Oklahoma Statewide Comprehensive Outdoor Recreation Plan (SCORP), Tables 54, 55, 56, Second Edition, 1972. Data on recreational facilities outside of the State were obtained from the respective State Recreational Planning agencies, from the Corps of Engineers, and from the Bureau of Reclamation.

It is clear that distances[5] which must be traveled by Oklahomans in order for them to reach the water-oriented regional recreation area[6] nearest to them varies greatly from place to place (Figure 5). For example

Figure 5

Distance to Nearest Water-Oriented Recreation Facility of 500 Acres



people living in the Northwest and in some small sections of the North Central parts of the State are very poorly served in this regard. A similar proximity problem exists with regard to major reservoirs and lakes (Figures 6 & 7). It is important to note that these measurements are made to the access point of the facility nearest to the population point, whether the facility happens to be in Oklahoma or not.

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[5]Distances were measured in "Airline" miles to the nearest park entrance to an access point on the lake or reservoir.

[6]A regional recreation area provides opportunities for a variety of recreational pursuits and usually has a land area in excess of 100 acres. A water-oriented facility has facilities for swimming, boating, or fishing.

Figure 6

Distance to Nearest Recreation Lake of at Least
1000 Acres Surface Area.

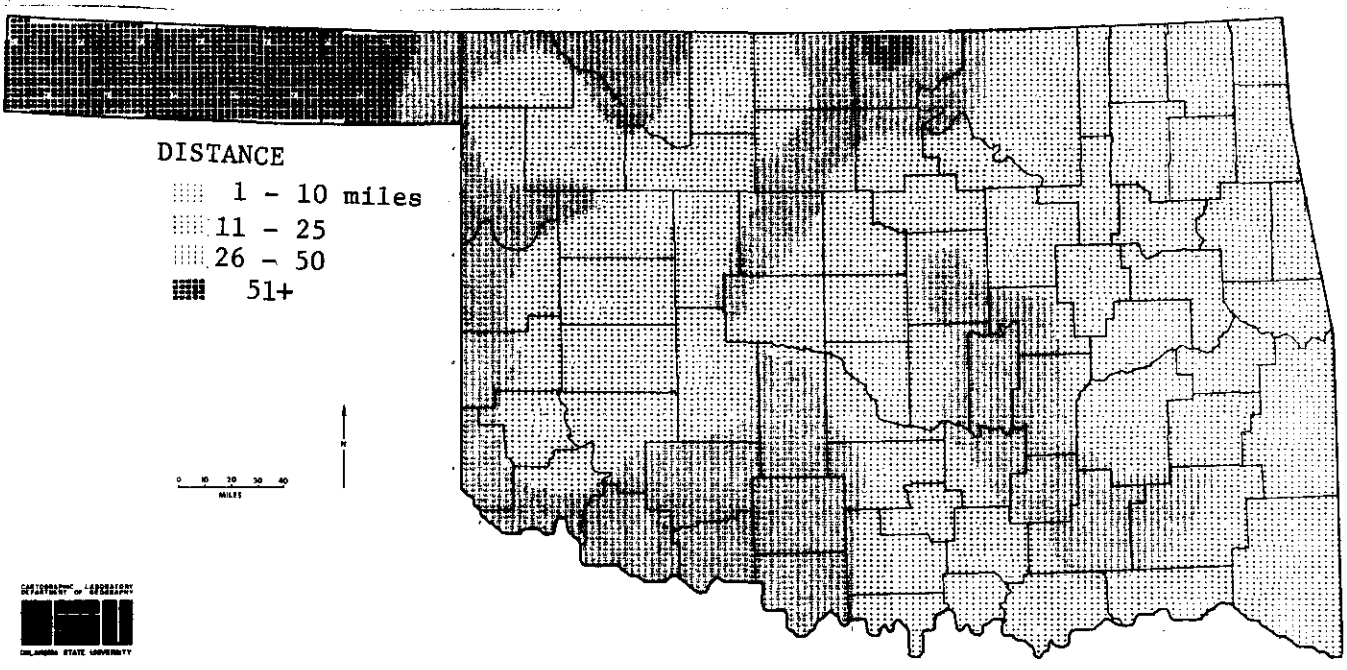
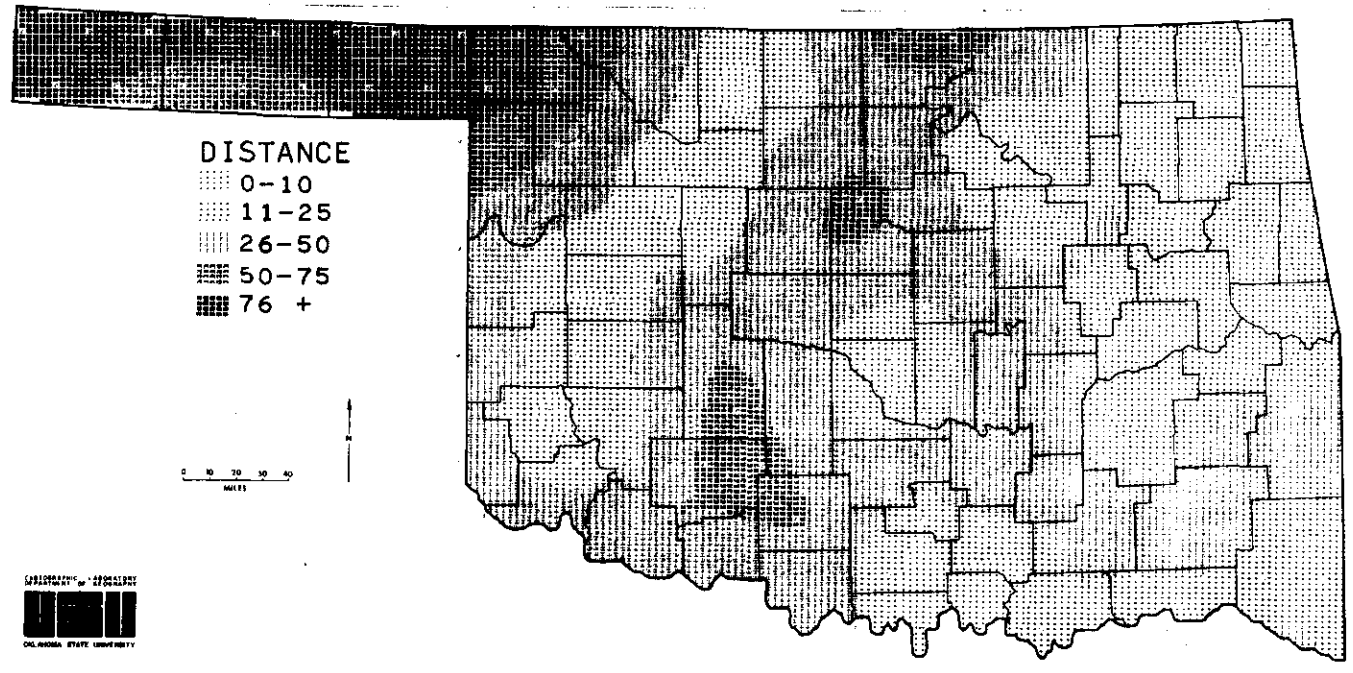


Figure 7

Distance to Nearest Recreational Lake of at Least
5000 Acres Surface Area



It is also instructive to observe that not only are people in many parts of Oklahoma rather poorly served by such facilities (and other types of recreation facilities for that matter), but a fairly large portion of the population does not enjoy easy access to such failities (Table 2).

TABLE 2. OPPORTUNITIES FOR OKLAHOMANS:

DISTANCE TO THE NEAREST FACILITY

The Proportion of the Population which is ...

From ...	0 - 10	11 - 25	26 - 50	50 or more miles
Regional Recreation Facility	15.3%	33.3%	50.1%	1.3%
Regional water-oriented recreational Facility Park	12.7%	30.0%	54.6%	2.7%
A Reservoir of 5000 acres or more	18.0%	20.0%	53.9%	7.9%
A Reservoir of 1000 acres or more	21.3%	46.8%	30.6%	1.2%

More than half of all Oklahomans must travel over twenty-five miles in order to reach a regional park or a regional water-oriented park. In this connection it is of interest that most established distance standards call for the location of such a facility within a half-hour drive of population centers.[7] Most locations in Oklahoma (containing about half the Oklahomans) fail to meet that standard.

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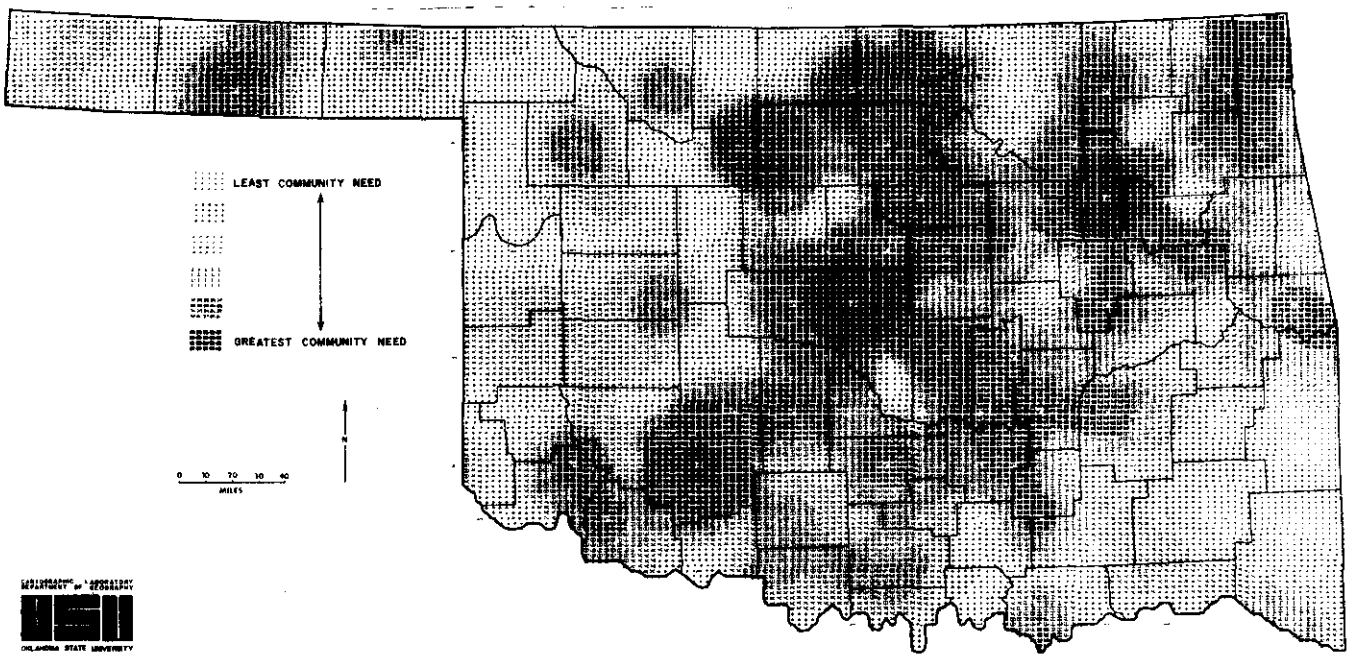
[7] U.S. Bureau of Outdoor Recreation, Outdoor Recreation Space Standards, U.S. Government Printing Office, Washington, D.C., 1971.

In order to highlight those densely populated locations characterized by great distance from the nearest facilities, each place's distance to the nearest regional recreation areas was multiplied by its population (Figure 8). When this is done a significantly different pattern emerges, one in which the most serious deficits in opportunity are in the urban areas.

Figure 8

The Product of Population Times the Distance to Nearest Regional Recreation Area



The Driving Range: Numbers and Extent of Opportunities

A second criterion of opportunity measures the availability of facilities within a specified distance or driving range. How many different recreation areas are there within an appropriate driving range? What type of facilities are there? How extensive are the facilities within this distance.?

It is common to attempt to provide regional recreation facilities

within a half-hour driving time of population centers.[8] In accord with that convention, the following discussion focuses upon some characteristics of recreational facilities within twenty-five miles of Oklahomans.

One cannot reach a regional water-oriented recreation facility from most sections of Oklahoma by merely driving twenty-five miles (Figure 9), or any other type of regional recreation facility for that matter (Figure 10). The situation is particularly serious in the heavily-populated North-Central part of the State, but is also characteristic of most of the Panhandle and the Southwestern areas. Moreover, even the eastern sections of the State are not especially well-served. Inhabitants of that area generally do not have many choices of recreational facilities.

More than one-third of the state's population has no water-oriented regional recreation facility within twenty-five miles. An even greater percentage have only a limited choice (Table 3).

TABLE 3. OPPORTUNITIES FOR OKLAHOMANS: PROPORTION HAVING VARIOUS NUMBERS OF FACILITIES WITHIN 25 MILES

	PROPORTION OF OKLAHOMANS HAVING ...					
	no	1	2	3 - 5	6 - 10	11 or more
Water-Oriented Regional Recreation Areas within 25 miles.	34.1%	36.4%	12.7%	12.2%	4.7%	0
Recreational lakes with more than 1000 surface acres within 25 miles	18.3%	45.5%	29.0%	7.2%	0	0

Similar observations can be made regarding the opportunities for any type of regional recreational resource and it seems fair to conclude that an

[8] Op. Cit., Bureau of Outdoor Recreation, 1967.

Figure 9

Number of 1000 Acre or Larger Recreation Lakes
Within 25 miles

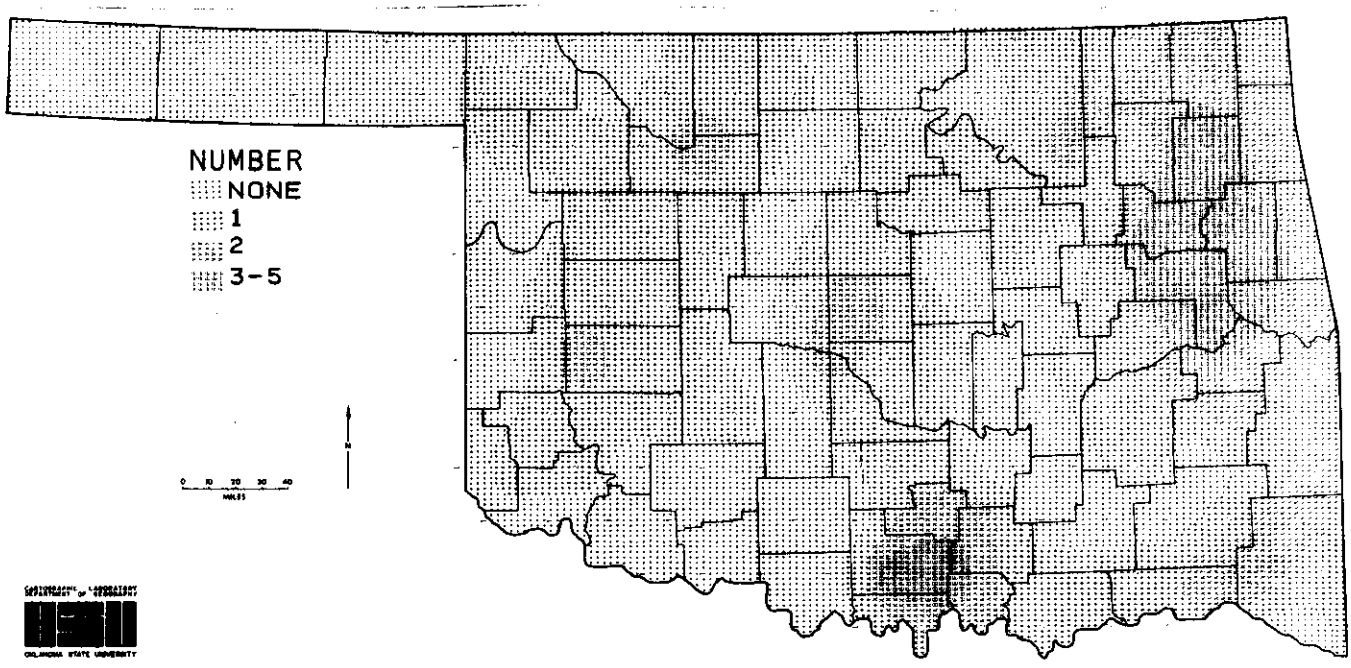
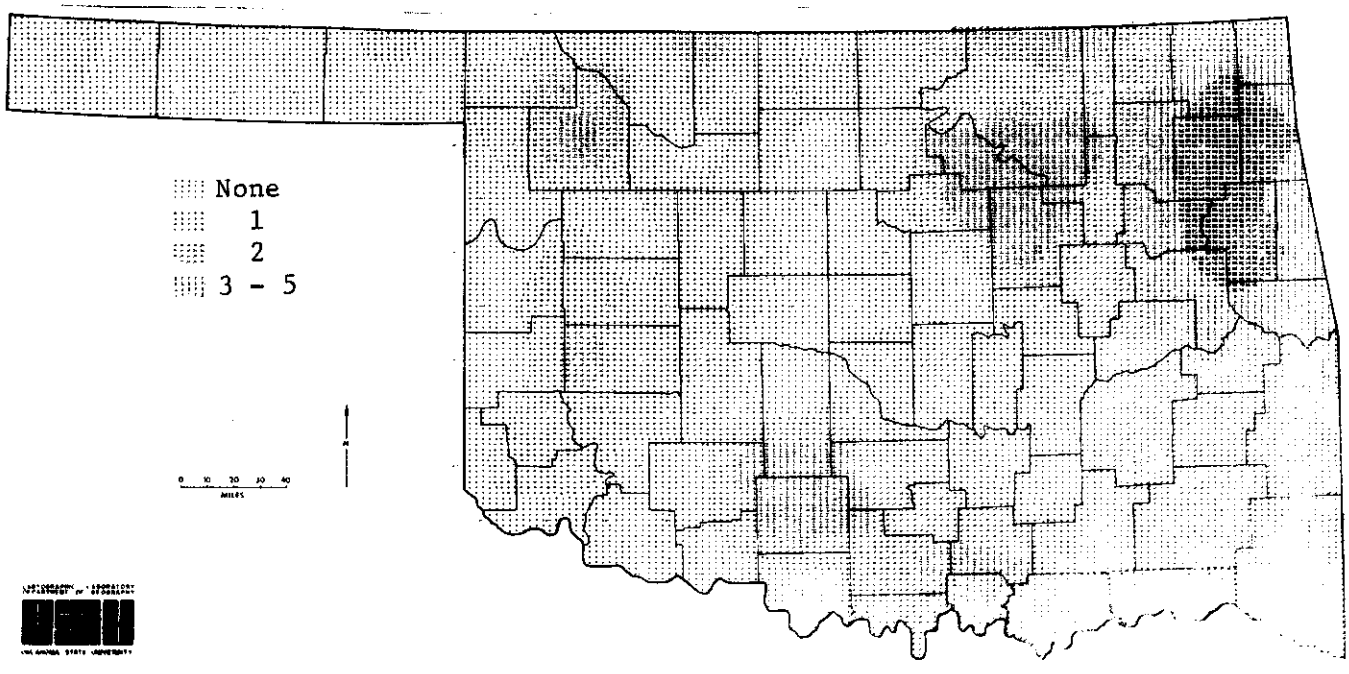


Figure 10

Regional Recreation Areas Within 25 Miles



excessively large proportion of Oklahomans do not possess recreational opportunities consistent with accepted standards.

Whereas the number of facilities within a specified distance zone provides an indication of the range of choices available to a person at a given location, the acreage available within that same distance zone provides a measure of the extent of the facility. Consistent with the preceding findings, there is relatively little acreage available for large parts of the State, and the North-Central, Northwest, and Southwest sections exhibit the greatest deficiencies (Figures 11, 12). Once again a large percentage of Oklahomans have little or no recreation acreage immediately accessible to them (Table 4).

