

INPUTS TO RECREATION PLANNING

by

Richard B. Holmes

An Internship Report Submitted to the
COMMITTEE ON URBAN PLANNING

In Partial Fulfillment of the Requirements
For the Degree of

MASTER OF SCIENCE

In the Graduate College

THE UNIVERSITY OF ARIZONA

1 9 7 3

ACKNOWLEDGMENTS

The author wishes to thank Professors George Charchalis, Henry Hightower, and Thomas Saarinen for their review of and comment on this internship report.

Dr. Hightower's outstanding contribution as internship advisor is greatly appreciated.

TABLE OF CONTENTS

	Page
LIST OF ILLUSTRATIONS	vi
ABSTRACT	vii
1. INTRODUCTION	1
2. PLANNING IN COCHISE COUNTY	3
The Planning Commission	3
The Author's Project	5
3. RECREATION AND OPEN-SPACE PLANNING	7
The Conventional Approach	7
Criticisms of the Conventional Approach	8
Summary	10
4. THE WORK THAT WAS DONE	13
Planning Strategy	13
Population Data and Projections	16
Standards for Recreational Activities	17
Inventory	18
Analysis of Needs	19
5. CRITIQUE	21
Appraisal of the Work Done	21
Evaluation of the Planning Strategy	23
A Revised Work Program	25
APPENDIX A: EXISTING AND PROJECTED POPULATION OF COCHISE COUNTY	29
APPENDIX B: STANDARDS FOR PARKS AND RECREATIONAL ACTIVITIES	42
APPENDIX C: FACILITIES REQUIRED TO MEET THE RESIDENT DEMAND FOR OUTDOOR RECREATION	48

TABLE OF CONTENTS--Continued

	Page
APPENDIX D: EXISTING RECREATION FACILITIES	51
APPENDIX E: NEEDED RECREATIONAL FACILITIES	56
LIST OF REFERENCES	58

LIST OF ILLUSTRATIONS

Figure	Page
1. The Conventional Approach	11
2. The Work Program	15
3. Revised Work Program	26

ABSTRACT

This report contains a description and critique of an internship in the Planning Department of Cochise County, Arizona. The work consisted of the collection and analysis of data for use in recreation and open-space planning. The recreation and open-space plan is an element of the County's comprehensive planning program which began in 1971.

Although an extensive program was set up for the internship, only the first phase was completed. This first phase was an analysis of the need for additional recreational facilities. A conventional approach to recreation planning was used. Standards for recreational facilities led to a quantified statement of the demand for recreation. The theoretical demand for various facilities was compared to the existing supply to obtain a list of needed additional facilities.

Partly because of the planning strategy used, and partly because of the way in which the work was done, the list of needed facilities is not very useful to the decision makers of the County. A new planning strategy is suggested in which operational goals for recreational planning are obtained directly from the County residents.

CHAPTER 1

INTRODUCTION

This internship report is concerned with the work done by the author for the Cochise County Planning Department during the summer of 1972. The work consisted of the collection and analysis of data to be used as inputs to recreation and open-space planning. This paper contains both a description of and a critique of the work experience.

Chapter 2 provides general information about Cochise County and the activities of its Planning Department. This chapter also contains a brief summary of the author's project and an explanation of how the project fit into the overall planning program of the County. Chapter 3 covers the "conventional" or "traditional" approach to recreation and open-space planning as it is described in the planning literature. The purpose of this chapter is to present the methodology that is usually followed in preparing a recreation and open-space plan. Some criticisms of this conventional approach are discussed at the end of the chapter. In Chapter 4, the work that was done is explained in detail. Three major sections of the project

(population analysis, standards for recreational facilities, and the inventory of existing facilities) are discussed separately. The final chapter is a critique of the author's work. The critique is in two parts. The first is an appraisal of the work that was actually done, and the second is an evaluation of the planning strategy that was used. This second section includes a revised planning strategy--an approach that could have resulted in more useful information under the same constraints of time and money.

CHAPTER 2

PLANNING IN COCHISE COUNTY

Cochise County is located in the southeast corner of Arizona and has an area of approximately 6,000 square miles. In 1972, about three-fourths of the estimated 69,000 residents lived in the seven small cities located in the County. The population is concentrated in the extreme southern and southwestern portions of the County. More than two-thirds of the people live in or near the County's three largest cities: Sierra Vista, Douglas, and Bisbee.

About 40 per cent of the land in the County is in private ownership, much of it in large parcels such as farms and ranches. Because of the availability of land, the Arizona climate, and other factors, a great deal of remote subdivision activity has been taking place in recent years. This increase in land subdivision has emphasized the need for planning for the orderly growth of the County.