TABLE 4. OPPORTUNITIES FOR OKLAHOMANS: PROPORTION HAVING VARYING AMOUNTS OF RECREATIONAL ACREAGE WITHIN 25 MILES

	PROPORTION OF OKLAHOMANS HAVING ...					
	No acreage	1-999 acres	1000-2999 acres	3000-4999 acres	5000-9999 acres	1000 or more
Regional Recreation Acreage	34.6%	28.6%	17.7%	9.1%	7.0%	3.0%
Water-Oriented Regional Recreation Acreage	39.3%	24.4%	18.2%	10.0%	5.1%	3.0%

Increasing the Minimum Driving Range

If the driving range limitation is somewhat relaxed, there is a corresponding increase in opportunities. If instead of using twenty-five miles as a range, opportunities are defined in terms of 50 or 75 mile ranges, the proportion of Oklahomans having little or no recreation acreage

Figure 11

Total Water-Oriented Recreational Acreage
Within 25 Miles

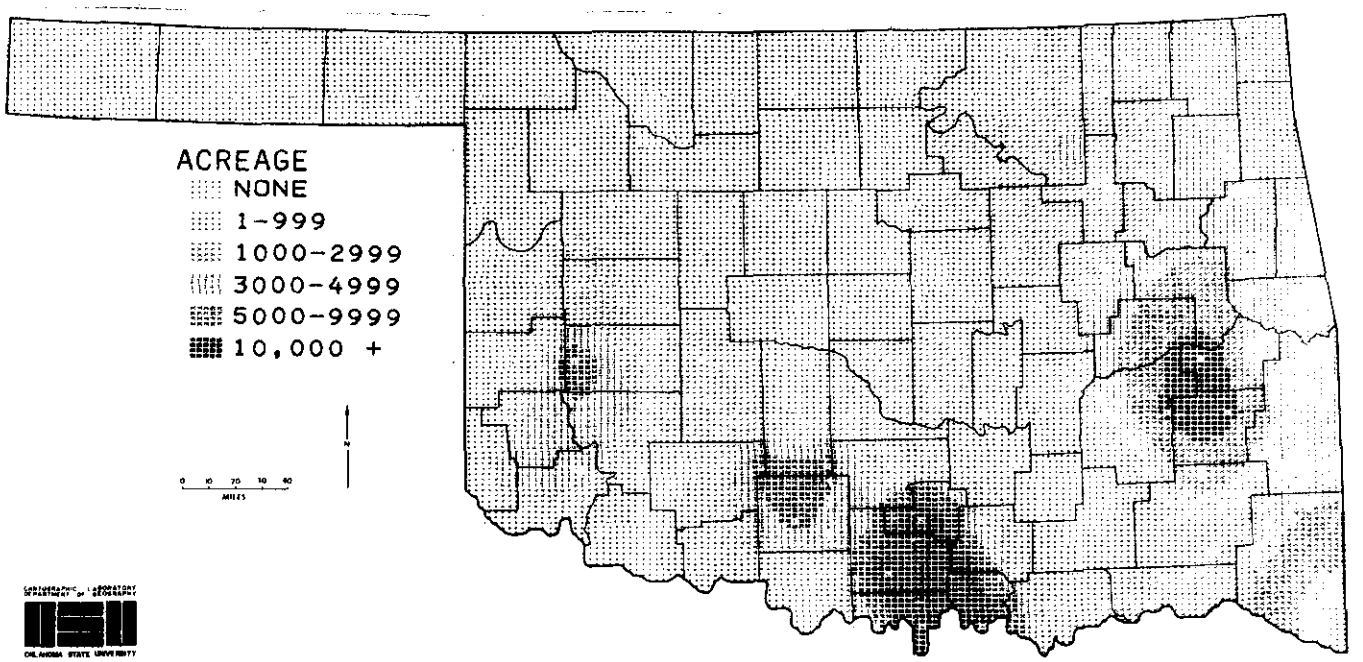
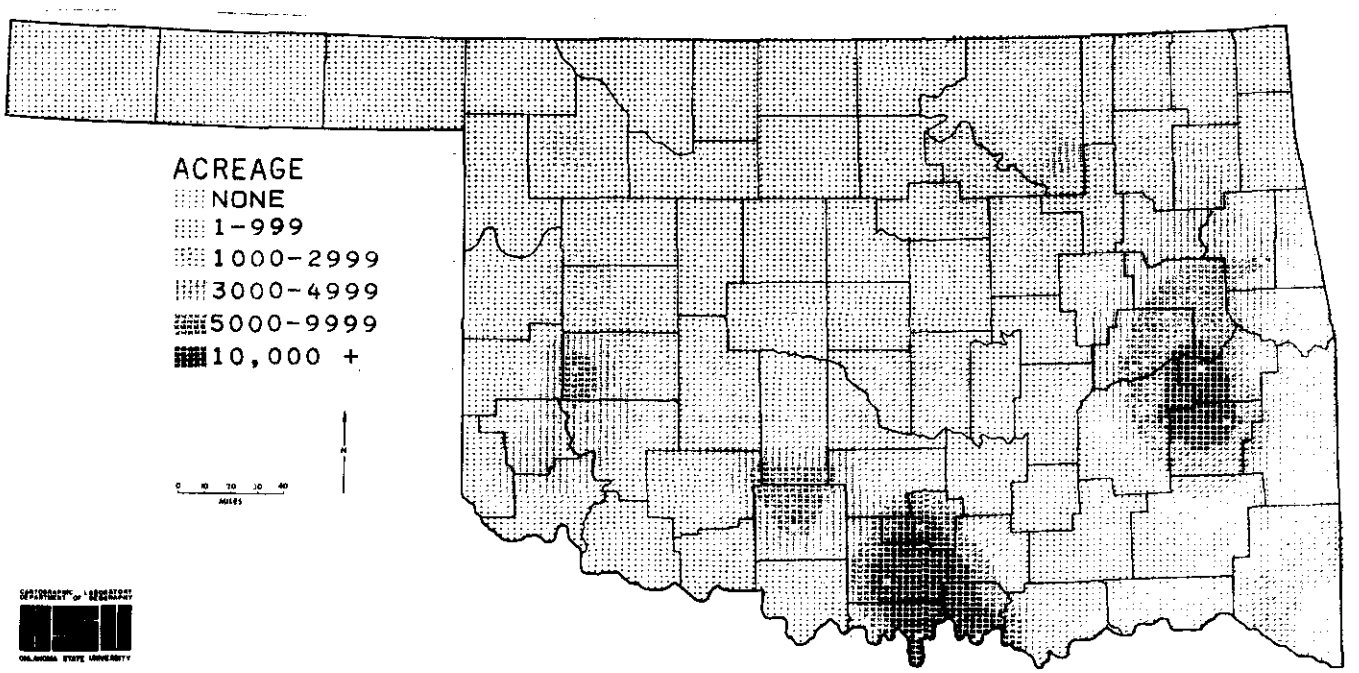


Figure 12

Total Regional Recreation Land Within 25 Miles



nearby, is considerably reduced (Table 5). However, there are still great regional variations in the extent to which Oklahomans are served by recreation facilities (Figures 13, 14, 15, 16).

TABLE 5. OKLAHOMANS AND OPPORTUNITIES: INCREASING THE DRIVING RANGE

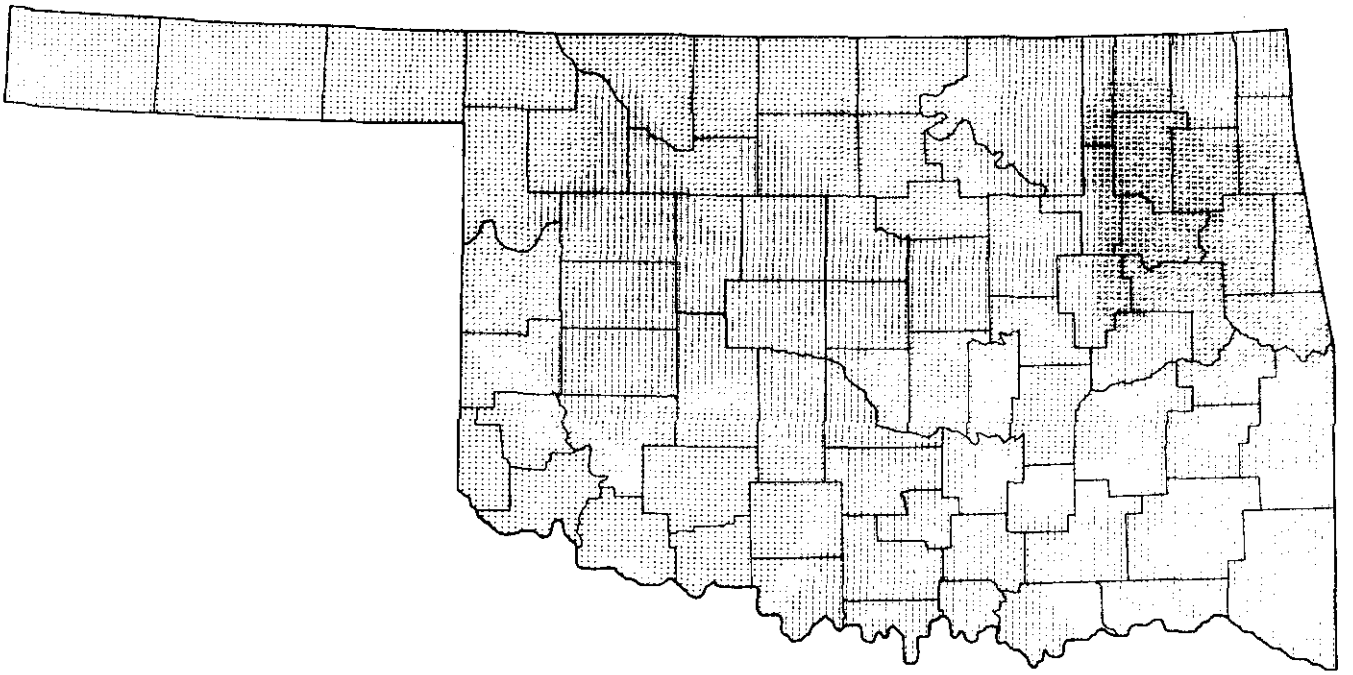
	THE PROPORTION OF OKLAHOMANS HAVING FACILITIES WITHIN....		
	25 miles	50 miles	75 miles
Number of Water-Oriented Regional Recreation Areas			
none	34.1%	.6%	0
1	36.4%	23.2%	.4%
2	12.7%	7.7%	.9%
3-5	12.1%	17.8%	2.9%
6-10	4.7%	24.4%	50.6%
11 or more	0	26.3%	45.3%
Recreation Land Area Associated with Water			
none	39.3%	.7%	0
1-999 acres	24.4%	4.0%	.3%
1000-2999	18.2%	32.2%	3.3%
3000-4999	10.0%	9.3%	2.6%
5000-9999	5.1%	31.0%	31.4%
10,000 and over	3.0%	22.8%	62.3%

The Sharing of Opportunities

A final approach to measuring recreational opportunity takes into consideration the extent to which facilities within a specified driving range of one population center must be shared by other people in the area. The measure employed allows for the reality that a facility within driving range of one population center is also within the range of many other population centers, some of which have many alternative recreational

Figure 13

Recreation Lakes 1000 Acres or Larger Within 50 Miles



Recreation Lakes 1000 Acres or Larger With 75 Miles

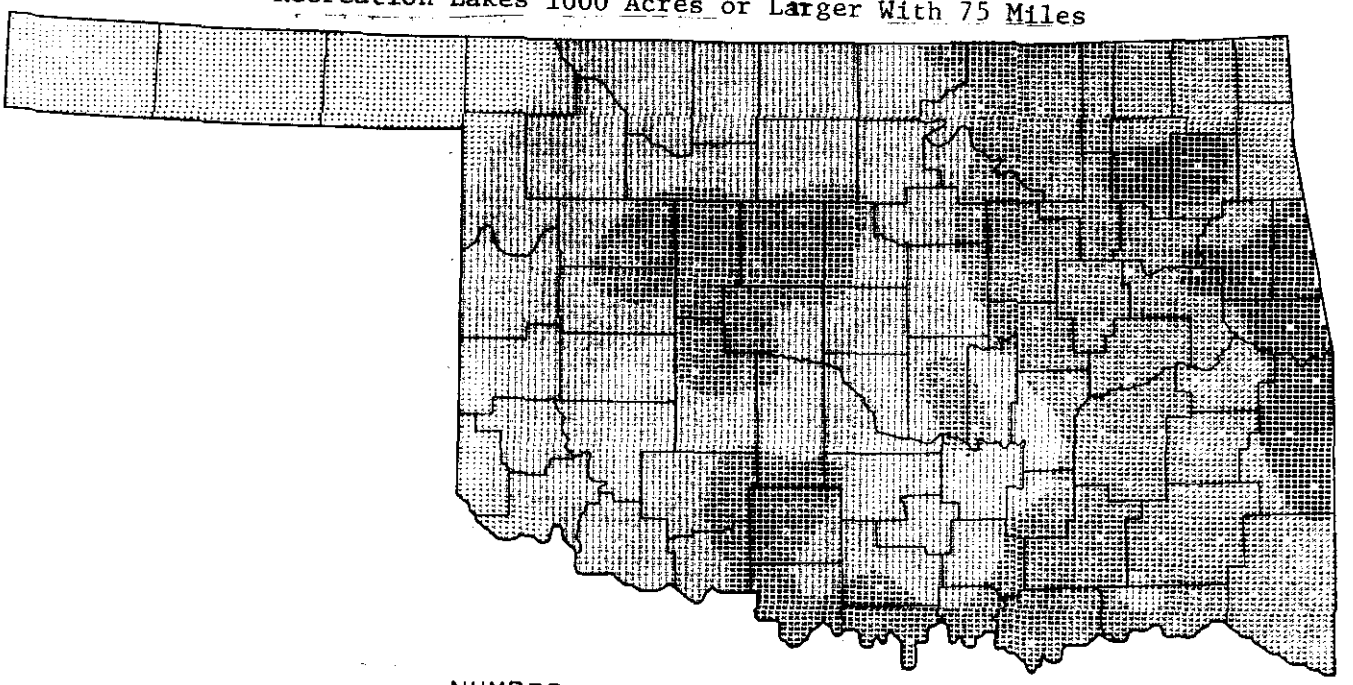
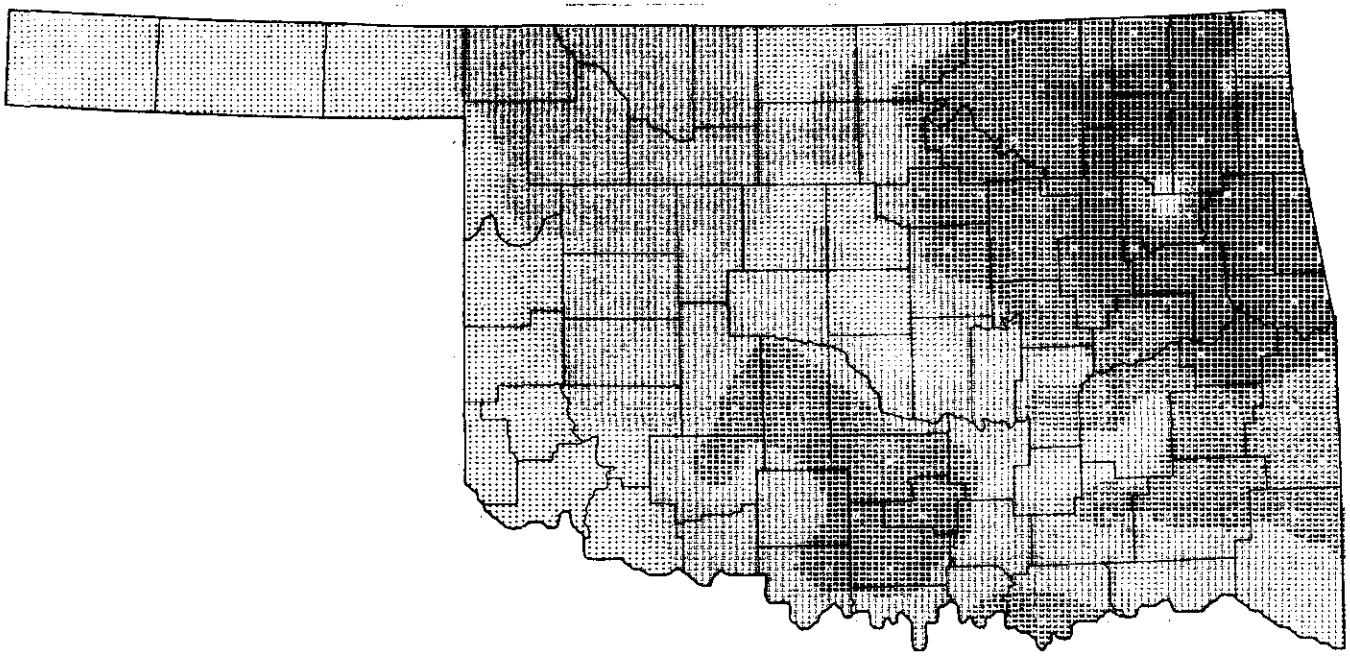


Figure 14

Regional Recreation Areas Within 50 Miles



Regional Recreation Areas Within 75 Miles

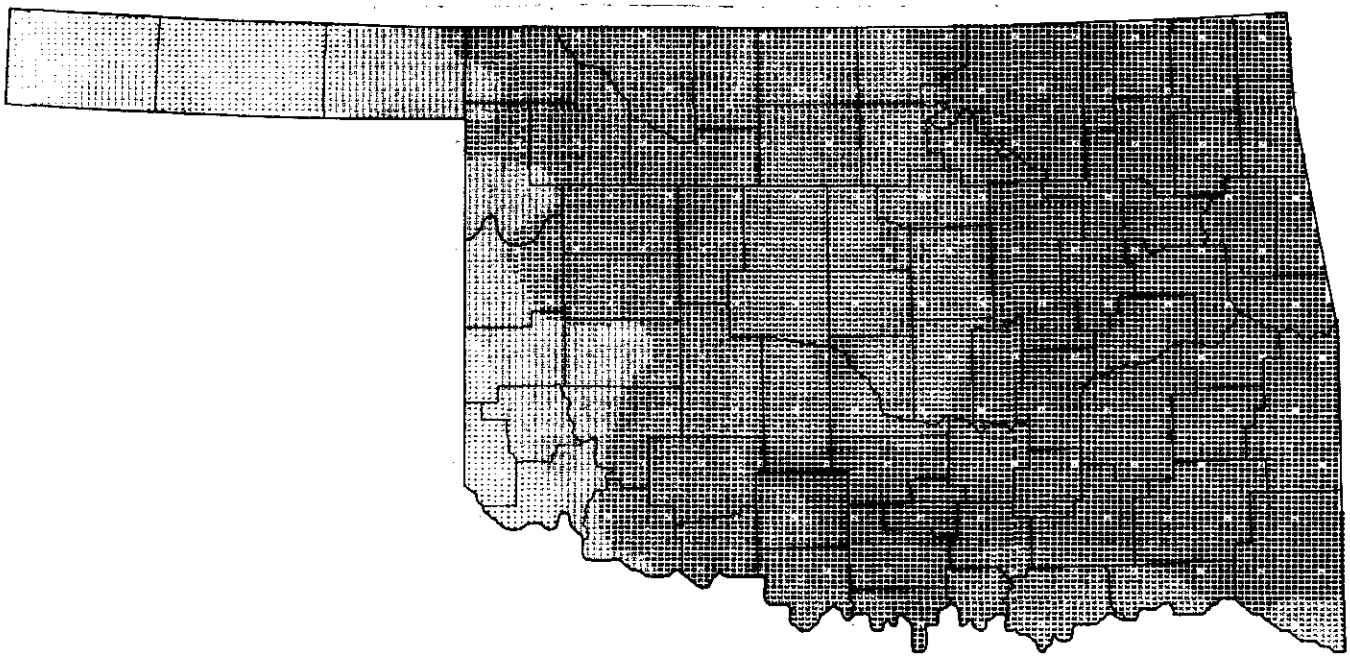
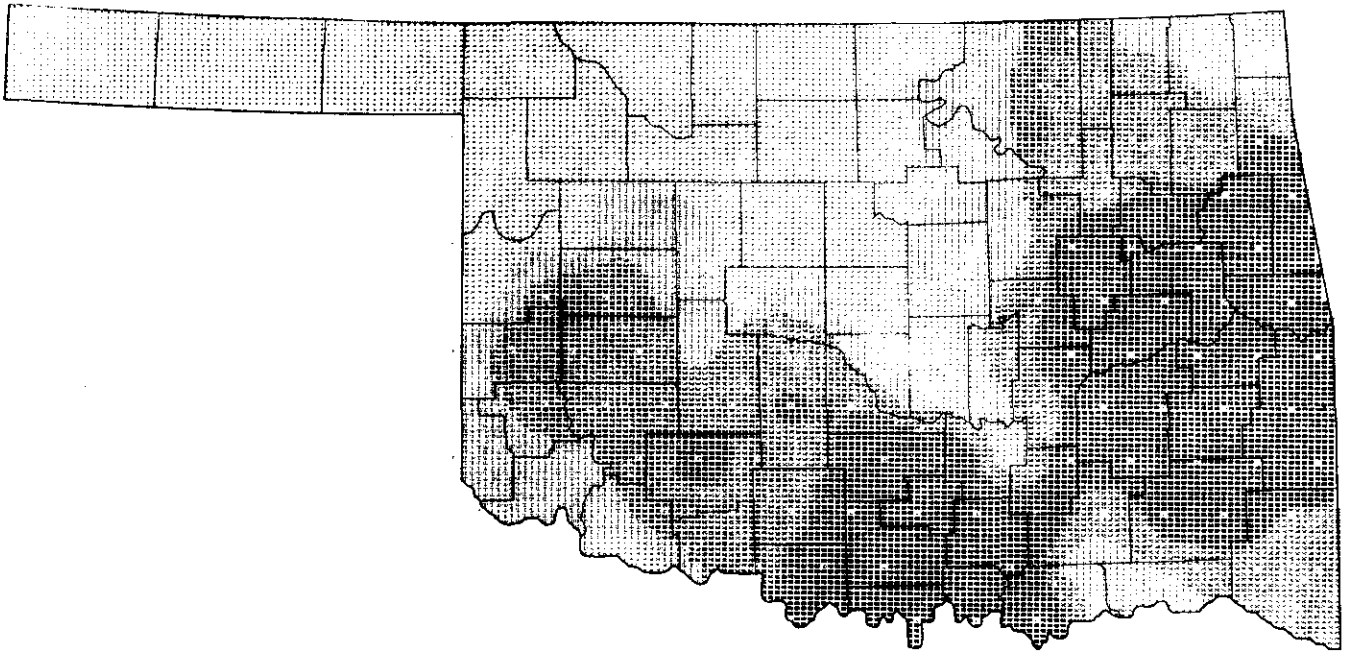


Figure 15

Regional Recreation Land Within 50 Miles



Regional Recreation Land Within 75 Miles

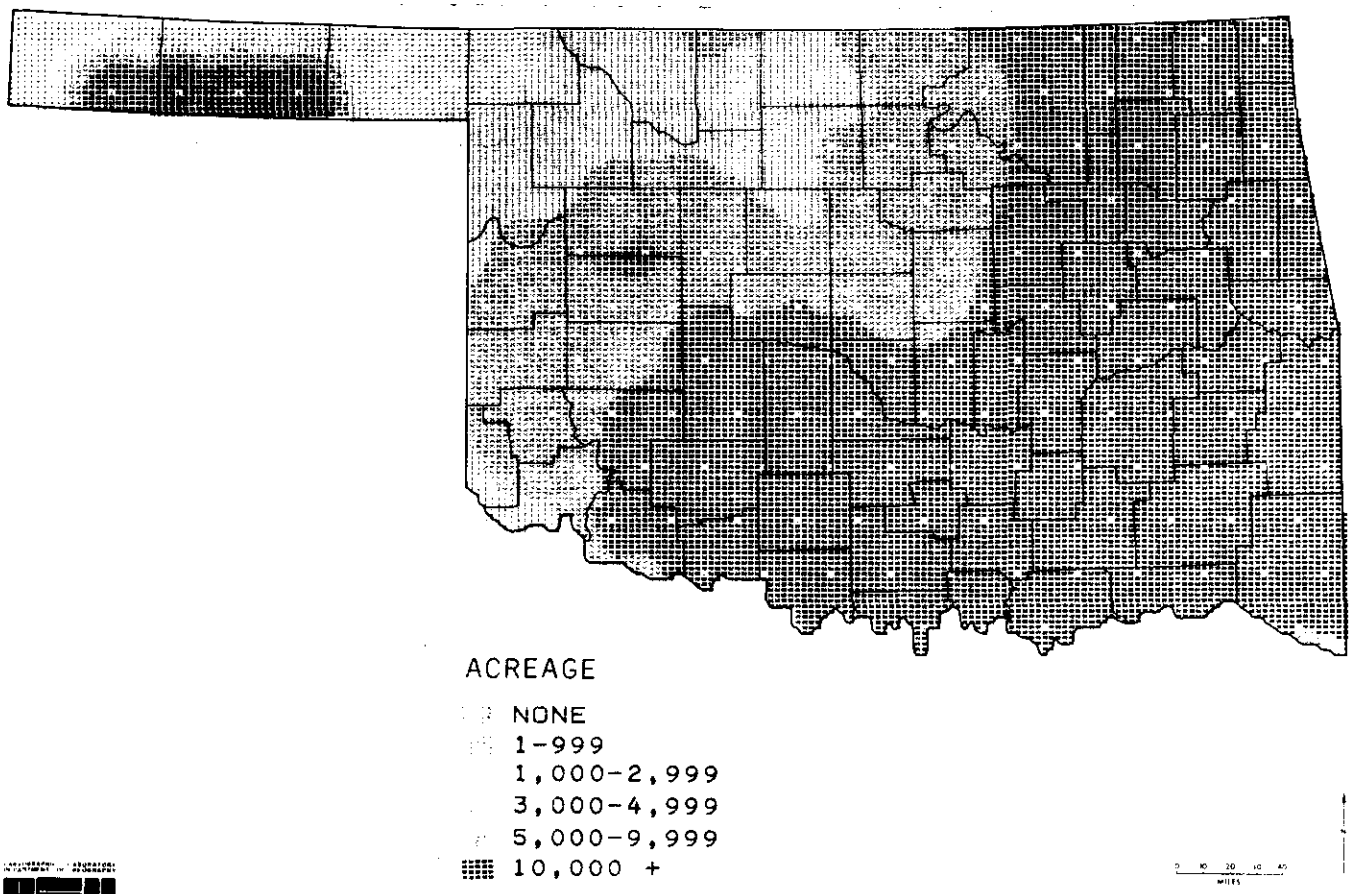
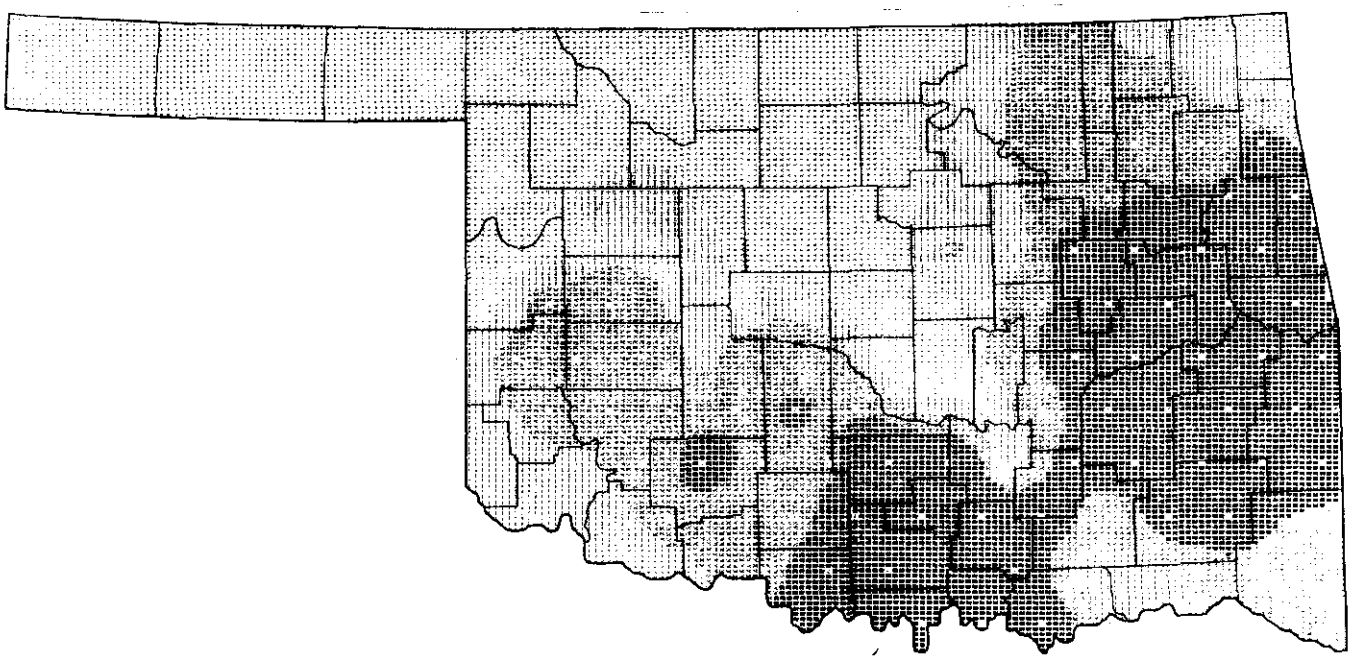
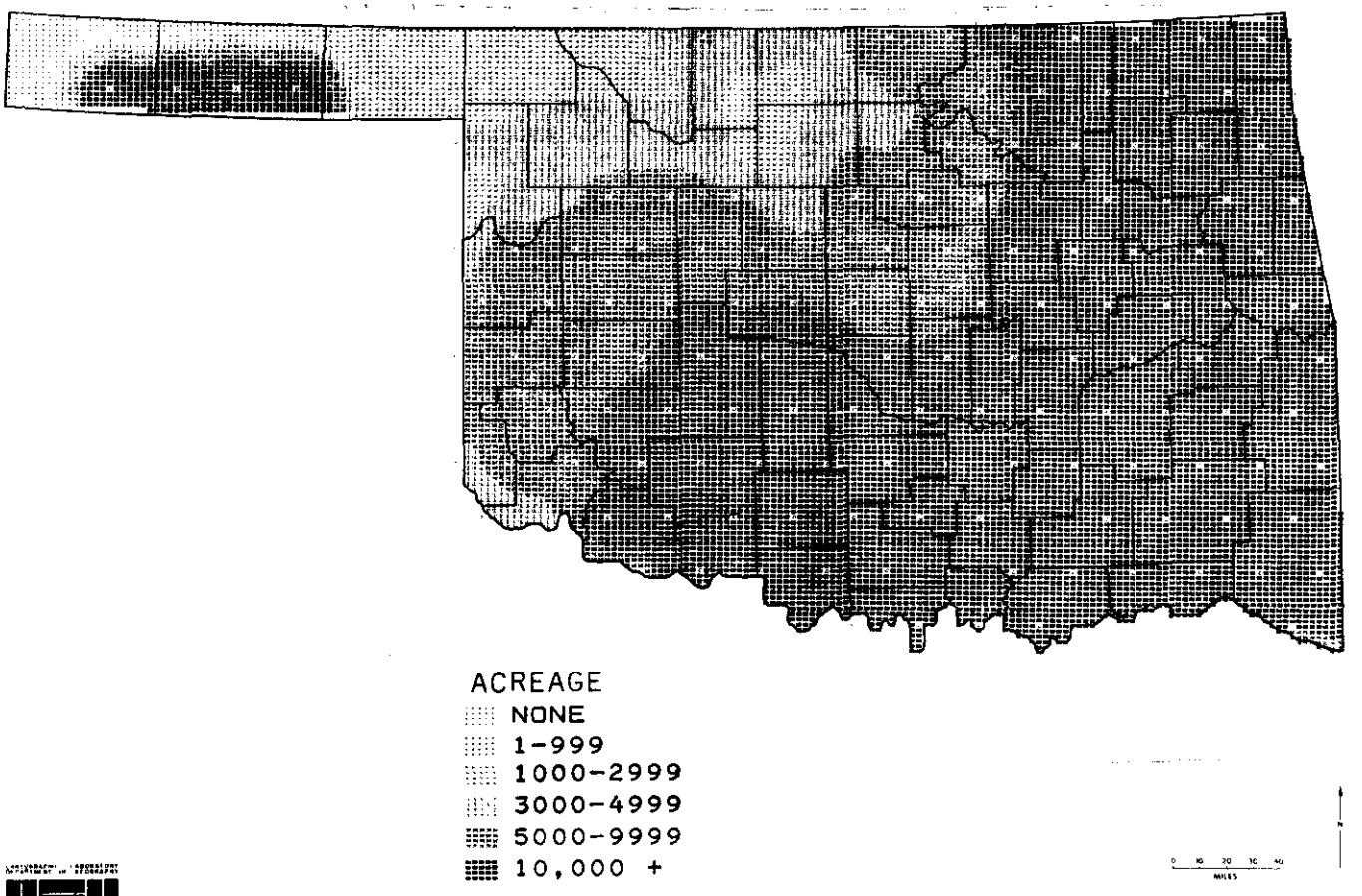


Figure 16

Water-Oriented Recreation Areas Within 50 Miles



Water-Oriented Recreation Areas Within 75 Miles



opportunities (Figure 17). The residents of centers having large and varied recreation facilities nearby may not, in reality, possess great opportunities because these facilities are also within range of large numbers of people who do not possess other opportunities. The shared opportunity measure suggested here is expressed as a percapita share of regional recreation resources within a specified dring range.[9] Note that both the availability of non-Oklahoma recreational resources and the competition for recreational resources by non-Oklahomans is taken into consideration.

Some Oklahomans must share their recreational opportunities to a much greater extent than others. If it is assumed that people are willing to drive 50 miles to obtain certain recreational facilities, almost sixty percent of all Oklahomans have less than five acres of regional recreation area per thousand population. Increasing the distance for which people are expected to (or would) travel to seventy-five miles improves the picture somewhat, but a large proportion of the population still receives only a miniscule share of the regional recreation land area (Table 6).

There is an important geographic dimension to this situation as well. Competition for opportunities is much greater in some parts of the state than in others (Figure 18). Since the pattern is a function of relative locations of population and recreational facilities those areas which have low populations within close proximity to at least some recreation space are highlighted - the eastern and southwestern parts of the State for example. Areas which possess large numbers of people and fail to

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[9]Dr. Stephen W. Tweedie developed the computer algorithm for this measure.

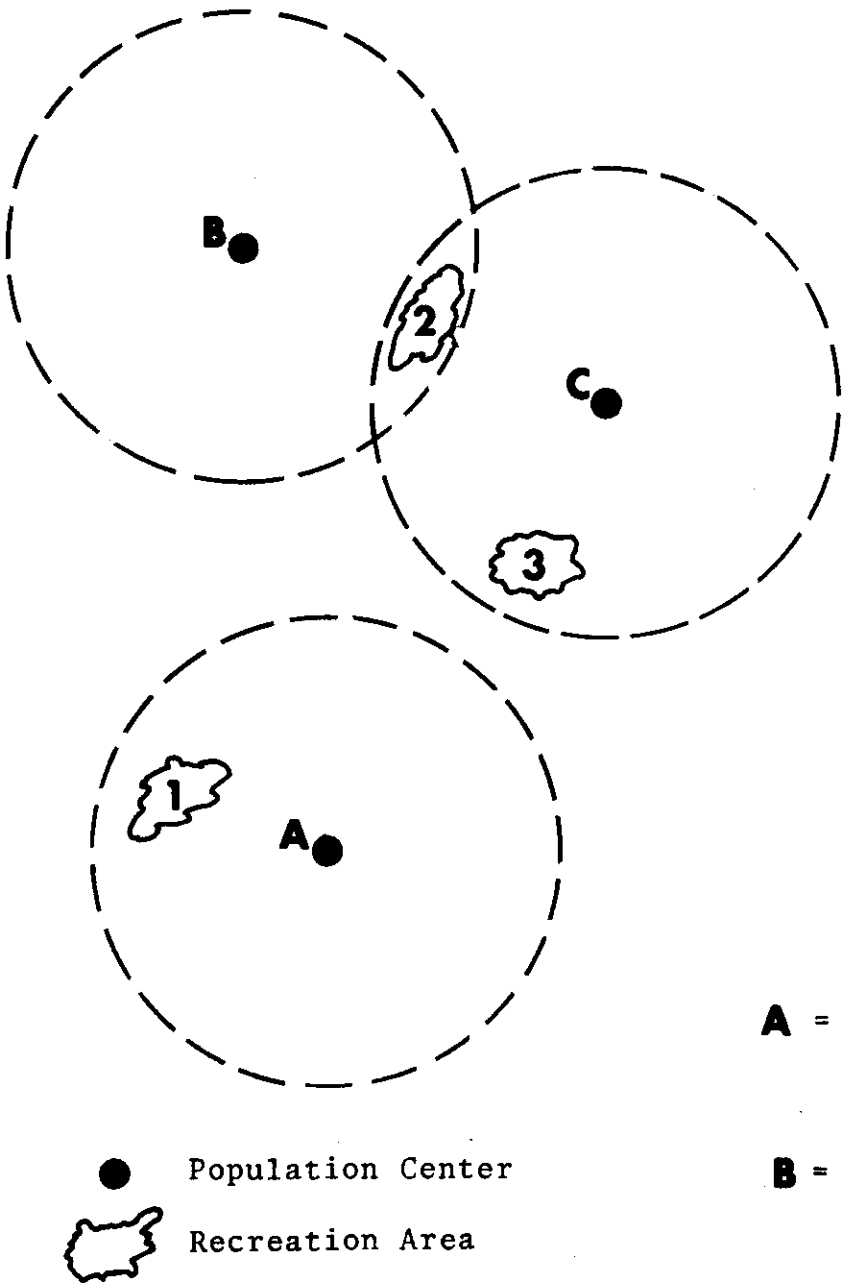


Figure 17 - Schematic Diagram Showing Several Competitive Situations for Outdoor Recreation Resources

TABLE 6. OKLAHOMANS SHARE OF OPPORTUNITIES

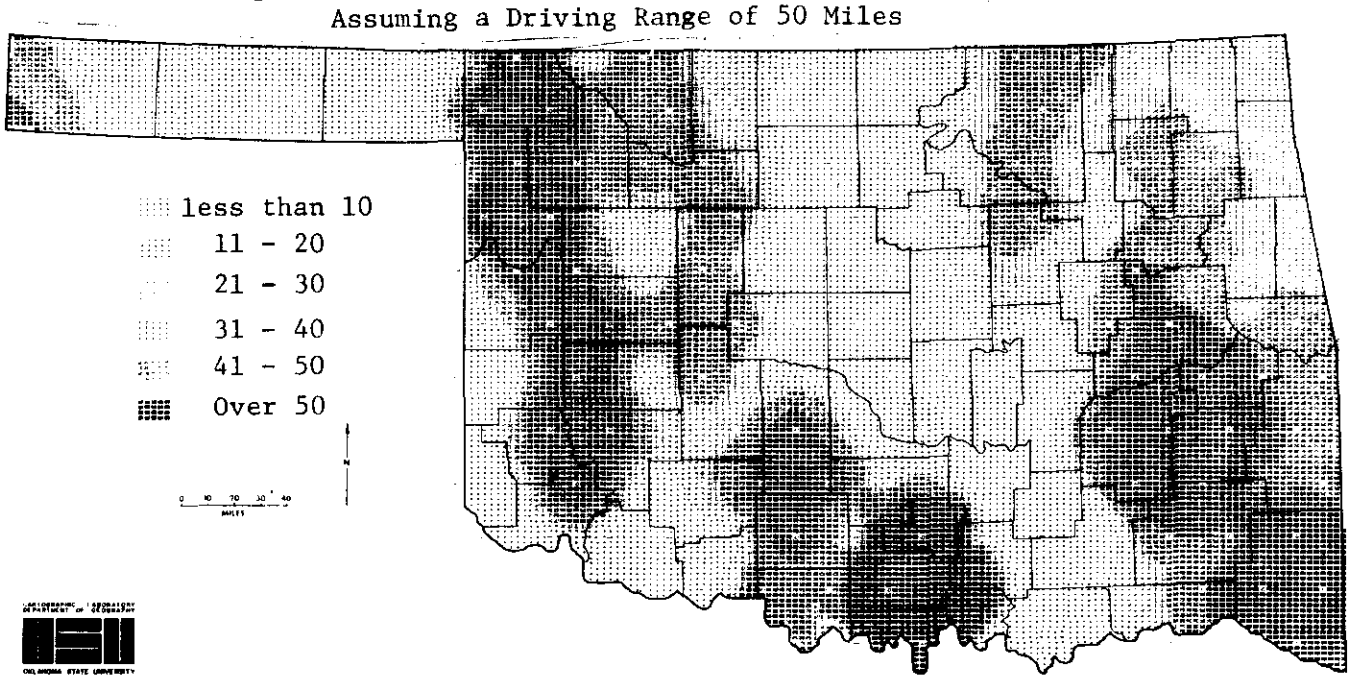
The Proportion of Oklahoma Population having various levels of shared opportunity, using 50 and 75 mile willingness to travel assumptions.

	50 miles	75 miles
Available Recreation Acres per 1000 persons		
0 to 5	57.9	38.0
6 to 10	14.4	27.9
11 to 50	14.2	18.7
51 and more	13.4	15.4
Available Surface Acres of Water per 1000 persons		
0 to 10	30.9	10.9
11 to 20	28.2	24.8
21 to 50	13.2	16.7
51 and over	27.7	47.6

have correspondingly large amounts of recreation space nearby are portrayed at the opposite end of the scale. The north central part of the State is noteworthy in this respect.

Figure 18

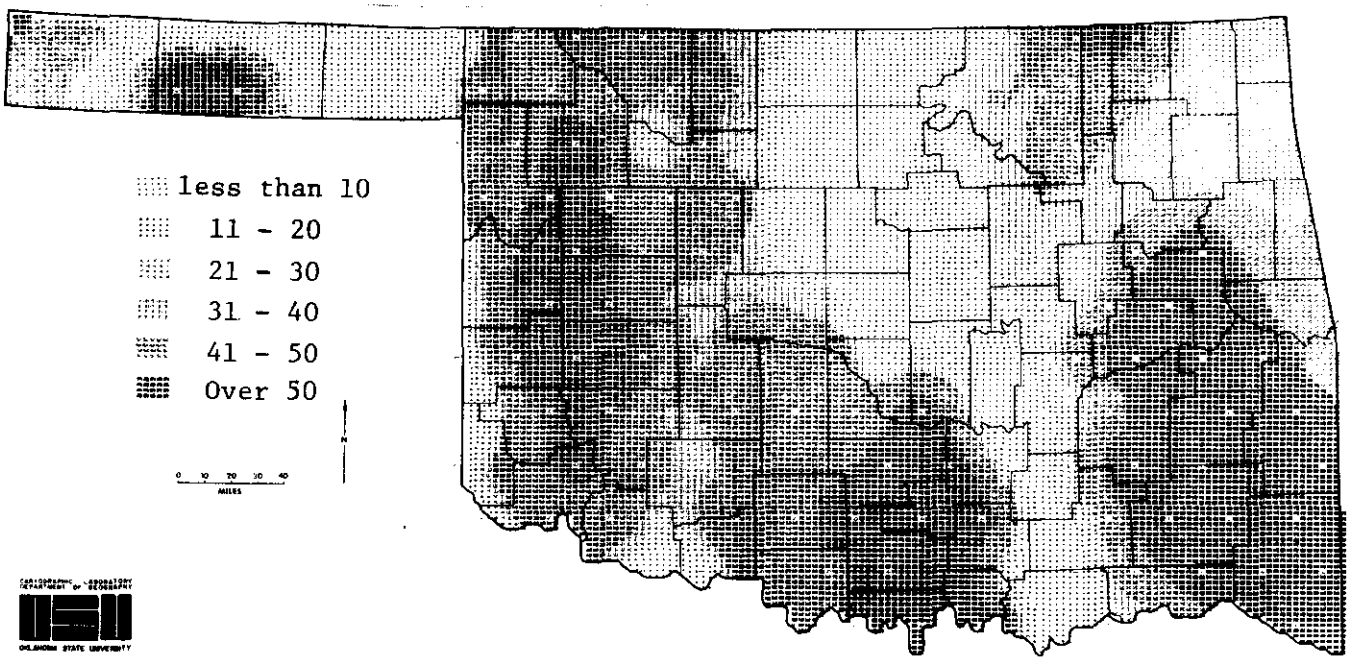
Regional Recreation Land: Acres Per 1000 Persons
Assuming a Driving Range of 50 Miles



If it is assumed that people would (or should) be willing to travel farther (that recreation market areas are really larger) to obtain a certain type of recreational resource, there are some expectable changes in the extent to which residents in different locations have opportunities which are shared (Figure 19). A larger segment of the southeastern part of the State has access to a greater magnitude of recreational resources and the Panhandle also has a more favorable situation. But for some areas, increasing the assumed travel distance results in a reduction in opportunities. For example a driving range of 75 miles brings the large populations of Tulsa and Oklahoma City into competition for recreational resources in the East Central and South Central parts of the State.

Figure 19

Recreation Land: Areas per 1000 Persons Assuming Driving Range of 75 Miles



Even when the focus is on the very large water surface area of the State, a similar situation exists. People in most areas of the State have only a very small amount of water surface if they must share with all who are within driving range (Figure 20). Only the small concentration of people living close to the reservoir-rich eastern one-quarter of the State and near the very large Lake Texoma area are generously provided with opportunities. Moving away from these areas, the surface acreage share diminishes rapidly as the concetration of people increases.