The Planning Commission

The Planning Commission was formed by the Board of Supervisors in January, 1970. The role of the Commission is to act as an advisory body to the Board concerning the

future growth and improvement of the County. Three Commission members were appointed by each of the three Supervisors. The nine commissioners came from a variety of backgrounds including ranching, mining, the military, and small independent business.

A full-time professional planner was hired as planning director in September, 1970. The director, a graduate of Arizona State University, had received his planning education in Pennsylvania and had worked in the eastern U.S. At the time of his arrival in Cochise County, the first priority was the formation of subdivision regulations. In the summer of 1971, a comprehensive planning program was begun with the assistance of a "701" grant from HUD. Planning in Cochise County is intended to be a continuing process. Plans are not end products but are steps in the problem-solving process. The plans should be able to change as the needs and desires of the residents change.

The planning program called for the development of a general plan for land use as well as for detailed plans for water, sewer, solid waste, recreation and open-space, housing, and transportation. The land use plan, supported by development policies, zoning, and subdivision regulations, is concerned with the future growth of the County. The series of detailed plans is concerned with the

improvement of the County. Once these plans have been completed, the priority of projects for improving the County can be determined and capital improvements budgeted accordingly.

The land use plan was the most urgently needed element, so work was begun on that plan first. By the summer of 1972, the general plan and the accompanying development policies had nearly been completed. Also, a zoning ordinance and additional subdivision regulations had been drafted. The next step of the program was to begin work on some of the above-mentioned detailed plans. Three interns were employed during the summer of 1972 to assist the staff which at that time consisted of the planning director, a secretary, and a draftsman. One intern studied the subdivision activity that had been occurring and worked on a presentation of the general plan to the people of the County. Another intern developed a solid waste management plan. The author worked on the initial phase of the recreation and open-space plan.

The Author's Project

Prior to the author's employment, some work basic to the recreation and open-space plan had already been completed. Land areas suitable for recreation and for open-space had been designated as part of the land use suitability studies done by a consulting firm

(Wilsey & Ham) in 1971, and comprehensive plan goal statements relating to recreation and open-space had been formulated (Garrett, 1971). With assistance from the planning director, the author developed a program to achieve other initial steps necessary to recreation and open-space planning: determining the specific needs for recreation and open-space and determining the role of the County government in meeting these needs.

At the time the program was set up, much of what the author knew about recreation and open-space planning had been gained from reviewing existing recreation and open-space plans (Arizona Outdoor Recreation Coordinating Commission, 1967; Maricopa County Planning Department, 1971; Outdoor Recreation Resources Review Commission, 1962) during the first few weeks of employment. These plans used the "conventional" or "traditional" approach to recreation and open-space planning. This approach is described in the next chapter.

CHAPTER 3

RECREATION AND OPEN-SPACE PLANNING

One type of methodology is used in most recreation and open-space plans and is referred to as the "traditional" or "conventional" approach. In recent years, the inadequacy of this approach has become more widely recognized, and it has come under increasing criticism. This section contains a description of the conventional approach and a discussion of some of the arguments against it.

The Conventional Approach

The conventional approach, as described in the planning literature (Chapin, 1965; Satterthwaite and Marcou, 1968; Shivers and Hjelte, 1971), consists of three main sections. In the first section, the demand for different types of recreation and open-space facilities is estimated through the use of standards. A standard indicates "how much" of a given facility is necessary to meet the demand of each unit of population (acres of local park per 1,000 persons, for example). Standards may also specify "how close" (in terms of distance or travel time) the facilities should be to the population served. These

quantity and distance standards are applied to the data on the size and geographic distribution of the current and projected population. The result is a list showing the types and quantities that are "necessary" and a map showing the spatial distribution of the demand.

The second section compares demand with existing supply (inventory) in terms of quantity and location. This comparison results in a statement of the need for additional facilities. New facilities may be needed because a certain type of facility does not exist, the total quantity is insufficient, or because the existing facilities are not close enough to the population. This statement of need is essentially a set of operational goals for planning. The goals are to be achieved by providing new facilities.

The third, and final, step is the collection of data on the physical and economic resources of the community. This data is combined with information on needed facilities to produce a plan showing the types, quantities, and locations of recreation and open-space facilities to be developed.

Criticisms of the Conventional Approach

A major deficiency of the conventional approach is the way in which demand is determined. Many of the standards used are based on participation rates taken from

the Outdoor Recreation Resources Review Commission study in 1962. A participation rate for a particular activity is the number of days per year a person is involved in that activity. Knetsch (1969) points out that the so-called "demand" based on participation rates is not demand at all. Use or attendance is determined by both the demand and the availability of supply.