Increasing the assumed driving distance to 75 miles, aggravates the supply situation for many Oklhomans (Figure 21). If people are willing, or expected to, drive 75 miles to reach such a recreational resource, the major population centers are within reach of most of the major water resources, thereby reducing the opportunity measured in this way.

Figure 20

Recreation Lakes: 1000 Acres or Larger: Surface Acres Per 1000 Persons Assuming a 50 Mile Driving Range

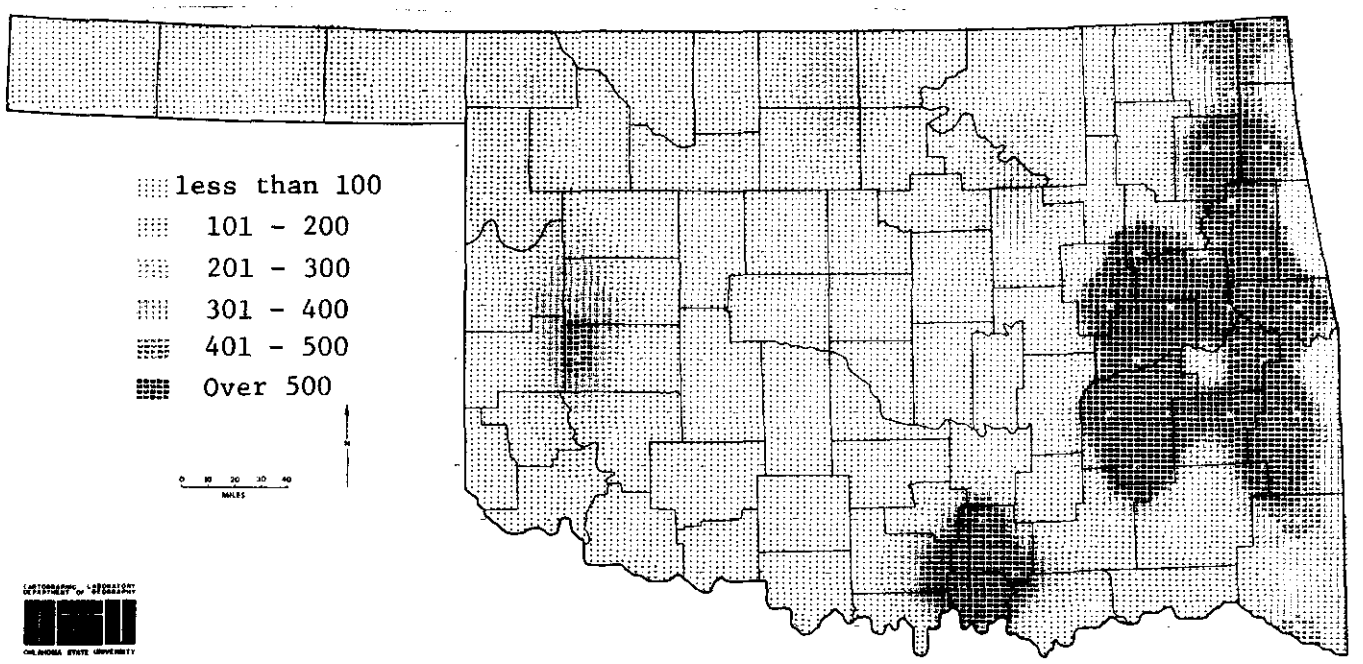
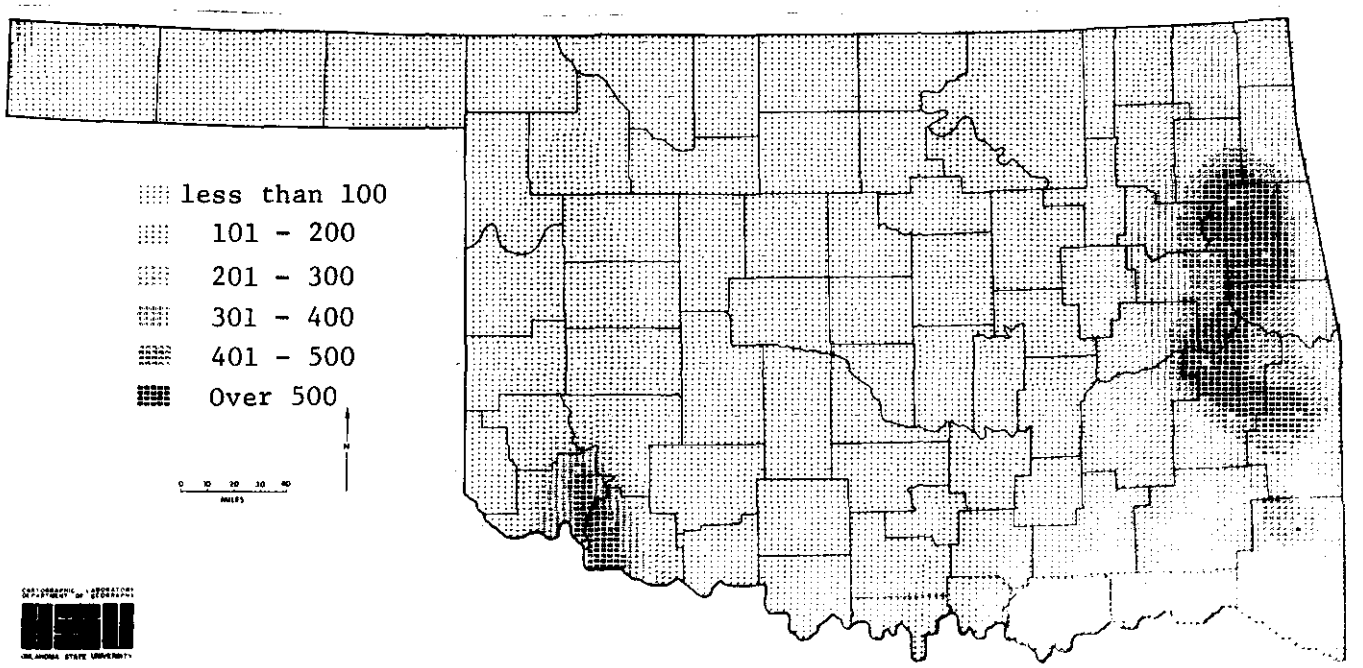


Figure 21

Recreation Lakes: 1000 Acres or Larger: Surface Acres Per 1000 Persons Assuming a 75 Mile Driving Range



CHAPTER 3

CHANGING RECREATIONAL OPPORTUNITIES: PLANNING FOR PROGRESS

The approach described in Chapter 2 can be readily adapted to assist in the assessment of recreational resource changes. Specifically, proposed facilities can be evaluated in terms of their effects upon recreational opportunities, or new facilities can be suggested, based upon an evaluation of existing opportunities and needs.

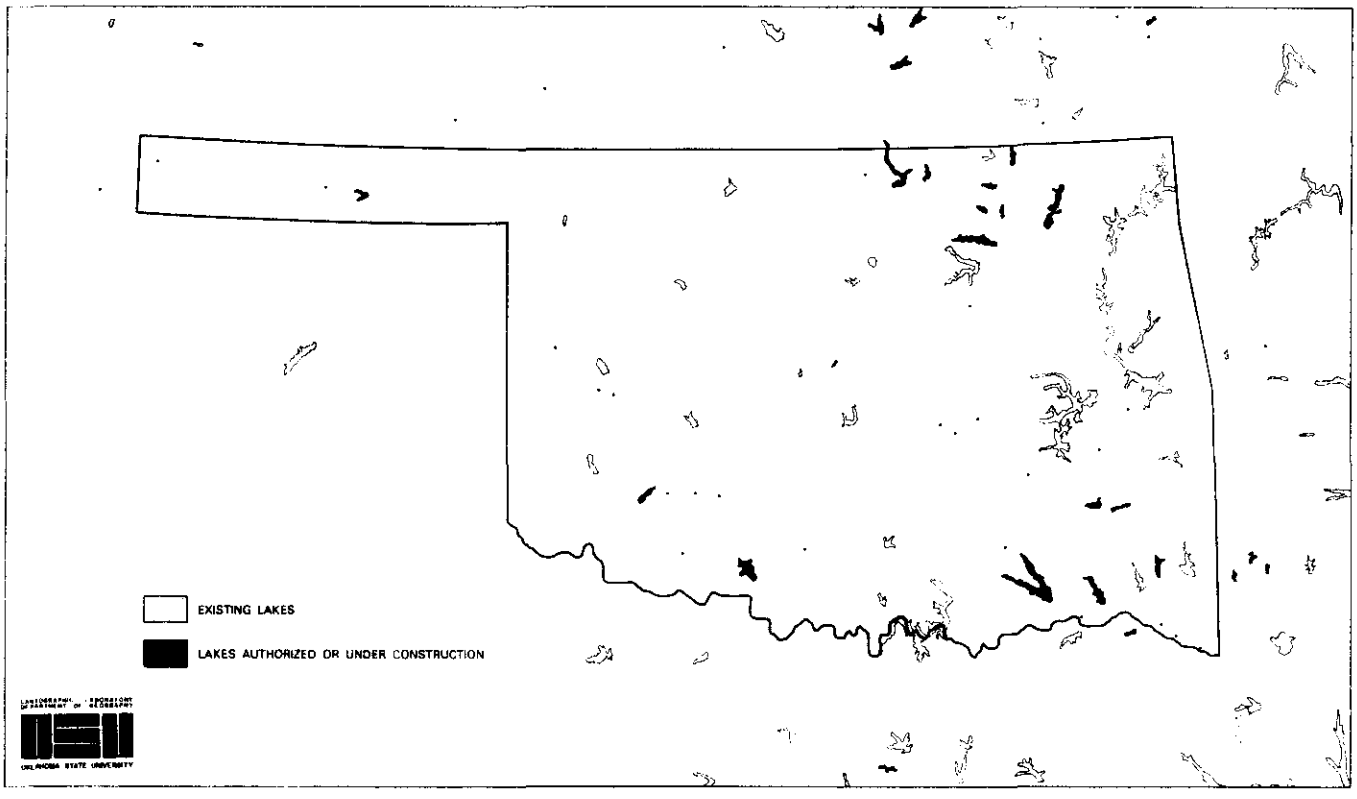
Planned Additions to Oklahom's Recreation Resource Base

Oklahomans can expect quite a number of changes in their recreational resource base in the next few years. It seems likely, for example, that acreage will be added to the State Park system. A "trails" Bill is currently before the State legislature. There are current plans which call for development of additional recreational facilities in connection with the Kerr McClellan waterway. Debate continues over plans to turn over large amounts of Federal Land to the State for outdoor recreation development. And a number of new reservoirs, are either currently under construction or have been authorized by Congress for the near-future (Figure 22).

These reservoirs, representing nearly one quarter of a million surface acres are being developed in Oklahoma and adjacent States. When associated recreational facilities are fully completed they will provide a major increase in the recreational resources of the Region. But important questions remain. What changes in recreational opportunities do such additions to the recreational resource base bring to Oklahoma and Oklahomans? What are the changes in the number and types of opportunities? What are the changes in extent of opportunities which will accompany these additions?

Figure 22

Present and Future Reservoirs



Changing Opportunities for Water-Oriented Recreation

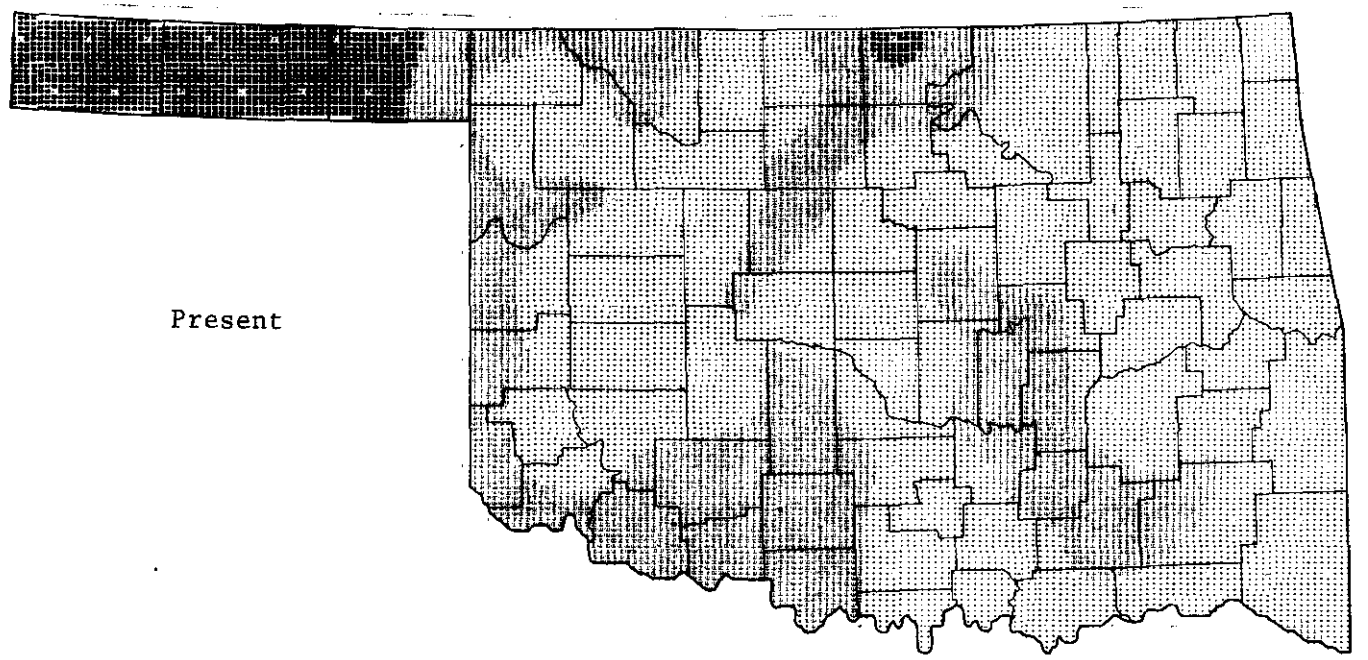
Comparison of the accompanying map pairs indicates that some important changes in opportunities are likely as a result of the development of these additional recreation lakes (Figures 23, 24, 25, 26).Today there are many State residents, particularly those in the southwest and far-west, who must travel more than twenty-five miles to recreate at even a relatively small lake (Figure 23), and Panhandle dwellers along with a small group in Grant county, must travel well over fifty miles for the same type of rather limited recreational opportunity. When proposed developments of reservoirs are realized, the accessibility of the poorly served regions will improve. Except for Cimarron County, all state residents will be within fifty miles of a lake of 1000 acres or larger. There will still be limited opportunities in the far-west and southwest, where no new facilities are currently anticipated.

The present accessibility to the larger (5000 acres or more) reservoirs is very similar to the other group. Inaccessibility is accentuated in the Panhandle and northwestern portions of the state as well as in the southwest. Residents in north-central Oklahoma, particularly those living in Grant and Lincoln counties are also poorly served. Projected additions of larger lakes will improve the situation in the Central Panhandle and in the Southwest. Inequality of opportunities will be eased somewhat in the Southwest and the Southeast as well. Only central Oklahoma's Lincoln County and a wedge in the northwest will continue to be poorly served.

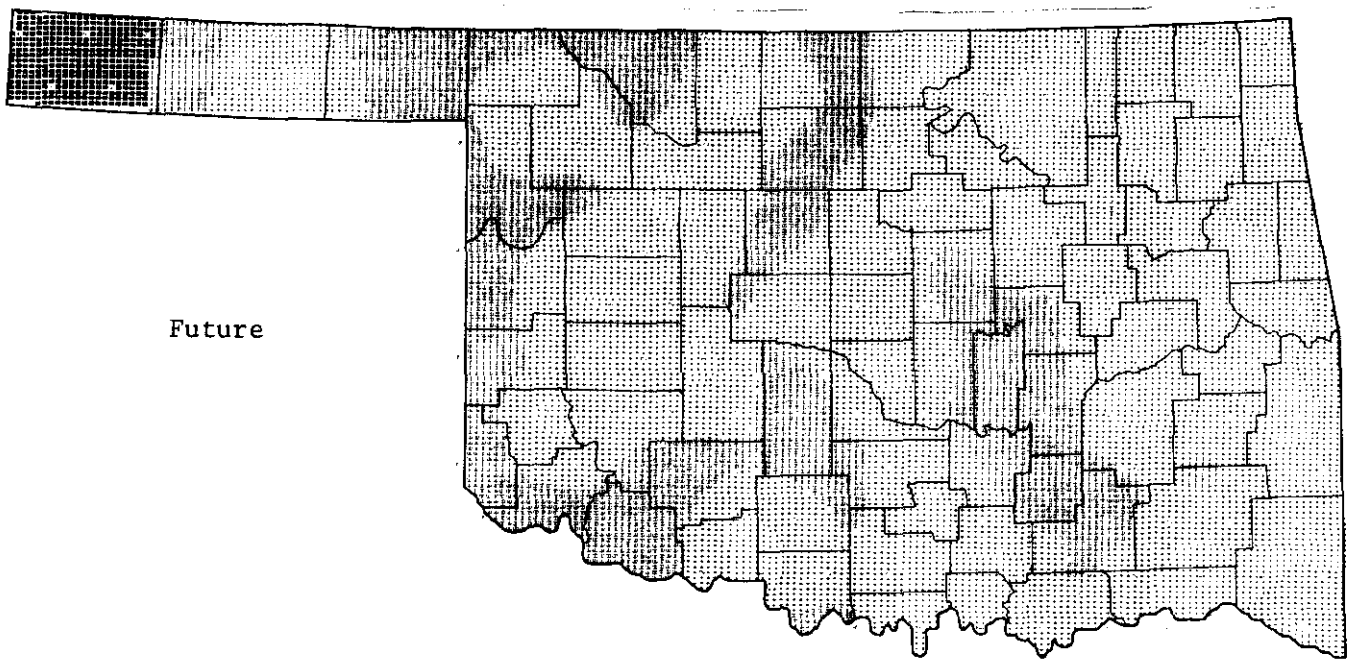
With respect to the sharing of opportunity capacity, a somewhat different picture emerges (Figure 25). Those living in the Panhandle

Figure 23

Distance to Nearest Recreation Lake of 1000 Acres or More:



Present

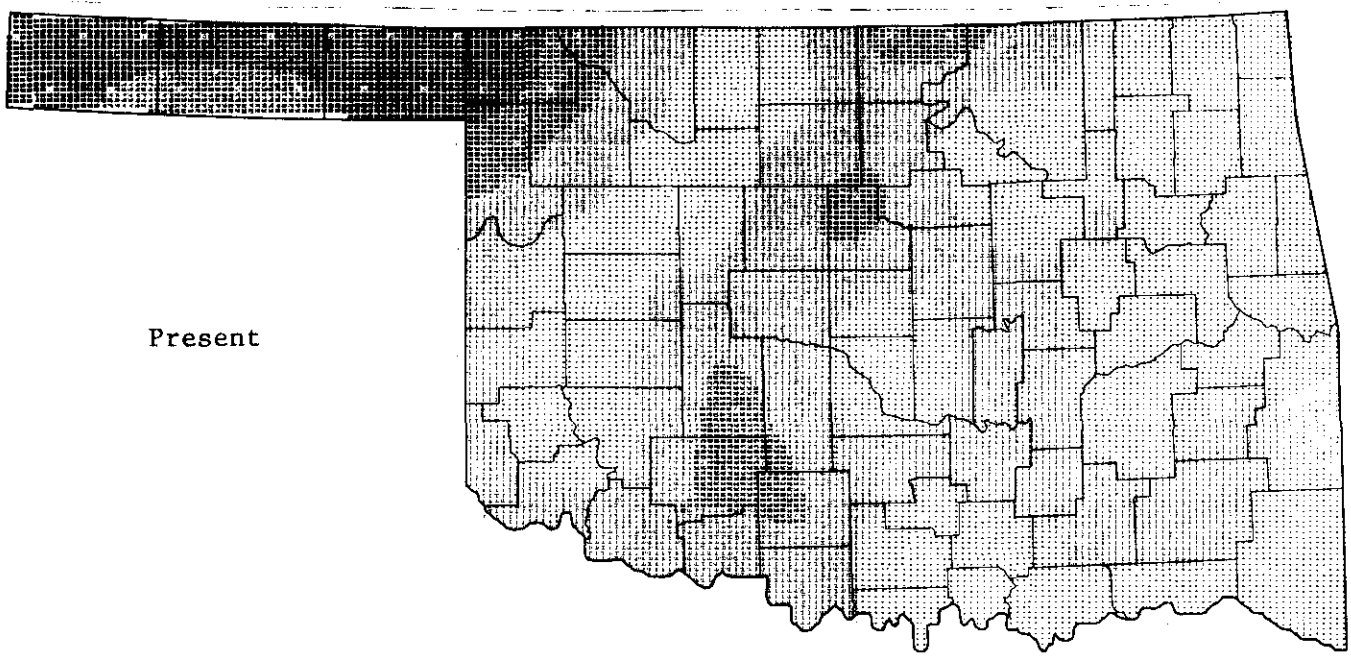


Future

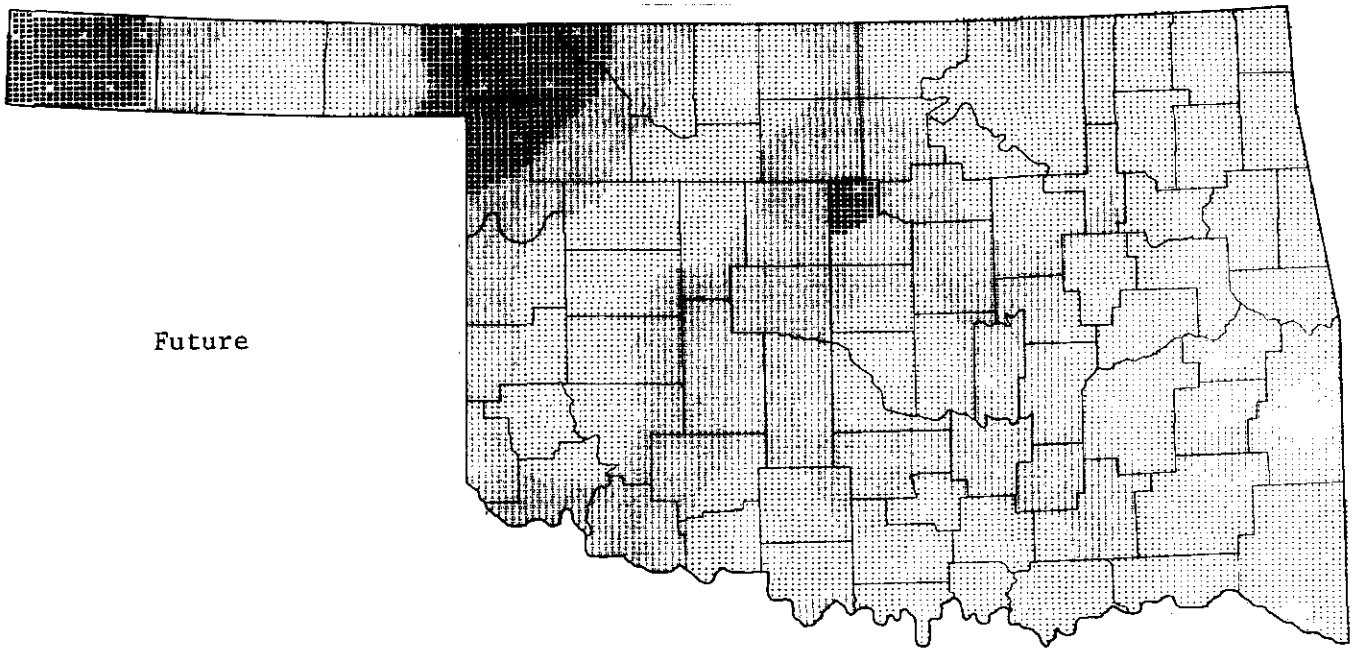
DISTANCE
0-10
11-25
26-50
51 +

Figure 24

Distance to Nearest Recreation Lake of 5000 Acres or More:



Present

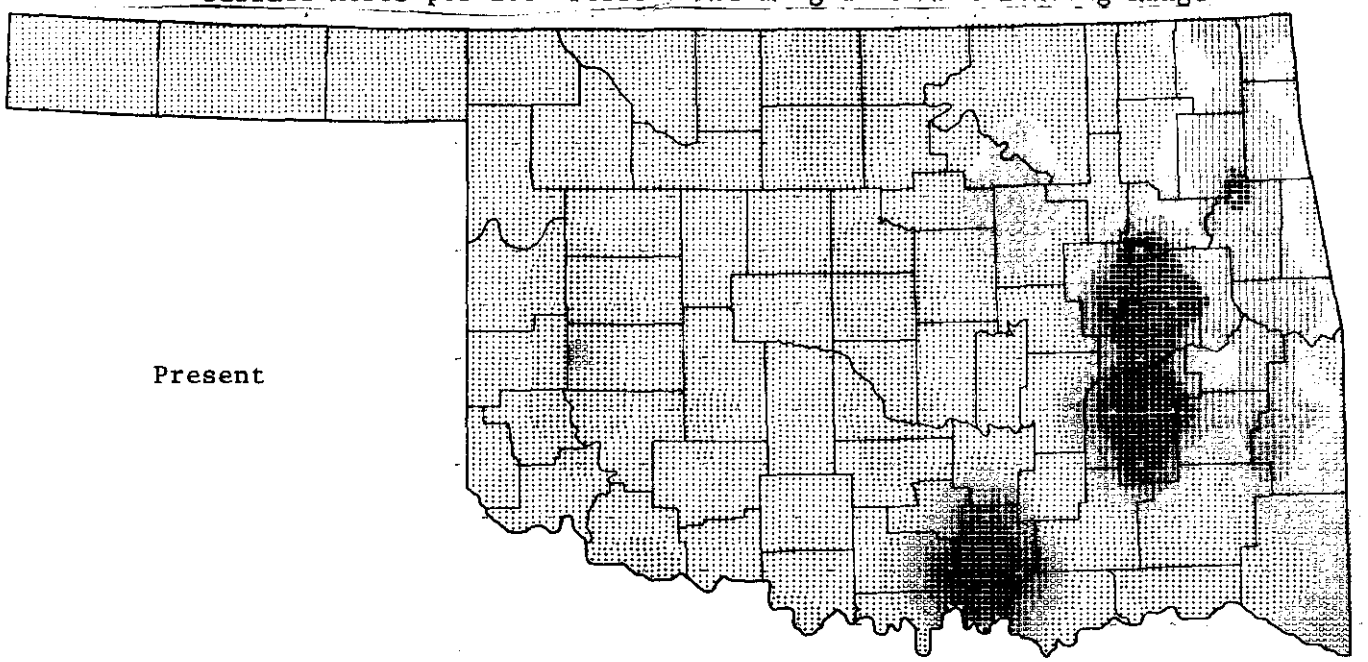


Future

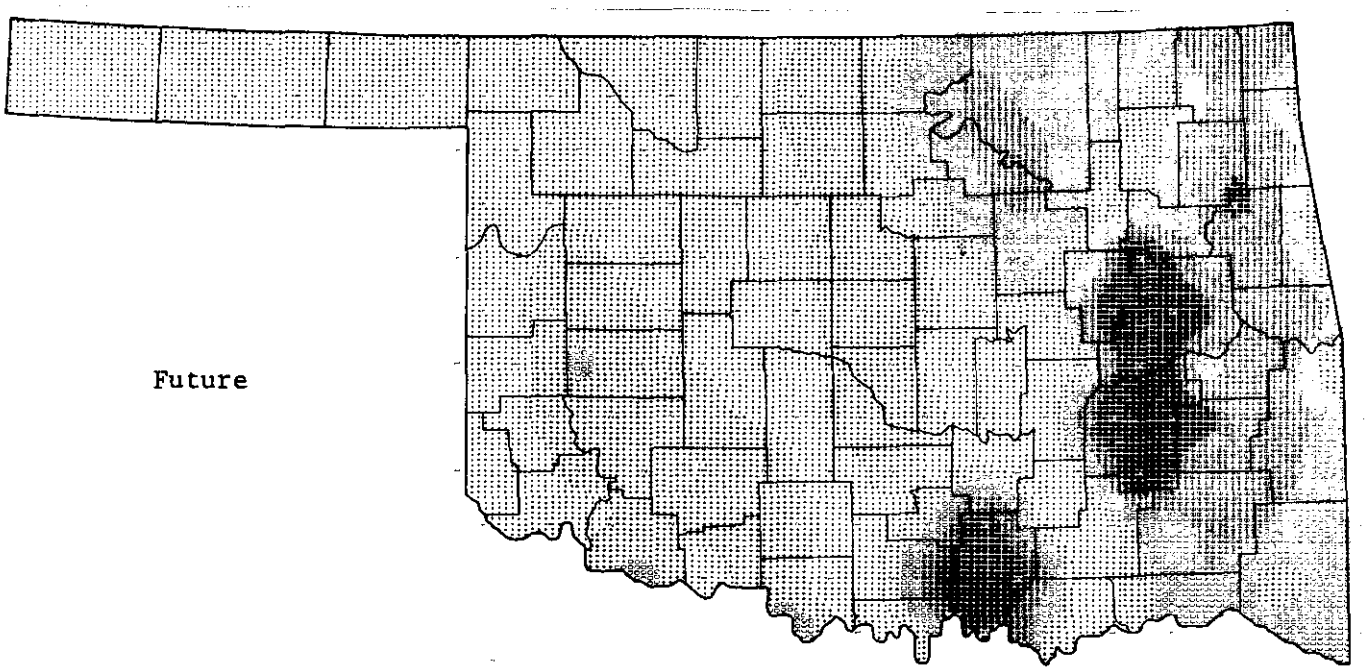
DISTANCE
0-10
11-25
26-50
51 +

Figure 25

Present and Future Competion for Recreation Lakes (1000 Acres or More): **Surface** Acres per 1000 Persons Assuming a 50 Mile Driving Range



Present



Future

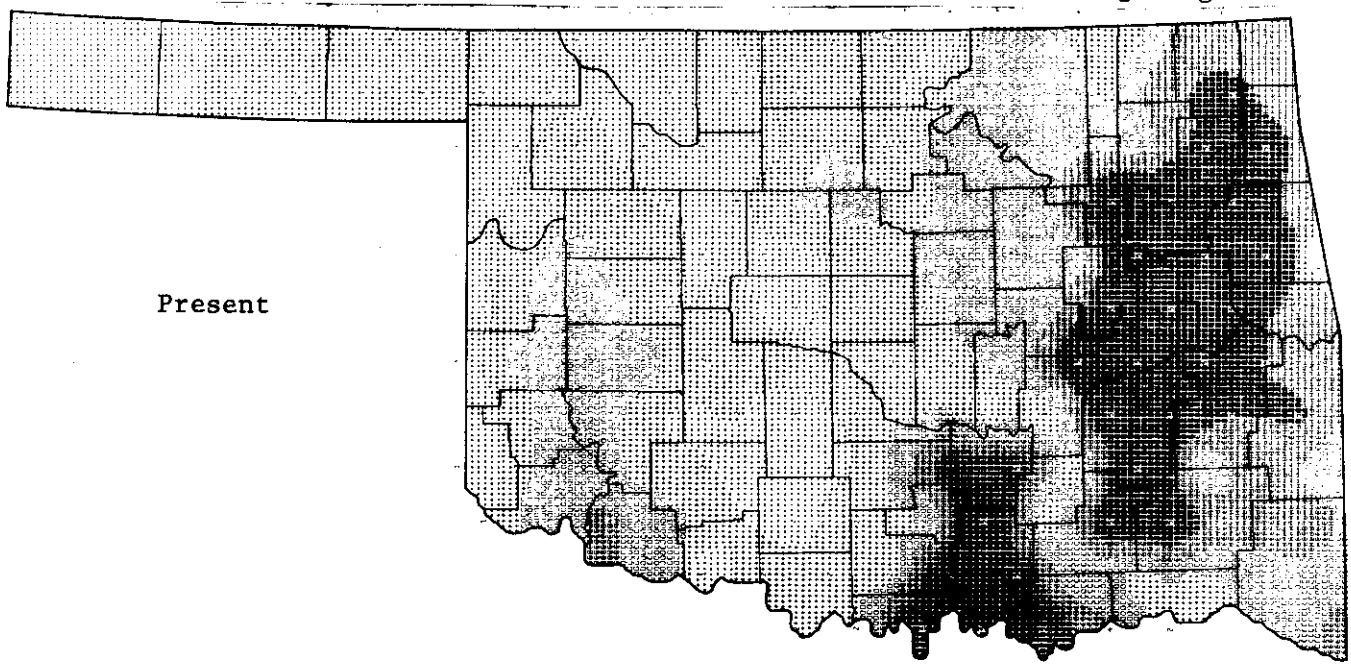
ACRES PER 1000 PERSONS

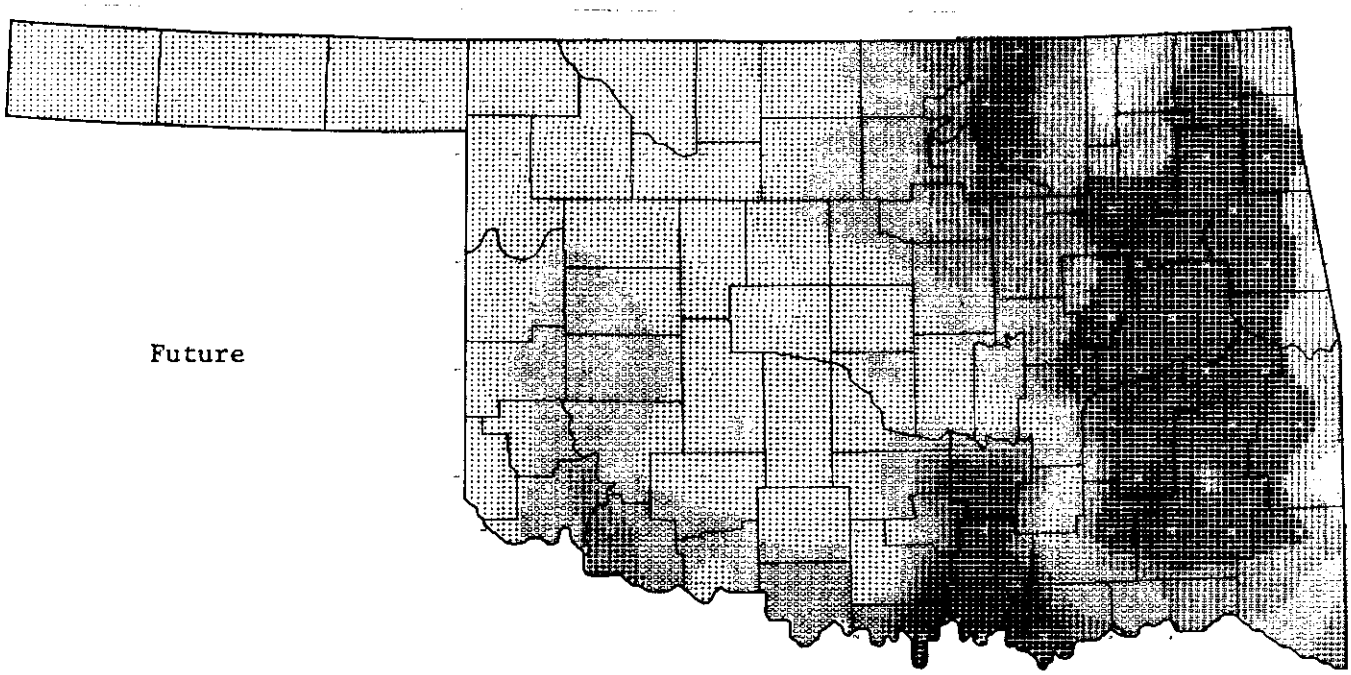
- 0 - 5
- 5 - 15
- 16 - 40
- 41 - 75
- 76 +

0 10 20 30 40
MILES

Figure 26

Present and Future Competition for Recreation Lakes (1000 acres or more): Surface Acres per 1000 Persons Assuming a 75 Mile Driving Range





Acres per 1000 persons

- 0 - 5
- 5 - 15
- 16 - 40
- 41 - 75
- 76+

are joined by the large number of persons living in the heavily populated portions of the State, especially in the areas near Oklahoma City, in having relatively low shares of water recreation opportunities. But with the development of new reservoirs a few important changes take place. Persons in the north-central part of the State have considerably enhanced opportunities with the addition of a large Arkansas River reservoir, and the presence of several new but smaller reservoirs within reach of those in the eastern part of the State substantially enhances their relative share. The general pattern of changes in the share of opportunities appear to hold regardless of whether fifty-mile or seventy-five mile travel distances are assumed.

From the foregoing it appears that there will be measureable improvement in water-oriented recreational opportunities for many parts of Oklahoma in the next few years. People in several areas of the State will be better served. Nonetheless, considerable geographical variation in the extent of recreational opportunities will persist.

Evaluation of the improvement of opportunities for Oklahomans as a group, however, provides mixed evidence regarding the importance of the changes. For example, the proportion of Oklahomans having a large range of recreational lake choice within a fifty mile range of their homes increases from 26% to 37% with the addition of these new facilities, and whereas currently only about half of the population have at least six areas to choose from within 75 miles now, 95% of them will have six or more choices within seventy-five miles upon completion of these facilities (Table 7). On the other hand, the proportion of people who have to travel more than fifty miles to reach a recreation lake only decreases from about 31 percent to 28 percent with the

Table 7

Proportion of Oklahomans Having Various Levels of Water-Oriented Recreational Opportunities* Present and Future

Number of Recreation Lakes	Present	Future
Within 25 Miles		
none	18.3%	10.7%
1	45.5	38.0
2	29.0	16.3
3-5	7.2	33.2
6-10	0.0	0.9
11 or more	0.0	0.0
Within 50 Miles		
none	1.2%	0.6%
1	12.7	2.8
2	14.6	6.0
3-5	46.0	94.6
6-10	25.5	31.1
11 or more	0.0	9.9
Within 75 Miles		
none	0.1%	0.0%
1	1.3	0.3
2	0.4	1.1
3-5	49.6	2.2
6-10	42.7	91.6
11 or more	6.1	44.9

*Include Recreation Lakes Greater than 100 Acres

addition of these new facilities (Table 8), and the proportion of the

TABLE 8. PROPORTION OF OKLAHOMANS HAVING VARIOUS LEVELS OF WATER-OREINTED LAKE OPPORTUNITIES, PRESENT AND FUTURE

	Present	Future*
Distance to Recreation Lake of 1000 Acres or More		
10 miles or less	21.3	23.7
11 to 25 miles	46.8	48.6
26 to 50 miles	30.6	27.5
over to miles	1.0	0.2
Distance to nearest Recreation Lake of 5000 acres or more		
10 miles or less	18.0	20.1
11 to 25 miles	20.1	22.1
26 - 50 miles	54.0	57.1
over 50 miles	7.9	0.7

*Includes those reservoirs which are authorized or under construction.

population who have lakes really close by does not change a great deal.[1]

With respect to shared opportunities, there are also some important changes (Table 9). As these new water-based facilities are added to the recreation resource base of the State, the proportion of Oklahomans

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[1]Note that these conclusions are based upon 1970 population figures, and are valid only if there is no change in population, or if the assumption can be made that any population change is constant in the same proportion over the whole region. If however, rapid urbanization of the region continues it seems likely that given the distribution of new facilities in the rural areas, that the proportion of popualtion which is well-served by recreational opportunities may, in fact, decline.

TABLE 9. PROPORTION OF OKLAHOMA'S POPULATION POSSESSING VARIOUS LEVELS OF SHARED OPPORTUNITIES OF WATER SURFACE ACREAGE: PRESENT AND FUTURE

	Present	Future
Assuming a 50 Mile Driving Range Surface Acreage per 1000 persons		
less than 10 Acres	30.9%	24.6%
11 to 20 acres	28.2	28.7
21 to 50 acres	13.2	11.6
Over 50 acres	27.7	35.0
Assuming a 75 Mile Driving Range		
Less than 10 acres	10.9%	5.8%
11 to 20 acres	24.8	23.9
21 to 50 acres	16.7	13.3
Over 50 acres	47.6	56.9

Future Recreation Lakes include present plus those authorized or under construction.

who enjoy relatively large shares (over fifty acres per 1000 persons) will increase from approximately 28 percent to 35 percent, if we assume a willingness to drive no more than fifty miles to reach such facilities. If the assumed driving range is increased to seventy-five miles, the 48 percent of the population which currently has a relatively large share is increased to include 57 percent of all Oklahomans.

CHAPTER 4

SUMMARY AND CONCLUSIONS

This research has shown that it is possible to develop a highly sensitive population surface which can be extremely useful in the evaluation of opportunities for recreational participation. The surface ignores political boundaries, making it consistent with both observed patterns of recreational behavior, and the service areas of recreational facilities. We have used several different measures of recreational resources to evaluate the availability of regional recreational opportunities to Oklahomans. In addition these measures have been used to display the tremendous geographic variation in opportunities within the State.

The findings suggest that many, if not most, Oklahomans are poorly served by such recreational opportunities. More importantly, where a person lives, to a large extent determines the choices he has with respect to leisure pursuits. His home location is particularly vital in light of the great place-to-place discrepancies in recreation opportunities which characterizes the State. Most urban areas are poorly served, even if we assume some minimal acceptable level of satisfaction. Moreover, the situation is worsened when the real world sharing of facilities is taken into accout. The South, West, and North Central regions of the State are similarly deprived from some, or in some instances all, important recreational resources. In addition it appears that many Oklahomans are better served by facilities outside of their own State, while conversely, many non-Oklahomans are best served by Oklahoma recreational resources.

We believe that this approach provides a preferable alternative to traditional methods of evaluating recreational resources. Regional

inequities in the existing opportunities can be readily identified and incremential development of facilities planned accordingly. Similarly, minimal recreational opportunity standards could be developed and implemented. Programs designed to provide each part of the State with minimal opportunity standards could also be developed. These equity approaches contrast sharply to the widely-used procedure of basing the expansion of recreational facilities upon existing participation patterns, a practice which has a tendency to perpetuate resource distribution inequities. While the standards approach is used in many instances, the standards have usually been developed for arbitrary regions and do not reflect the realities of either population distribution or recreational travel behavior.

With respect to the opportunity approach it should be pointed out that much greater analytical detail is easily obtained. For example, opportunities could be defined in terms of the number of campsites, picnic sites, lodging units, or other recreation facilities. The facilities could be weighted in ways which reflect certain quality criteria. Gross population data could be adjusted to account for age or other socio-economic characteristics which effect differences in propensities to regard specific facilities as opportunities.

We believe that the opportunity approach lends itself to the rapid assessment of the impact of proposed facilities upon recreational opportunities for various regional population groups. For example a number of reservoirs of interest to Oklahomans are currently under construction or are authorized for construction. We utilized several different measures of recreational opportunities to examine the extent to which such additions to the recreational resource base of one state would improve access. While some improvement were noted, it was apparent that the locations of

the new facilities were of little significance to people in most areas of the State. At the micro scale, similar analyses could be undertaken to evaluate a single proposed park or a facility within a park. This would assist planners in the selection of high priority projects from several alternatives, or in the evaluation of the net improvement of opportunities generated by implementation of a statewice development program. Such a procedure can also be used for a section of Oklahoma or at a scale involving several states.

We believe that the techniques for evaluating present and future recreational resources vis a vis current and predicted population distribution in Oklahoma, have a much wider application. Based on our system for assessing existing opportunities and for simulating shared ones, irrespective of political boundaries, it is both possible and highly recommended that a state or other type of political unit, including municipalities, counties, sub-state planning regions, multi-state territories, and even nations stronger consider the boundary crossing travel behavior of the typical recreation seeker.

Thus in the case of Oklahoma, <u>all</u> future planning should be carefully coordinated with surrounding states, and the use of political areas such as counties or sub-state planning regions for recreation planning should be drastically reduced or eliminated. It is perhaps redundant to say that the system which has been developed and applied to Oklahoma can and should be utilized in other states. Furthermore we strongly recommend that all types of public recreational facilities (and private ones too where possible) throughout the United States be examined from such a perspective, and that planning for future recreational increments be based on said examination. For if we are to approach equity in regard

to the right to pursue outdoor leisure, we must abandon the traditional evaluation process and begin to realistically evaluate the worsening plight of most urban-locked Americans.

APPENDIX A

SOME NOTES ON METHODOLOGY

The Grid System

As a preliminary step to the measurement and analysis of recreational opportunities, it was necessary to allocate the population of Oklahoma and surrounding areas to a set of points from which measurements of opportunities could be made. The use of county center points was deemed inadequate because such a procedure produced too few and too widely spaced points, and a data plane that was too generalized for meaningful interpretation. The use of Census County Divisions (U. S. Census of Population) was also rejected because it would have required several thousand data points, which in turn would result in high data processing and mapping costs. Moreover the use of County or Census County Division inputs would produce maps where the Western part of the study region was much more highly generalized than the eastern part, a pattern which promotes some difficulty when it comes to interpretation.

For these reasons it was decided that center points of an arbitrary hexagonal grid system offered a data representation system which was relatively more efficient in terms of generalizing data, measurement, mapping and analysis. Thus a hexagonal grid was superimposed on the study region (Oklahoma and parts of other States within 150 miles of Oklahoma), with the center point of each cell of 500 square miles being 18 miles from all other surrounding points. This produced a geographical matrix of 680 points for the region as a whole. Only the 180 points lying within Oklahoma served as inputs to the mapping routines, although all 680 points were used in some of the measurements and analyses.

Allocation of Population to the Grid

The allocation of population to the system of points was accomplished by manually assigning Census County Division populations. By overlaying the hexagonal grid on the Census maps indicating the Census County Divisions, the Census County Division population could be allocated to the cell in which most of the population appeared to reside. Reference was also made to highway and topographic maps for locating population centers within each Census County Division to help in the allocation procedure. In some cases where Census County Divisions were very large (in the Western part of the study region, for example), populations were split among more than one cell.

Measuring Recreational Opportunities

Recreational opportunities were measured for each of the 680 population centers. Road distances were measured to the nearest access point of a park or reservoir area. Facility frequency counts and acreage figures were measured for several distance zones which were constructed using road mileage.

Criteria Selection

Criteria were selected in light of existing availability of data on recreational facilities and their locations (Figure 1). The first

Figure I

LIST OF CRITERIA USED TO MEASURE RECREATIONAL OPPORTUNITIES

1. Water surface area within 25 miles
2. Water surface area within 50 miles
3. Water surface area within 75 miles

Figure 1 (Continued)

4. Land area associated with water within 25 miles
5. Land area associated with water within 50 miles
6. Land area associated with water within 75 miles

7. Other land areas within 25 miles
8. Other land areas within 50 miles
9. Other land areas within 75 miles

10. Number of reservoirs over 1000 acres within 25 miles
11. Number of reservoirs over 1000 acres within 50 miles
12. Number of reservoirs over 1000 acres within 75 miles

13. Number of recreation areas within 25 miles
14. Number of recreation areas within 50 miles
15. Number of recreation areas within 75 miles

16. Distance to nearest recreation area of 500 acres or larger

17. Distance to nearest water-based recreation area 500 acres or larger

18. Distance to nearest reservoir of 1000 surface areas

19. Distance to nearest reservoir of 5000 surface areas

20. Distance to nearest reservoirs authorized or under construction

21. Percapita share of recreation area 500 acres or larger using a 50 mile travel distance assumption

22. Percapita share of recreation areas 500 acres or larger using a 75 mile travel distance assumption

23. Percapita share of reservoir acreage using a 50 mile travel distance assumption

24. Percapita share of reservoir acreage using a 75 mile travel distance assumption

type of opportunity utilizes measurement of the number of facilities within selected distance zones. From the center point of each cell the number of facilities, (regional recreational facilities, water-based recreation areas, reservoirs of various sizes) were recorded within highway distance zones of twenty-five, fifty, and seventy-five miles.

It was reasoned that this type of measure provides an accurate indication of the range of recreational opportunities available at a given point. A similar procedure was used to encode acreage data for specific types of facilities. Acreage within given distance zones was used as an indicator of the extent of recreational opportunities within a given distance.

A second type of criterion emphasizes distance to the nearest facility of a given type. It simply describes the minimum distance that persons at a given place would have to travel in order to reach a facility of a certain type, or size. This approach offers a refinement of the first type of criterion in that it provides more detail regarding minimal conditions of accessibility to a given type of facility.

The first two types of criteria may appropriately be regarded as "equity" variables (each point was treated as all other points, regardless of population size). This approach was justified on the assumption that all persons might reasonably be expected to possess opportunities of at least a minimal sort regardless of the number of people at the same or nearby locations. However, it is intuitively clear that 10,000 acres of regional park land in a densely settled urban region represents a relatively lesser opportunity to a given person living in a sparsely settled region. Moreover, people in a small community near a park may be sharing this facility with a large metropolitan area many miles away. A third type of criterion was developed to describe the individual and his community's share in regional opportunities.

In order to measure such a share, it is tempting to merely divide the population in a community or a region into the total

regional recreation resources within a certain distance. Yet it is easily shown that such a practice ignores the realities of the distribution of population, recreational facilities, and the market areas for recreational facilities (Figure 2). Thus City A does have recreation area #1 within its day use hinterland and it does not share that area with another population center. However, recreation area #2 which also represents a recreational opportunity for people at city A, must also be shared with city B. Moreover, city B's population has access to recreation area #3 so that a portion of city B's population is diverted from recreation area #2 thereby increasing that area's capacity to serve city A.

For each population center a value was obtained as follows:

1. driving range (market area) was specified; fifty and seventy five miles were used;
2. the total population within the driving range (market area) of each recreation facility was obtained;
3. the acreage of the facility was divided by the population in that market area or distance zone;
4. the percapita share of that facility was assigned to the population points within the facility's market area;
5. the preceding procedures were repeated for each recreation area of a given type;
6. at each population center, the percapita shares of each facility within a specified driving range were summed, yielding an individual's share of a given type of regional recreation acreage;

7. a community or population center's (point) share of regional recreation acreage was calculated by multiplying the population of that point by the summed percapita shares.

Professor Stephen W. Tweedie developed a computer algorithm to accomplish the above (Figure 3).

Additional Computer Program Growing Out of this Research

As work progressed, it became apparent that most of the measurements which were made manually, could readily be done automatically. At the present time a master program, developed with the assistance of Professor Tweedie, is nearing completion, and it appears to have the potential of reducing data handling and processing problems considerably. It is designed also to provide automatic allocation of coordinatize census county division population data into any pre-selected grid system. Inputs to this program are coordinatized data for the distribution of population as well as the distribution of facilities. Many measures of opportunities can be rapidly evaluated for as many points as necessary. The program can objectively identify both population centers that are poorly served by existing recreation facilities, and to assess recreation sites which are currently inadequate for present demands. The user is free to test various assumptions about participation rates and site capacities for different types of facilities or different activities. In addition, recreational "demand" can be treated either as invarient within a given distance, or inversely related to distance. Proposed recreation sites can be entered to assess their probable impact on the system. Outputs from the program can be readily mapped using existing computer mapping routines.

APPENDIX B

NEAR-CAPACITY, CAPACITY, AND OVER-CAPACITY USAGE OF RECREATIONAL FACILITIES: IMPLICATIONS FOR PLANNING*

Much has been written about the use of recreation areas at near capacity, capacity, and over-capacity levels. A good deal of this work has been done in connection with the management considerations of carrying capacity, both from the standpoint of the preservation of recreational resources, and the psychological standpoint of the visitors (Stankey and Lime, 1973). Thus, the effect of increased use on sites, equipment, vegetation, erosion, and water quality is well known. And there is considerable knowledge about the relationship between crowdedness and user satisfaction.

Some use of capacity analysis has occured in the assessment or justification of facility needs in light of existing or expected patterns of participation (Oklahoma SCORP). This type of analysis considers the extent to which existing facilities can accomodate present or projected participation levels. Yet in spite of the obvious planning implications little effort has been made to determine just what portion of existing facility capacity is actually used.

There are several reasons why such efforts are lacking. First, rather than a single absolute capacity, each facility has a whole range of potential capacities, each providing different consequences. Capacity is determined by the character of use that a facility has been developed to support over a specified time. By changing the characters of use and the level of development, the capacity of the facility is also

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*Al Zapata, research assistant was the major contributor of this section.

changed (Line and Stankey, 1971). Second, while most general definitions of capacity point out that a satisfactory experience for the user and minimal damage to the resource are important capacity considerations, these qualities are difficult to measure because they involve value judgements (Wagar, 1974). Finally, data required for such analysis are not readily obtained.

It seems quite reasonable that measurements of existing use in relationship to some criteria of capacity could serve as an important aid in determining needs for additional facilities. Determinations of facility surplus, sufficiency, or deficiency with respect to usage than could be effectively used in conjunction with proposals for changes to the recreational resource base in an area.

This study explores two approaches regarding the assessment of relationships between existing usage and capacities for some recreational facilities in Oklahoma. The work continues with an evaluation of each approach, and concludes with a critique of existing methods of data collection for that State's recreation facilities.

The Measurement of Finite Capacity

Finite or absolute capacity can be evaluated only if it can be assumed that a facility being used at any given point in time can only accomodate a specified maximum number of people or groups. It is then possible to determine whether facilities are totally used or what portion of them is in use. Such measurements are easy to make in the case of rented cabins or cottages, boat rentals, and campsites, for it is a rather simple matter to determine how many facilities are available, and to determine what proportion of them are being used at any point in time.

Information of this type is available for Oklahoma State Lodges and State Park Cabins, because registration is required and fees must be paid. Daily occupancy reports are routinely reported to a central location. For purposes of this report, measurements were made of full (100%) capacity and near-capacity (ninety percent or more).

All cabins and lodges experienced usage at near or full capacity during 1973. In terms of total annual capacity, lodges and cabins usage appears to be low. At no locations were the facilities fully occupied even so much as twenty-five percent of the nights during that year, nor were they nearly full even so much as thirty percent of the time (Table 1).

TABLE 1

PERCENTAGE OF NIGHTS ALL LODGING UNITS WERE RENTED

Facility	Near Capacity	Capacity
Fountainhead	13%	6%
Arrowhead	7	3
Texoma	12	4
Western Hills	7	2
Lake Murray	12	9
Quartz Mountain	3	3
Roman Nose	4	4
Boiling Springs*		24
Great Salt Plains*		15
Robbers Cave	10	1
Keystone	2	3
Lake Wister	5	13
Osage Hills*		15
Greenleaf	7	20
Beavers Bend	26	5
Tenkiller	19	10

*These facilities have fewer than 10 units so that if full occupancy is not reached, then occupancy is less than 90%.

In the case of State lodging facilities, there is, of course, a highly seasonal use configuration which is common to most recreation facilities. Even so, occupancy levels in peak periods are nowhere near maximum. In the summer months of 1973, only a few facilities were fully occupied for more than one in three nights. Only three facilities had occupancy levels of 90 percent or more on as much as two-thirds of the nights (Table 2).

TABLE 2

PROPORTION OF PEAK NIGHTS LODGING UNITS WERE EITHER COMPLETELY OR NEARLY ALL OCCUPIED

Facility	Near Capacity	Capacity
Fountainhead	37%	20%
Arrowhead	21	12
Texoma	34	13
Western Hills	14	4
Lake Murray	34	25
Quartz Mountain	9	10
Roman Nose	8	8
Boiling Springs*		52
Great Salt Plains*		24
Robbers Cave	22	3
Keystone	3	7
Lake Wister	15	30
Osage Hills*		33
Greenleaf	16	60
Beavers Bend	60	13
Tenkiller	52	30

*These facilities have fewer than 10 units so that if full occupancy is not reached, then occupancy is less than 90%.

If consideration is given only to weekends during this period, just six of the sixteen facilities were fully occupied more than half of the time. However, all facilities reached occupancy levels of 90% or more

on at least sixty percent of the weekend nights. Several facilities had near or full occupancy 85% or more of the weekend nights (Table 3).

TABLE 3

PROPORTION OF WEEKEND NIGHTS THAT LODGING FACILITIES WERE EITHER COMPLETELY OR NEARLY ALL OCCUPIED

Facility	Near Capacity	Capacity
Fountainhead	71%	10%
Arrowhead	20	75
Texoma	35	70
Western Hills	81	15
Lake Murray	5	73
Quartz Mountain	20	41
Roman Nose	35	24
Boiling Springs*		65
Great Salt Plains*		71
Robbers Cave	31	30
Keystone	42	20
Lake Wister	51	23
Osage Hills*		63
Greenleaf	16	44
Beavers Bend	30	31
Tenkiller	40	30

*These facilities have fewer than 10 units so that if full occupancy is not reached, then occupancy is less than 90%.

There is an interesting geographical dimension to this measure of capacity in Oklahoma. The facilities used to near or full capacity most often were found in the extremities of the State, particularly in the eastern and far-western parts. The facilities closer to large do not do as well in this respect. It is also of interest that proximity to neighboring facilities does not seem to reduce the frequency of full or near capacity use; rather the opposite case is generally observed.

Measurement of Relative Capacity

Some types of facilities do not lend themselves to finite measurements of capacity. The number of people who can use a given beach can not be absolutely determined; beach capacity is quite elastic and limits, if any, tend to be defined by ecological damage or psychological criteria. Yet outside of fairly limited research settings, such limits are difficult, if not impossible, to precisely determine.

One commonly-used approach is to employ capacity standards which describe the number of activity occasions that a specified facility-type or area can support in a given length of time - usually a day, month, or year. Typically such a measure is developed for a recreation area by multiplying the number of facility units (a picnic table, acre of beach, acre of camping area, a square foot of water surface) by the average unit capacity and the daily turnover rate (the frequency with which a facility is reoccupied.) Thus an area may be a twelve facility unit, each unit with a capacity of three, with a daily turnover rate of three for a daily capacity standard of 108 activity occasions per day. Note that the unit capacities and the daily turnover rates are obtained empiracally, and daily capacity standards are often aggregated to provide monthly or even annual capacity standards.

Capacity standards are frequently used in conjunction with existing or anticipated participation figures to assess the adequacy of existing facilities and to justify the need for new facilities. Here the daily capacity standard approach is used to examine the relationship of actual usage and facility capacity. Note that in this approach to the consideration of capacity, it is possible to obtain examples of over-capacity usage of facilities.

In Oklahoma it is not possible to obtain daily estimates of participants at State facilities for most recreational activities. For certain activities, monthly participation estimates are maintained. For purposes of this research, monthly visitation figures for picnicking and camping were divided by thirty in order to approximate daily usage. Daily capacity standards used are those developed and explained in the Oklahoma SCORP, and were converted to monthly capacity standards by multiplying by thirty. Data on numbers of facility units were obtained from the Oklahoma Division of State Parks.

Monthly conditions of near capacity, capacity , or over capacity usage of camping or picnicking occurred at only fifteen of the 56 State recreation areas. As might be expected, such conditions are primarily limited to peak season months of May, June, July, and August. At certain areas there is near capacity usage.

CAMPING

State Park	No. of Facilities	Percentages											
		J	F	M	A	M	J	J	A	S	O	N	D
Alabaster Caversn	15						33						
Arrowhead	60							18					
Beavers Bend	90				96	113	122	123	100	91			
Black Mesa	15							5					
Boiling Springs	66							32					
Fort Cobb	80					100	108	112		92			
Foss	30					100	107	112	120	100			
Fountainhead	15					108	112	100	120				
Great Salt Plains	16							78					
Greenleaf	59							37					
Clem-Hamilton	15							19					
Keystone	40							62					
Lake Murray	158							65					
Little River	60							79					
Osage Hills	30						78						
Quartz Mountain	150							23					
Red Rock	65						47						
Robbers Cave	35						116	100	109				
Roman Nose	15								73				
Seqouyah	219								22				
Tenkiller	107						103	104	100				
Texoma	147							69					
Walnut Creek	30								78				
White Eagle	15						20						
Will Rogers	15							30					
Lake Wister	33						77						
Rocky Fond	15							16					

TRAILER CAMPING

Recreation Area	No. of Facilities	Percentages											
		J	F	M	A	M	J	J	A	S	O	N	D
Adair	12					14							
Bernice	12							13					
Boggy Depot	12								1				
Cherokee Disney	58								58				
Clayton Lake	12							11					
Disney	12							10					
Feyodi Creek	24							77					
Heyburn Lake	12							9					
Honey Creek	43									58			
Little Sahara	30							90					
Okmulgee Lake	30						10						
Raymond Gary	12						41						
Salina	12						10						
Sallisaw	12						12						
Sequoyah Bay	16						37						
Snowdale	12							100					
Spavinaw	12					50							
Twin Bridges	60								38				
Upper Spavinaw	12							10					

PICNICKING

State Park	No. of Facilities	Percentage											
		J	F	M	A	M	J	J	A	S	O	N	D
Alabaster Caverns	46					50							
Arrowhead	306									6			
Beavers Bend	429						105	100					
Black Mesa	35									4			
Boiling Springs	66					97	107	100					
Fort Cobb	360							13					
Foss	244							55					
Fountainhead	210					115	100						
Greenleaf	166						40						
Clem-Hamilton	20								31				
Keystone	123						100	102	88				
Lake Murray	237				87	130	100	87	135	87			
Little River	606						108	91	141				
Osage Hills	126						28						
Quartz Mountain	260							28					
Red Rock	50							6					
Robbers Cave	162						90						
Roman Nose	220								3				
Sequoyah	545						12						
Tenkiller	409					63							
Texoma	461							2					
Walnut Creek	177							36					
White Eagle	65							5					
Will Rogers	38							70					
Lake Wister	177						19						
Rocky Ford	50							15					

PICNICKING

Recreation Area	No. of Facilities	Percentage											
		J	F	M	A	M	J	J	A	S	O	N	D
Adair	20						100	92					
Bernice	20							12					
Boggy Depot	156					9							
Cherokee Disney	262						2						
Clayton Lake	120						7						
Disney	20							15					
Feyodi Creek	81							25					
Heyburn Lake	84							100					
Honey Creek	136							12					
Little Sahara	70					78							
Okmulgee Lake	120						38						
Raymond Gary	94						29						
Salina	45												21
Sallisaw	25						55						
Sequoyah	175								38				
Snowdale	50							22					
Spavinaw	75							25					
Twin Bridges	249						5						
Upper Spavinaw	125							14					

As noted previously, the way in which data are maintained required that monthly capacity standards be derived by multiplying daily capacity standards by thirty. This results in a rather more restricted view of capacity conditions.

Some Data Problems

It is believed that analysis of the type described here can be used to some advantage in analyzing facility needs in general or in justifying the development of specific facilities. Yet, there are some serious data drawbacks. One is that reliable data are not routinely available on current usage of most types of recreational facilities. Data are collected by park personnel, and only crude estimation procedures are employed. Moreover, it is believed that there is some tendancy on the part of park personnel to make estimates which are somewhat exaggerated in an effort to justify their own existence, enlarge their budget, or serve their ego. Finally, when submitted to the State Parks Division data which are initially collected on a daily basis are collapsed into monthly summaries thereby rendering them considerably less useful in a detailed analysis of capacity.

On the other hand, in those cases where money is handled, as in the case of lodge and cabin rentals, the data picture is considerably better.

One final note on data; it was not possible to obtain complete information on developed acreage at the different parks, let alone acreage devoted to various activities. Such data could allow the development of procedures whereby capacity standards could be developed on a park by park basis, and usage with respect to capacity could be routinely maintained.

Policy and Planning Implications

If usage of facilities to near, full, and over capacity at certain locations continues at the same level as occurred in 1973, one can expect that deterioration of the physical resources will occur, and the quality of the recreational experience will be threatened at those locations. In order to maintain a high quality experience and resource, consideration must be given to methods of stabilizing or reducing use pressures.

Peaking appears to be the greatest problem of facility use. This study sought to identify those locations where facilities were used to high levels during 1973, with special emphasis on when and where peak usage of facilities occurred. It appears that two general approaches can be employed to solve the problem of peaking: regulation or modification of visitor behavior, or development of additional facilities.

Thus, one approach is to attempt to control or modify visitor behavior in such a way as to discourage peak usage and encourage off-peak use. Examples of this approach include:

- closing facilities when certain use levels are reached;
- allow entry at only certain times of day, allowing exit anytime;
- charge fees, or in cases where fees already exist, develop a more restrictive rate schedule during peak periods.

Generally speaking such methods are met with considerable political resistence.

Another approach is to attempt to spread use more generally through the system. As noted earlier, most facilities are not used to capacity. Methods to spread use more evenly include:

- improvements to facilities in less crowded (less desirable) areas;

- improve the flow of information about crowding (perhaps a toll free phone number could be used to provide potential visitors with current information about which facilities are least crowded);

- develop advertising campaigns directed at encouragement of less used facilities;

- improve access to, or directions to less used facilities

The final approach is to expand facilities. Capacity can be increased at crowded or overused facilities by developing new areas within existing parks - more picnic areas, beaches, campsites, and the like. It is also possible to develop new areas in regions where demand is heaviest.

It is believed that this research not only focuses attention on trouble spots with respect to usage of recreation facilities, but it can also serve to justify and pinpoint the areas where new facilities are needed.