It should not surprise us, for example, that people in Colorado or Montreal ski in greater numbers than people in Washington, D.C. This difference does not by itself indicate differences in demand for skiing; the figures are the result of interaction between static demand and supply factors.

Using participation rates to measure demand leads to the conclusion that people only want more of what they now have. Supply affects usage. Facilities which are most abundant have the highest participation rates, and it is assumed that there is a demand for more of these facilities. Facilities which are in short supply (and therefore have low participation rates) are not considered important, even though they may be greatly desired.

In a recent article in the AIP Journal (Gold, 1972), the conventional approach to recreation planning is challenged on a number of issues. Some of these criticisms are listed below.

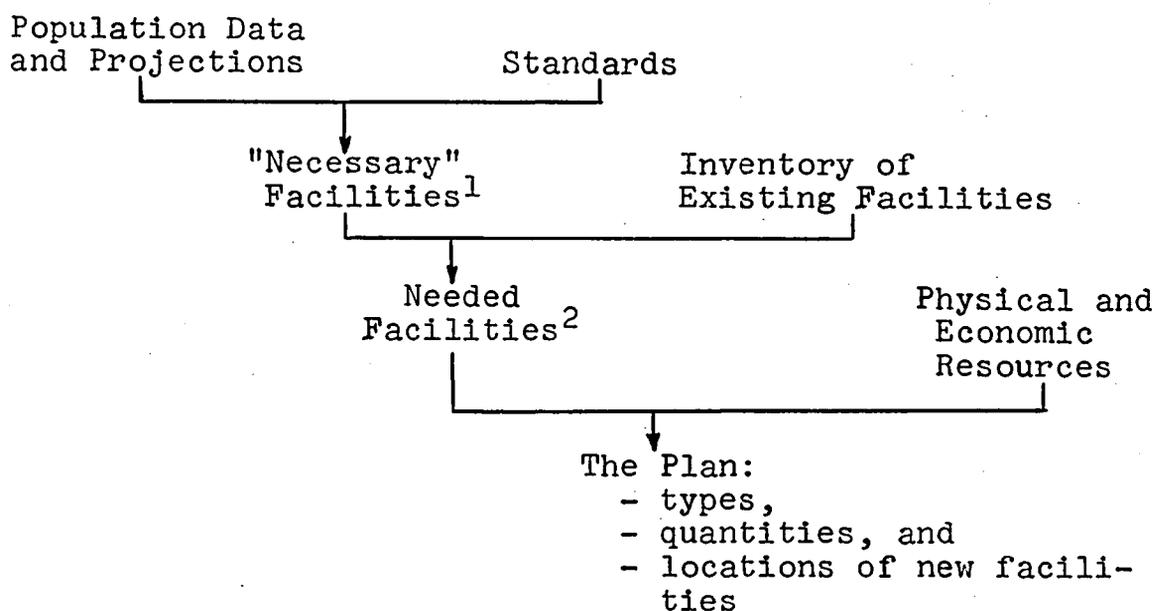
1. The conventional approach projects only the past and present trends.
2. It considers the quantitative instead of the qualitative aspects of the recreation experience.

3. It does not reflect a behavioral approach to accommodating expressed or latent demand or user needs.
4. It does not acknowledge possible trade-offs with other public or private services.
5. It does not reflect citizen participation in the planning process or a systematic survey of user preferences and satisfaction.
6. It reflects a quantitative statement of an idealized system as envisioned by the supplier, not the user.

Of the above-mentioned criticisms, numbers two and five appear to be the most serious. The conventional approach makes no attempt to directly measure the needs and desires of the community. Goals are set in an indirect way through the use of standards. Standards for recreational facilities may be based on things such as playground equipment requirements rather than on human behavior patterns (Satterthwaite and Marcou, 1968). Even the best standards, those which are adjusted to characteristics of the local population and climate, do not consider the quality of the recreational facility. For example, a small well-designed park may provide a higher level of user satisfaction than one which has the "proper" number of acres.

Summary

The general form of the conventional approach to recreation and open-space planning is shown in Figure 1. Population data, standards, and an inventory are used to



Notes

1. "Necessary" equals total required to satisfy the demand.
2. "Needed" equals "Necessary" minus existing.

Figure 1
The Conventional Approach

form an analysis of needed recreational facilities. Information on the physical and economic resources of the area is used to form a plan showing how these needs are to be met. A major criticism of this approach is that "demand," as it is commonly used in recreation and open-space planning, is not really demand. Interactions between supply and demand are generally not considered, which leads to an incorrect assumption of what is wanted. A second criticism is that citizen participation is totally excluded from the formation of operational goals for planning.