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APPENDIX C

A STUDY OF DEMAND AND OPPORTUNITY RELATIONSHIPS IN OKLAHOMA*

Most research concerning recreation participation levels emphasizes the role which socio-economic variables play in influencing recreation participation.[1] Yet, recent research has cast some doubt on the relationship between recreational participation and occupation.[2] Some have argued[3] and others have shown that the availability of opportunities is of great importance.[4]

This study seeks to advance the latter motion. Specifically, the research described herein examines a single occupation group, professionals, in order to determine the extent to which recreational participation varies with opportunity when a major socio-economic characteristic is held constant.

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[1]See for example, Clarke, A. C. 1956. "Use of Leisure and Its Relation to Levels of Occupational Prestige". American Sociological Review, 21 (1956): 301-307; Dowell, I. J. 1967. "Recreational Pursuits of Selected Occupational Groups". Research Quarterly, 38 (1967): 719-722; Kaplan, M. 1960. "The Use of Leisure". In Handbook of Social Gerontology. C. Tibbens, ed. Chicago, University of Chicago Press. Pp. 407-443; White, R. C. 1955. "Social Class Differences in the Use of Leisure." American Journal of Sociology, 61 (1955): 145-150.

[2]Cunningham, David A., Henry J. Montoye, Helen L. Metzne, and Jacob B. Keller. "Active Leisure Activities as Related to Occupation." Journal of Leisure Research, Vol. II, Spring '70, No. 2. Pp. 104-111.

[3]Knetsch, Jack L. "Assessing the Demand for Outdoor Recreation". Journal of Leisure Research. Vol. I, Winter 1969, No. 1.

[4]Kalter, Robert J. and Lois E. Gosse. "Recreation Demand Functions and Identification Problem". Journal of Leisure Research. Vol. II, Winter 1970, No. 1. Pp. 43-53; Wennergren, E. Boyd and Herbert H. Fullerton. "Estimating Quality and Location Values of Recreational Resources". Journal of Leisure Research, Vol. IV, Summer 1972, No. 3. Pp. 170-183.

*Vince Robinson, research assistant was the major contributor of this section.

Methodology

Twenty sample cities were chosen on the basis of their access to recreational opportunities (Table I). Two types of measures of recreational opportunity were used in the sample - city selection process - one relates to the proximity to opportunity and the other the extent of opportunity. Thus, distance to the nearest major recreation area gives an indication of proximity which the number of facilities within a specified distance provide an estimate of the range of alternative opportunities or extent.

The professionals to be interviewed were selected from their respective sample city telephone directory. Due to the small size of the professional population in some sample cities, it was necessary to contact 90-100% of the professionals. Otherwise, the sample size for those particular cities would have been too small. The interviews were obtained through the use of a mail-back questionnaire.

The data obtained included information on how many and where trips were taken, their length, the character of the recreation group and what activities were pursued during the past year (Figure I).

WATER RESOURCES INSTITUTE RECREATION AREA USE SURVEY				ACTIVITIES IN WHICH MEMBERS OF THE PARTY USUALLY PARTICIPATE							
NAMES OF RECREATION AREAS VISITED IN THE PAST TWELVE MONTHS	NUMBER OF VISITS	NUMBER OF DAYS	AGES OF FAMILY MEMBERS WHO USUALLY GO	FISHING	BOATING	SWIMMING	WATER SKIING	PICKNICKING	CAMPING	HIKING	GOLF GAMES

TABLE I

OPPORTUNITY CHARACTERISTICS

Sample City	Total Number of Recreation Areas Within		Distance to the Nearest Water-Based Recreation Area of 500 Acres or More
	25 Miles	50 Miles	
Altus	1	1	15
Ardmore	2	8	12
Bartlesville	2	12	13
Elk City	1	1	12
Enid	1	3	24
Guymon	0	0	66
Idabel	1	5	27
Lawton	0	6	35
McAlester	1	6	19
Miami	1	10	55
Muskogee	6	16	12
Oklahoma City	0	1	28
Ponca City	1	7	48
Poteau	2	8	1
Sapulpa	4	8	6
Shawnee	2	2	22
Stillwater	1	6	41
Tahlequah	7	16	7
Tulsa	1	12	28
Woodward	3	3	20

Data were assembled in contingency table form, examined, and then tested for statistical significance.

The Professionals: General Observations

As indicated previously, it was a general hypothesis of this study that among a single socio-economic group, opportunities were of major importance in determining recreation behavior. The sample of 69 contained 23.2% physicians, 24.5% attorneys, and 52.3% other professionals, including CPA's, geologists, and dentists. Response levels were normal for mail-out surveys, about 28%, and non-respondents were distributed more or less regularly among the sample cities (Table II).

Eighty-four percent of the trips taken were in connection with water-based recreation activities. The most frequent group type was the family group. Of course, the patterns of destinations and distances traveled to recreation facilities varied considerably among the respondents, as did the level of participation. The principle destinations (favorite or most frequently visited destination) were more or less specific to the sample cities, and quite repetitive within each city (Table III).

The Professionals: Opportunity and Participation

Response frequencies were analyzed in a contingency table form. The variables below were categorized and plotted against each of the opportunity categories:

1) The number of participants and non-participants;
2) Total number of visits per respondent;
3) The number of respondents and non-respondents;

TABLE II

GENERAL CHARACTERISTICS OF THE SAMPLE

Sample City	# of Questionnaire Sent Out	# Returned	# Returned With "NONE"* Response	% Returned	% "NONE"* Response of Total Responses
Elk City	23	5	2	22	40
Oklahoma City	36	11	2	31	18
Ardmore	41	13	3	32	23
Altus	36	12	0	33	0
Sapulpa	26	9	2	35	22
Ponca City	47	11	3	23	27
Guymon	29	11	4	38	36
Woodward	30	7	0	23	0
Muskogee	48	12	2	25	16
Idabel	14	7	0	50	0
Miami	24	6	0	25	0
McAlester	36	8	1	22	13
Lawton	48	10	1	21	10
Poteau	18	2	0	11	0
Shawnee	43	13	1	30	8
Tahlequah	20	8	1	40	13
Stillwater	42	14	4	33	29
Bartlesville	44	12	2	27	16
Enid	44	15	3	34	20
Tulsa	42	8	1	19	13
TOTAL	691	194	32	28	16

* NONE category is the category in which the response on the questionnarie indicated non-participation. Most respondents in this category merely wrote none.

TABLE III

GENERAL DESTINATION PATTERNS FOR SAMPLE CITIES

Sample City	Principle Destination	Number of Water-Related Recreation Visits (TOTAL)	Average # of Water-Related Trips Per Participant
Altus	Altus Reservoir	151	12.5
Ardmore	Murray Lake	99	9.9
Bartlesville	Grand Lake	101	10.1
Elk City	Foss Lake	18	6.0
Enid	Canton Lake	112	9.3
Guymon	Out-of-State	6	0.86
Idabel	Broken Bow Lake	111	16.0
Lawton	Wichita Mountains	177	19.7
McAlester	Eufaula Lake	158	22.0
Miami	Grand Lake	153	25.5
Muskogee	Ft. Gibson	143	14.0
Oklahoma City	Fountainhead Lodge	18	2.0

4) Distance (one-way) traveled to principle destination;

5) Mean number of visits per respondent.

The same variables were plotted against the categories of opportunity proximity.

Participation and Proximity

There appears to be substantial differences in participation characteristics under different conditions of access to facilities. While there is some doubt that nearness to a facility has much influence on whether or not professionals participate among participants, the level of participation surely is affected and in an expectable and constant direction (Table IV). For example, slightly over 50% of the respondents

TABLE IV

RESPONSE FREQUENCIES: PARTICIPATION CHARACTERISTICS BY PROXIMITY TO NEAREST WATER-BASED RECREATION AREA OF 500 ACRES OR MORE

Level of Participation

Number of Visits Per Respondent	Proximity in Miles 0-12	13-25	26+
NONE	10	7	15
1-9	14	27	35
10+	25	41	19

Mean Level of Participation
($\bar{x}$ number visits per participant)

	Proximity in Miles 0-12	13-25	26+
1-5	20	42	41
6-10	10	11	3
10+	8	15	10

$x^2 = 8.6$
DF = 4 Significance level = .1

who live within 12 miles of a recreation area (water-based and 500 acres or more) made over ten trips per year. In contrast, of those who live over 25 miles from the nearest recreation area, 50% did not make 10 or more trips per year. In addition 21% of the respondents within that category responded with a "NONE". Therefore, the indications are that the nearer to a facility professionals are the higher the level of participation. There is a slight indication it may also affect the proportion which participate, though this latter point is inconclusive!

Participation and Extent of Opportunity

Not only are there positive relationships between participation and proximity, but there are also some, though perhaps, weaker relationships between the extent of opportunities and participation characteristics of the professional sample (Table 5).

When there are five or more recreation areas within 25 miles of a sample population, 65% of the respondents in that category made ten or more trips a year. At the opposite end of the scale where the extent of opportunities within 25 miles is zero, about 50% of the respondents within that category made under 10 trips a year.

Approximately 25% of those in the zero opportunity category responded with "NONE". Thus, hinting that the range of opportunities might have something to do with the number that participates. Yet, as in the case of proximity, the evidence here is inconclusive.

In relation to the significance levels obtained through the chi-square tests, the proximity variable appears to be the stronger of the two. Yet, both are important influences.

TABLE V

RESPONSE FREQUENCIES: PARTICIPATION CHARACTERISTICS BY EXTENT OF OPPORTUNITY

Number of Recreation Areas Within 25 Miles

Levels of Participation (number of visits per respondent)

	0	1	2-4	5+
NONE	7	14	8	3
1-9	16	34	19	4
10+	8	38	26	13

$x^2 = 10.4$
DF = 6

Significance level = 0.2

Number of Recreation Areas Within 50 Miles

Levels of Participation (Number of visits per respondent)

	0-2	3-5	6-9	10+
NONE	9	3	14	6
1-9	28	9	25	13
10+	15	17	28	26

$x^2 = 12.7$
DF = 6

Significance level = .05

Mean Level of Participation ($\bar{x}$ # of visits per participant)

	0	1	2-4	5+
1-5	20	44	32	7
6-10	0	11	6	6
10+	4	17	10	4

$x^2 = 15.2$
DF = 6

Significance level = 0.02

Mean Level of Participation ($\bar{x}$ # of visits per participant)

	0-2	3-5	6-9	10+
1-5	32	15	36	20
6-10	5	4	6	8
10+	6	7	11	11

$x^2 = 6$
DF = 6

Significanct level = (not significant)

Summary and Conclusion

When a sample of the population is drawn from a single socio-economic level, recreational opportunities appear to play an important role in determining some characteristics of participation in water-oriented outdoor recreation activities. As proximity to facilities providing water-based recreation is increased, participation levels among professional occupation households are increased. As the number or extent of nearby facilities is increased, there is an associated increase in participation levels for this occupation group. There is no reason to believe that such relationships hold regardless of socio-economic level.

It is the author's belief that these findings lend considerable support to the notion that increasing or improving water-based recreational opportunities will serve to increase demand. The use of past or present participation levels to predict demand, to estimate benefits, or estimate the need for recreational facilities is therefore a questionable practice.

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AN ANALYSIS OF THE UTILITY OF SUB STATE PLANNING REGIONS FOR RECREATION PLANNING*

Substate Planning Regions are a relatively recent addition to the organization of state governments. Only during the past ten years have they been established on a widespread basis, although some states had a form of substate districting as early as 1958. (Advisory Commission on Intergovernmental Relations, 1973, p. 226)[1]

It appears that in many cases the SSPRs were founded on the premise that a unit smaller than the state, but larger than a municipality or county was needed as a planning unit. There is a general tendency to assume that these SSPRs represent people and regions with similar characteristics and interests. It is also felt that this assumed representation makes these regions functional. This last assumption presents a special problem because most SSPRs are oriented toward pre-existing political boundaries which do not necessarily reflect the functional organization of space at the present time.

There is some degree of variance from state to state in the purpose of Substate Planning Regions. In some cases they simply represent a common set of boundaries to be used while carrying out a variety of Federal, State, and local programs. Yet, some states place considerable emphasis on these regions utilizing them in reorganization of state operations. There are still others who combine these objectives

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[1]For an in-depth review of the evolution of Substate Planning Regions see: Advisory Commission on Intergovernmental Relations, Regional Decision Making: New Strategies for Substate Districts, Vol. 1, (1973), and Bureau of the Budget, "Coordination of Development Planning for Programs Based on Multi-Jurisdictional Areas," Circular A-80, January 31, 1967.

*Mike Russell, research assistant was the major contributor of this section.

by giving a locally controlled regional organization the responsibility of coordinating many Federal, State, and local programs. In most cases, however, they were designed to bring simplicity, understanding, and coordination to an area which previously had been governed by a highly intricate web of boundaries and competing organizations.

Substate Planning Regions are used by State agencies for many planning purposes, most of which allegedly pertain to the homogeneous social and economic traits of the member counties and municipalities. The SSPRs are used as a basis for regionally oriented plans and decisions concerning wide ranging issues such as health care, economic development, law enforcement, and recreation.

In Oklahoma the Substate Planning Regions are used as a unit for recreation planning. The State Comprehensive Outdoor Recreation Plan (SCORP) uses the regions as the basic areal unit in its measurement, prediction, and forecasting. For each SSPR planners must determine the present patterns of use as well as the amount and quality of present facilities. Historical growth models are utilized to predict user participation rates and planners must attempt to forecast future levels of supply and demand of recreation facilities for each region.

In April, 1966, in response to an invitation by the Economic Development Administration, the Kiamichi Economic Development District, in the southeastern part of the state, was established as the first substate region in Oklahoma. Between 1966 and 1969, eight substate districts were established while the final three were designated in 1971. In many cases, the Substate Planning Regions of Oklahoma were based on economic development districts or councils of government

regions.[2] The Substate Planning Regions in Oklahoma were established by use of the Interlocal Cooperation Act of 1965. (Cimarron Data Services Ltd., 1972, p. 1) In May, 1971, an executive order officially established the Substate Planning Regions.

It is the purpose of the Oklahoma Substate Planning Regions:

1. To foster citizen participation in identifying, planning for, and implementing goals, objectives, and programs;
2. To assist in improving communications between citizens, and local and state governments;
3. To serve as a mechanism for improving state and federal responsiveness to local needs;
4. To undertake programs and activities which make government more effective;
5. To provide information about District issues and their possible impact on local governments;
6. To serve as a coordination point for processing federal grant applications for local units of government within the district;
7. To serve as a district clearinghouse for OMB Circular A-95 operations as specified and in concurrence with the State Clearinghouse;
8. To serve as a focal point for dissemination of technical information available from state and federal agencies;

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[2]The Economic Development Districts which were used as a bisis for Substate Planning Regions in Oklahoma were: Northeast Counties of Oklahoma Development District (NECO), Eastern Oklahoma Economic Development District (EOEDD), Kiamichi Economic Development District of Oklahoma (KEDDO), Central Oklahoma Economic Development District (COEDD), and Southern Oklahoma Development Association (SODA).

9. To serve as a mechanism for local units of government to obtain state and federal assistance in technical, administrative, and financial areas;
10. To serve as the coordination office for integrating comprehensive planning efforts into a district plan and assisting the Office of Community Affairs and Planning in integrating these plans into the State Planning function;
11. To coordinate the planning efforts in the following areas:
    a. Law Enforcement
    b. Health Planning
    c. Community Development
    d. Economic Development
    e. Manpower Planning
    f. Other specific areas as directed by the Office of Community Affairs and Planning

It appears that the Substate Planning Regions are used as an intermediate level in the governmental hierarchy. It was originally thought that through the SSPRs an efficient promotion and implementation of the State Comprehensive Outdoor Recreation Plan would be realized. It also was expected that the establishment of this level of bureaucracy would allow some degree of efficiency in the coordination of the planning effort. However, the initial SCORP mentioned that the regions should be centered on a recreation site and enclosed by political boundaries. The political boundaries do not realistically reflect the functional recreation areas.

In an attempt to realize this anticipated efficiency and also in response to prodding by the Bureau of Outdoor Recreation, the State of

Oklahoma established recreation planning objectives in conjunction with its comprehensive plan. (Breish Engineering Company, Murray, Jones, and Murray, Community Planning Associates, 1966, p. i) SCORP and the planning objectives included in it were expected to:

1. Provide a basis for correlation and coordination with nation-wide recreation planning;
2. Provide a basis for developing a long-range plan for the acquisition and development of those areas necessary for an overall system of outdoor recreational areas and facilities which:
   a. Contribute to the recreation, education, health, and well-being of the State and visitors to the State.
   b. Utilize the State's unique geography, mild weather, and diverse physical features.
3. Provide guidelines for intelligent decisions by public and private investors in outdoor recreation;
4. Provide a guide for priority of acquisition and development of State recreation programs;
5. Provide an efficient, functional, and organizational framework under existing legislation;
6. Provide the preliminary framework for analyzing requests for funds submitted to the Bureau of Outdoor Recreation, under the 1965 Land and Water Conservation Fund Program, and from the Housing and Home Finance Agency, under the 1961 Housing Act, (Title VII), for open space acquisitions.

In 1969, when the Industrial Development and Parks Commission established the boundaries for the Substate Planning Regions, they

used the county as the basis for demarcation. The Commission pointed out that consistency with existing organizational regions was necessary. These included, but were not limited to, Economic Development Districts, Councils of Government, Standard Metropolitan Statistical Areas, Natural Boundaries, and Political Boundaries. (Oklahoma Industrial Development and Parks Commission, 1969, p. 5) However, because each of these organizational regions encompasses a distinct political, economical, or social area, it is not possible for the boundaries to coincide. That is, Economic Development Districts were based on economic characteristics, therefore, recreation regions should be based on recreation sites and their functional areas. Because each of these regions are based on completely unrelated characteristics, it is not possible for their boundaries to be consistent as the Commission suggested.

This exemplifies the contradictory methods used by many agencies for demarcation purposes. The Advisory Commission on Intergovernmental Relations conducted a study of twelve states which have substate districts and this contradiction was also evident in their findings.

> Regardless of the basic approach followed by any of the twelve states studied, the delineation of boundaries always seemed to consist of a combination of economic, political, geographic, and demographic criteria...In all cases, county boundaries were followed so no county was divided...Geographic factors were important, too, because of the effect of natural obstacles such as mountain ranges or excessive distance. (Advisory Commission on Intergovernmental Relations, 1973, p. 237)

This contradiction is evident in many areas where regional planning districts are used. This occurs because the boundaries do not take all regional characteristics into account, nor do they compliment the objectives of the planning effort.

In the case of recreation planning, a different type of disaggregation of the state is needed to yield efficient recreation planning.

Kuklinski appreciates the problem of regional demarcation when he notes:

> The special difficulty in finding the optimal delineation is explained by the fact that the demand of regional disaggregation of national plans and the demand of regional aggregation of local plans are leading not to one integrated delineation but to two separate regional divisions. In simpler terms it can be said that for the regional disaggregation of national (state) plans a country (state) should be divided into a small number of big regions. In contrast to this, for the regional aggregation of local plans, a much larger number of smaller regions is needed. (Kuklinsky, 1970, p. 269-278)

Goals, though, are not the only factor which should dictate the size, number, and demarcation of the regions. As Zimmerman notes, it also depends, to a great extent, on the function of the region and its governing authority:

> An argument in favor of single purpose authorities is that the ideal geographical area may be different for each major function. (Zimmerman, 1972, p. 286-290)

In this manner the recreation planning regions would be distinctive and different from the regions used for health planning, economic development, or manpower planning. The boundaries of a given region could be based on the geographic and demographic characteristics of that region. For example, the people who customarily use, or are logically centered about, a recreation site, or group of sites, would be assigned to one region. This would produce a situation where boundaries are efficient as a representation of the actual, theoretical, or proposed functioning of the recreation system.

With the increasing awareness of this problem many individuals and agencies have begun efforts to create more satisfactory areal definitions. Berry calls for the organization of regions according to their Functional Economic Areas (FEA). He defines these in terms of a labor market and includes all those counties sending commuters to a given central county, for which the proportion of resident workers commuting to the given central county exceeds the proportion of workers commuting to alternative counties. (Berry, 1967, p. 21)

It certainly appears feasible to adjust this concept to Substate Planning Regions and recreational planning. The location of recreationists could be substituted for the residences of commuters. Those residential areas or population centers having a higher percentage of attendance at a particular facility, or combination of facilities, than at any other facility, or set of facilities, would be included in that Substate Planning Region. In this way the delineation of regions would be based on the attendance figure of the facilities.

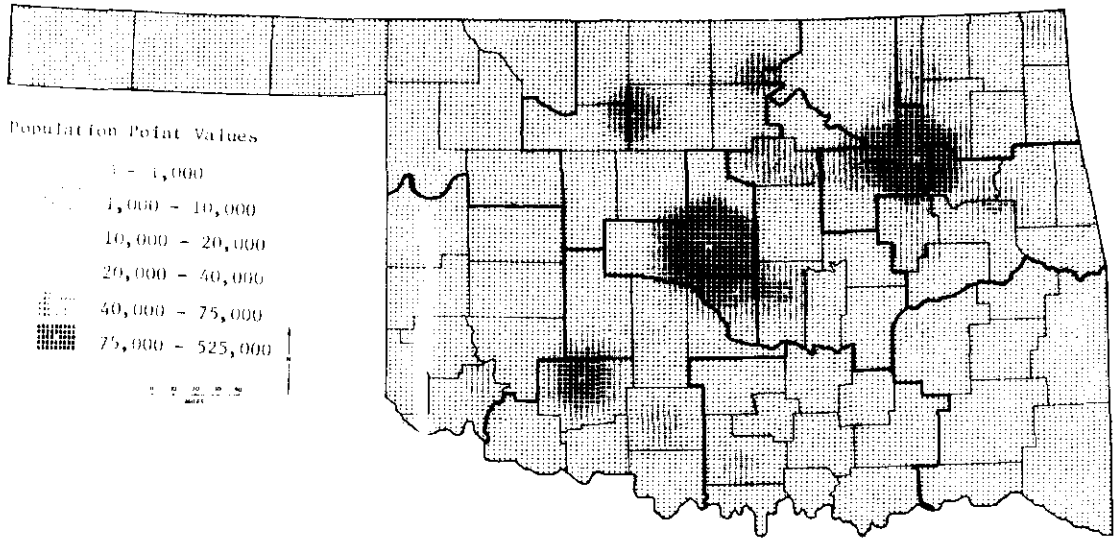
It is the purpose of the regions, in the recreation planning context, to disaggregate the state into regions which facilitate an assessment of recreation facility supply and demand. The policies, programs, and decisions of the regional governments should reflect this areal differentiation of the interaction of supply and demand.

Interaction of supply and demand should make a significant contribution to the process of delimitation of regions. The variation in the amount of demand for goods and services is dependent on the distribution of the population. Any methodology that is used to draw boundaries for regions should consider the actual location of the population clusters. The regionalization process should not divide people

into unnatural groupings. The population distribution in Oklahoma (Figure 1) shows that in many cases the Substate Planning Regions divide concentrations of people into different regions. This distribution represents a demand surface. There are two prime areas where population centers cross the boundaries of Substate Planning Regions. Shawnee and central Pottawatomie County are becoming an extension of Oklahoma City to the east and southeast. These areas are parts of the Oklahoma City metropolitan area, yet they are in a different planning region.

Figure 1

Population Distribution and Substate
Planning District Boundaries



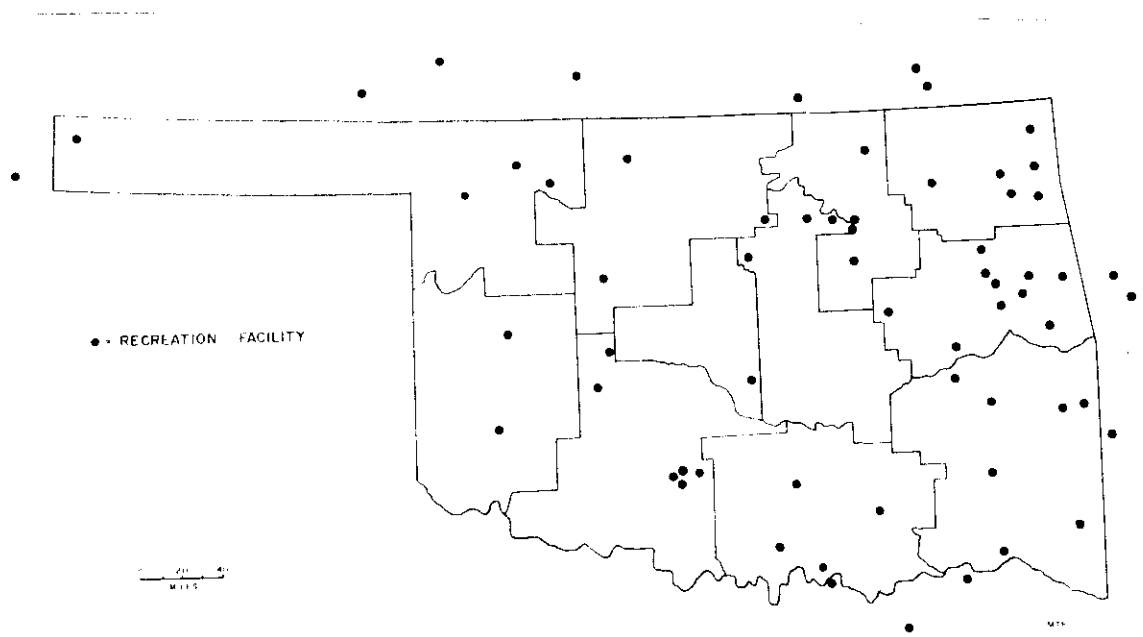
The other problem area is the Standard Metropolitan Statistical Area of Tulsa. The Tulsa metropolitan area reaches into southwestern Rogers County and western Wagoner County, yet each of these lie in another planning region.

The boundary problem that is associated with population distribution is also reflected by the identification of citizens with metropolitan areas. The citizens of McClain County, to the south of Oklahoma City, strongly identify with that city, yet Oklahoma City and McClain County are in different Substate Planning Regions. A great deal of consideration should be given to the spread of metropolitan areas and citizen identification with urbanized areas, but under the present boundaries, this apparently was not the case.

Recreation facilities represent supply points that recreationists seek out to satisfy their recreation demands (Figure 2).[4] Population

Figure 2

Recreation Areas and Substate Planning District Boundaries



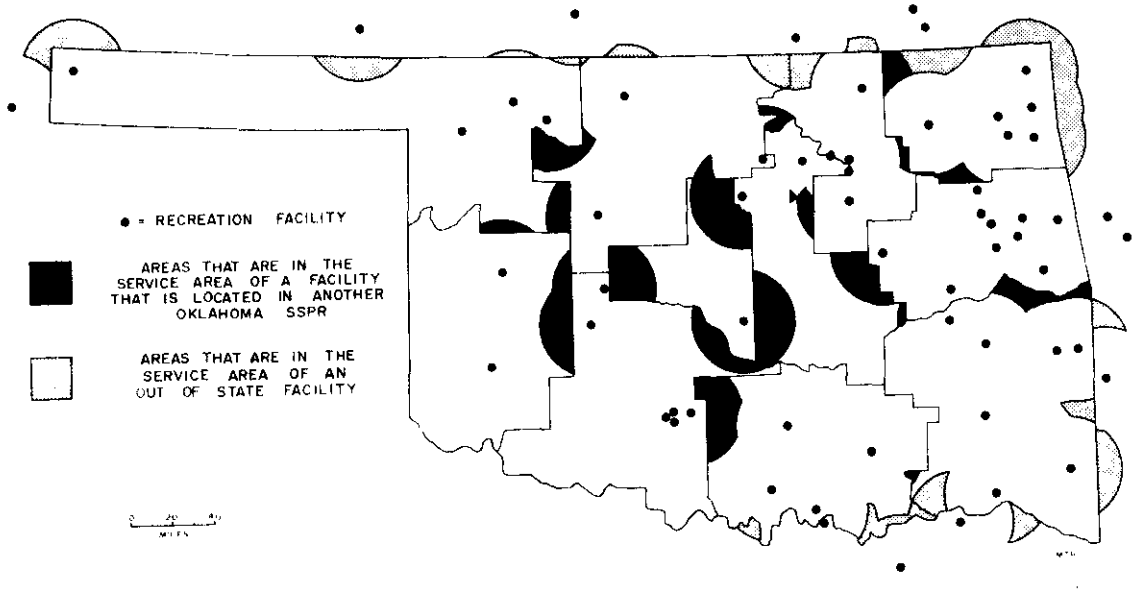
[4]All recreation facilities in Oklahoma and surrounding states which have more than twenty-five land acres were used.

centers, as demand points, interact with the supply points to yeild flows from residential locations to recreation facilities. Recreation planning would be more efficient if the regional boundaries encompassed these flows.

Another way to illustrate the inappropriateness of the present regions is to assume that all recreation facilities serve an area with a twenty-five mile radius (Figure 3)[5]. When this service area is drawn

Figure 3

Hypothetical Service Areas



around the recreation site there are many instances where people are in the service area of a facility that is in another Substate Planning

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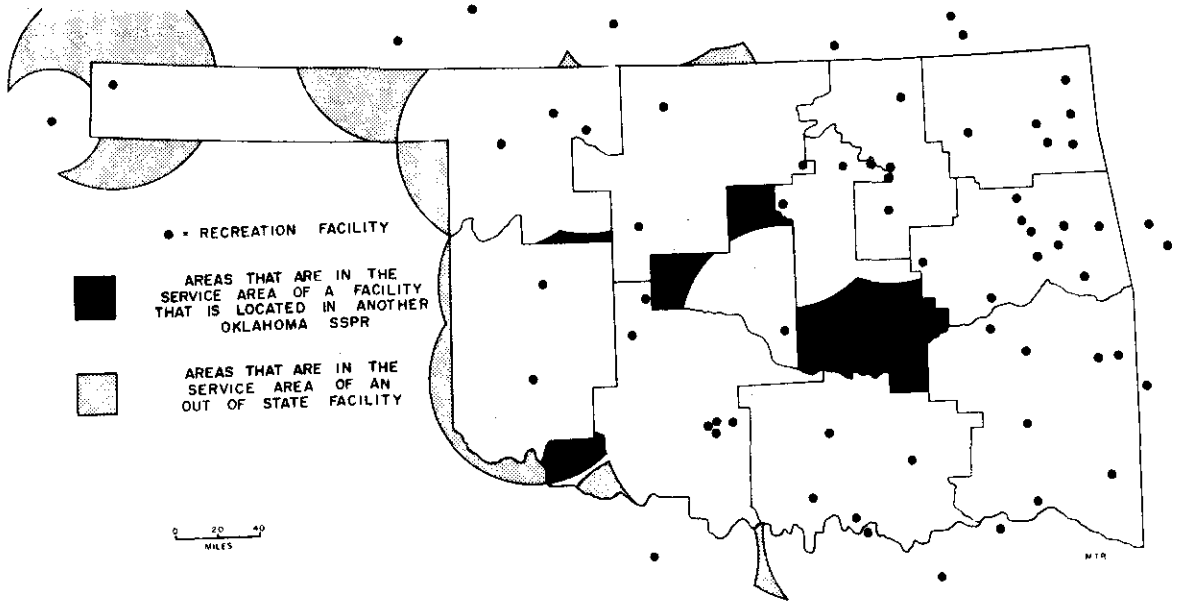
[5]Twenty-five miles is commonly used by planners as a criteria of the maximum distance a person must travel to reach a regional park, under ideal circumstances. See U.S. Bureau of Outdoor Recreation, Outdoor Recreation Space Standards, (Washington, D.C., 1967), p. 142.

Region. This creates a problem when the region's needs and demands are calculated because the planners are forecasting needs of the region based on the population within the region. In the case of regions that have only a few recreation facilities, a large proportion of the population lies in the service areas of the facilities that are outside their region. Central Oklahoma has the greatest amount of territory served by a facility in another planning region.

In recognition of the fact that some recreation facilities have a greater ability to attract, it becomes even more evident that many recreationists are in the service area of facilities outside their region. In Figure 4 the service area of all facilities having less

Figure 4

Hypothetical Service Areas

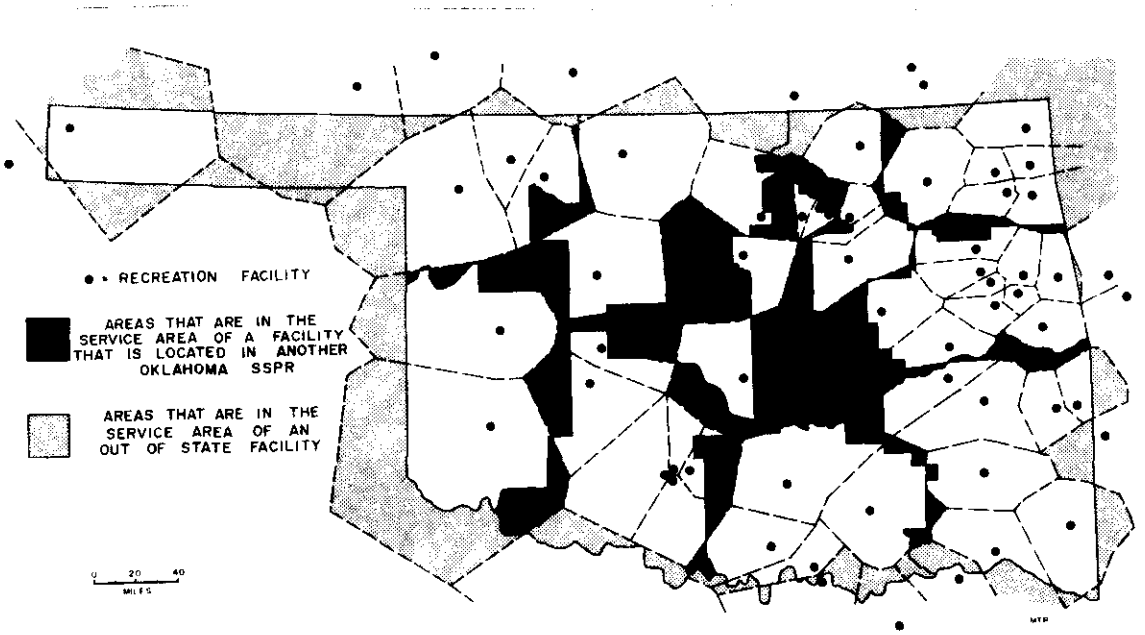


than two-hundred acres was circumscribed with a radius of twenty-five miles. Because areas with more than two-hundred acres have a greater value of attraction, they have an assigned service area radius of fifty miles.[6] With large service areas there are still several areas that are served by a facility in another region, the largest of which is in central Oklahoma.

Another approach to evaluating SSPRs in the recreation context is to assume that people are likely to travel to the nearest facility. A map of recreation facility service areas based on this premise (Figure 5)

Figure 5

Hypothetical Service Areas



[6]It is realized that actual service areas are not related as closely to size of facility as to other variables such as facilities, quality, etc., but these characteristics should create a higher level of attraction to a facility that has a greater amount of acreage.

indicates that in many instances the facilities of one region are serving residents of another region and when the location of out-of-state facilities is considered there is substantial interstate service apparent. Oklahoma has a substantial amount of area and population, particularly in central Oklahoma, that is served by a facility in another region. There is also considerable area and population that is served by a facility that is in another state. Large areas of Texas, Kansas, and Arkansas are served by facilities that are in Oklahoma, and there are many areas of Oklahoma that are served by facilities in those states. These instances where facilities serve residents of another region or state total 60 unaccounted for by the planners of both areas. The planners are over estimating the need for new facilities on one side of the boundary because they do not account for the fact that residents of their region are being served by facilities in a neighboring region, while planners on the other side are over estimating the adequacy of the facilities in their region because they do not account for the people in other regions that those facilities are serving.

The extent to which the present system of boundaries does not reflect reality and increases inefficiencies is demonstrated by Tables I and II. Table I shows that when the assignment of areas to the nearest facility type of service area is used, 14,193 square miles, or more than 20% of the land in Oklahoma, lie in the service area of a facility that is in another SSPR. It also shows that more than 20,000 square miles of land lie in the service area of a facility that is in another state. It should be pointed out that this figure represents 6,737 square miles in Oklahoma that are in the service areas of

out-of-state facilities and 13,381 square miles of land in surrounding states that are in the service areas of facilities that are in Oklahoma.

TABLE I

AREA THAT IS IN THE SERVICE AREA OF A FACILITY THAT IS LOCATED IN ANOTHER SSPR OR ANOTHER STATE

Type of Service Area	Inter-Region Service Area Within Oklahoma	Interstate Service Area
Assignment to Nearest Facility	14,193 Sq. Miles (20.2%)	20,118 Sq. Miles
25 Mile Radius	6,590 Sq. Miles (9.4%)	4,169 Sq. Miles
25 and 50 Mile Radii	4,703 Sq. Miles (6.7%)	7,510 Sq. Miles

This type of calculation was also computed to determine how many people in Oklahoma are in the service area of a facility that is in another state or in another SSPR.[7] Using the assignment to the nearest facility type of service areas, 394,979 people, more than 15% of the total population of the state, lie in the service area of a facility that is in another region. An additional 46,253 Oklahomans are in the service area of out-of-state facilities. There are also thousands more that live in surrounding states, yet they are in the service area of facilities that are in Oklahoma.

[7]These population figures were calculated by assigning each person in the state to the nearest of 180 equally spaced points. These points were 18 miles apart, so that there is an error of plus or minus 9 miles.

TABLE II

POPULATION THAT IS IN THE SERVICE AREA OF A FACILITY THAT IS LOCATED IN ANOTHER SSPR OR ANOTHER STATE

Type of Service Area	Inter-Region Service Within Oklahoma	Interstate Service
Assignment to Nearest Facility	394,979 (15.8%)	46,253 (1.5%)
25 Mile Radius	202,684 (8.1%)	35,529 (1.4%)
25 and 50 Mile Radii	123,840 (4.9%)	7,228 (.02%)

These examples of the interaction of supply and demand show that regional boundaries based on political units do not reflect reality and do not lend themselves to efficient recreation planning. Analysis of both theoretical and actual service areas demonstrates that the present system of Substate Planning Regions is entirely inadequate for recreation planning.

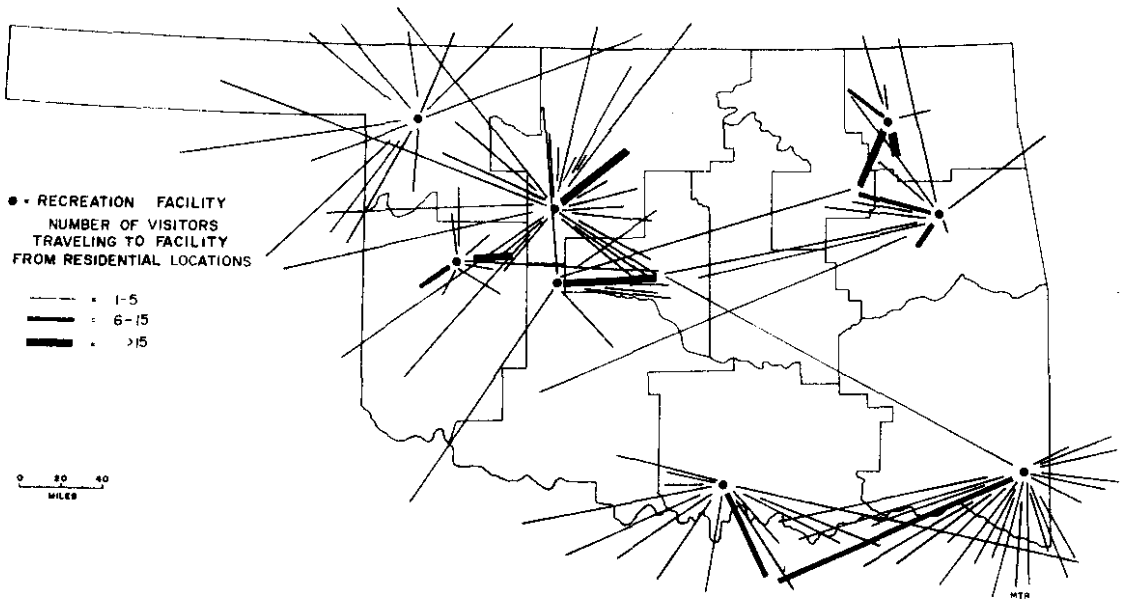
These theoretical service areas show that there are large portions of the state that prevent efficient recreation planning because the SSPR boundaries do not reflect the realities of the interaction of recreation supply and demand. They do not reflect the fact that people often times recreate at facilities that are not in their SSPR. This can also be demonstrated by the actual trips of recreationists.

Actual travel patterns of recreationists show that there are many instances where people satisfy their recreation demands by traveling to a facility that is located in a region other than the one in which

they live (Figure 6)[8]. This situation is especially acute in cases

Figure 6

Actual Service Areas



where Oklahoma recreation facilities are near the state boundary. There is a significant amount of recreation travel across state lines with people from outside the state coming to facilities in Oklahoma. This is not accounted for in the planner's demand forecast and is an especially acute problem in rural Oklahoma. It is in these areas that the population density dictates a small amount of demand, but when out-of-state recreationists are considered as potential and actual users, the situation changes drastically. The actual travel patterns

[8]These recreation trips were established from raw data that was obtained by the Oklahoma State University Department of Forestry in 1969. Only sites that had samples of 30 responses or more were included.

of recreationists show the greatest areas of inter-region travel are in the Tulsa and Oklahoma City areas and in the south central and southeastern parts of Oklahoma.

These examples of the interaction of supply and demand show that regional boundaries based on political units do not reflect reality and do not lend themselves to efficient recreation planning. Analysis of both theoretical and actual service areas demonstrates that the present system of Substate Planning Regions is entirely inadequate for recreation planning.

CONCLUSIONS

Because of the inadequacies of the present boundaries, there is an inherent overestimation of the need for new recreation facilities in regions where there are few present facilities. This is especially true along the Substate Planning Region borders. Because areas along the borders may be in the service area of a facility located in a neighboring region, there may be no need. Under the present system this service area concept is not being considered, so that the facilities in that region are the only ones considered.

Conversely, there is also a tendency under the present system to overestimate the adequacy of existing facilities in areas that have many recreation areas. Again, this is particularly true in areas that are adjacent to regional borders, because it is most likely that these facilities are being utilized by recreationists from other regions. A region that has many facilities will have service areas that overlap the regional boundaries so that those facilities will serve people from other areas. Using the present approach, it appears that a region that

has many facilities is adequately served by those facilities, when, in fact, they may be terribly inadequate.

Uniform regions based on political units will not allow efficient planning for phenomena which are inherently nodal. It would probably be better to emphasize the opportunities which are available to people and base the regions on them, rather than utilize artificial and meaningless regions. Most of the aspects of planning that the regions are used for are centered on central place functions. In most applications, planning is a tool used to facilitate the determination of the needs of people. Since a greater precentage of the population lives in urban areas, or central places, more efficient planning would result if the planning regions were focused on these areas.

If there is continued use of the present system, a system that is based on regional boundaries coinciding with political boundaries, the regions should be developed so that they represent the reality of the location of the demand and supply for recreation facilities. There should be a more judicious placement of boundaries to reflect these realities. There should also be greater recognition and consideration given to the weighting of the contribution that a region's facilities provide for the recreational well-being of its residents. In this way, it would be necessary to take the value of the facilities of a neighboring region into account. This would also dictate consideration of out-of-state facilities for those regions that are located on the state boundary.

There is a need to restructure the Substate Planning Regions in Oklahoma because they are inadequate for the purposes for which they are now being used. They are inefficient for all spheres of planning and particularly for recreation planning.

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