CHAPTER 4

THE WORK THAT WAS DONE

As mentioned in Chapter 2, the intent of the author's project was to determine the needs for recreation and open-space in the County and to evaluate the role of the County government in meeting these needs. The first section of this chapter is an explanation of the planning strategy developed to obtain this information. Because of the limitation of time, the entire program was not carried out. The remaining sections of the chapter describe the elements that were completed--population analysis, standards for recreational facilities, and the inventory of existing facilities.

Planning Strategy

After reviewing several recreation and open-space plans, it was felt that the conventional approach alone would not be adequate to determine the needs of the County residents. For this reason, the quantitative statement of needs based on standards was to be modified by citizen input. Priorities for development projects followed directly from the revised statement of needs. Once the

role of the County in recreation and open-space had been determined, recommendations could be made concerning future action by the County.

The general form of the planning strategy is shown in Figure 2. It can be seen that the first part of the program is essentially a conventional approach to determining the quantities and kinds of facilities that are needed in the County. The latter part of the program is a departure from the conventional approach in that citizen input and intergovernmental relations are considered. Primarily, because of a lack of time, the entire program was not completed. Only the first section, up to the quantitative statement of needs, was finished (Figure 2). The three major elements of work were the analysis of population data and projections, the development of a set of standards, and the inventory of existing facilities.

As the work was begun, the emphasis was shifted from recreation and open-space planning to simply recreation. First, various definitions of what constituted open-space appeared to make an inventory of open-space difficult. Open-space in a subdivision is that land which is not used for development. Open-space may also be considered as large natural areas and scenic vistas. Open-space may be permanent as in the case of a National Forest or temporary as in the case of vacant urban land

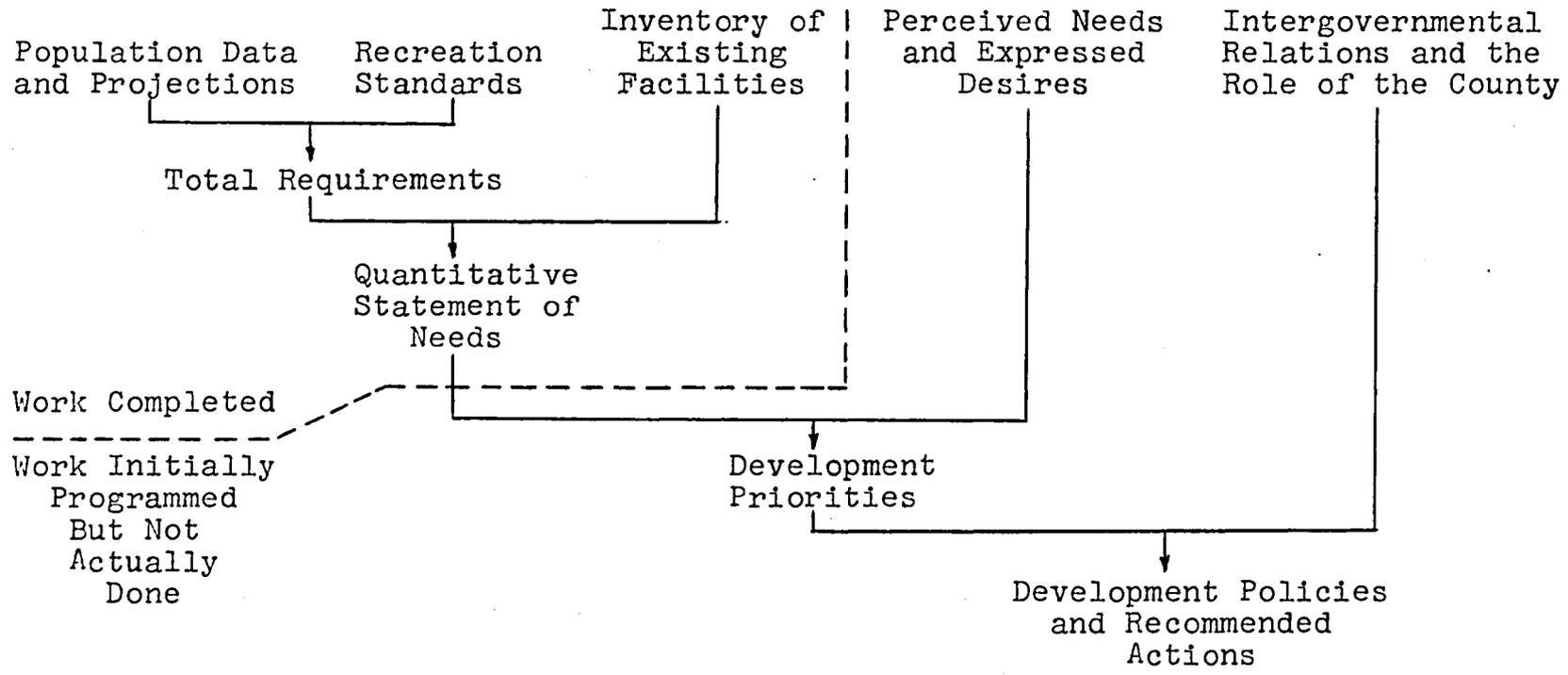


Figure 2
The Work Program

which is privately owned. An additional problem with planning for open-space (with the strategy that was used) is the lack of standards for open-space. There was also a feeling that a supply of open-space was not a problem. Most of the County has a very low density and open-space is abundant. Large amounts of open-space will be preserved under the resource conservation classification of the general land use plan. Flood plains, poor soils, steep slopes, aquifer recharge areas, and prime wildlife habitats will experience little or no development in the future.

Population Data and Projections

Many factors affect participation in recreational activities. Among these are the age, income, education, occupation, amount of leisure time, and mobility of the population (Outdoor Recreation Resources Review Commission, 1962). Originally, it was hoped that an analysis of these factors could be made for each census tract, or for several groups of census tracts, in the county. This analysis could be used to modify the recreation standards for each particular area. Unfortunately, the fourth count census data was not available at the time, so an analysis of the factors listed above was not made.

No original population projections were made. However, various population projections that had been made for the cities in the County and for the County itself were reviewed. Most of the projections were made by State agencies, but some projections for cities were prepared as part of the cities' comprehensive plans. A report on the methodology and probable accuracy of the projections was presented by the author to the Planning Commission (Appendix A).

These population figures were used in computing the quantities of facilities necessary to satisfy the demand for recreation.

Standards for Recreational Activities

Recreation standards for use in Cochise County were derived from a recent recreation plan for the State of Arizona (Arizona Outdoor Recreation Coordinating Commission [AORCC], 1967). The AORCC's plan was based largely on a national survey conducted by the Outdoor Recreation Resources Review Commission (ORRRC) in 1962. The Arizona plan started with an analysis of the characteristics of the population. This analysis was used to modify national projections on participation in outdoor activities. The AORCC then estimated the quantities of facilities that would be

necessary to meet the resident demand for various activities for the years 1965-1985.

Standards were obtained by dividing the facilities required for the entire state by the State's population. These standards are shown in Appendix B. The AORCC plan yielded standards both for parks and for specific activities. Parks are classified in four categories: neighborhood, community, district, and regional. The definitions following the park standards in Appendix B indicate what kinds of activities take place in each type of park. In addition to the normal type of standard, acres per 1,000 persons, the park standards in Appendix B specify the service radius of the park. This is a measure of "how close" the park should be to the population it serves. The standards for specific activities, such as bicycling and boating, are shown for the years 1970 and 1985. The AORCC was concerned only with outdoor recreation, so that only a limited number of activities were considered.

The standards are multiplied by the projected population for Cochise County to get the "necessary" quantities of facilities shown in Appendix C.

Inventory

Data for the inventory of existing recreational facilities was gathered mainly from secondary sources.

Major sources included the comprehensive plans of different cities in the County, the community profiles prepared by the Arizona Department of Economic Planning and Development, U.S. Forest Service publications, and the State Highway Department maps. Some additional information was gathered from discussions with public officials in some cities, and some information was obtained from first-hand observation.

Inventories were made for all of the activities for which standards were available with the exception of Nature Walks and Driving for Pleasure. Exact criteria for defining a nature trail or a scenic road did not exist. The inventories made are shown in Appendix D.

Analysis of Needs

One final task was to compare the inventory of existing facilities with the list of facilities that (in theory) are required to satisfy the demand for outdoor recreation. This comparison produced a list of needed facilities which is shown in Appendix E. The next step in the analysis would have been the mapping of the population data and the inventory data on the same map. This map, along with standards on "how close" various facilities should be to the population served, could be used to show where the additional facilities (Appendix E) were needed

the most. This map was not prepared because of the general level at which inventory data were collected. There was not sufficient detail to set specific locations for new facilities.

Work on recreation and open-space planning was continued by another intern in the fall of 1972. Additional standards and population data were used to define the outdoor recreation needs of some of the cities in the County. Also, additional inventory data for the entire County were collected. As of June 1973, no further work had been done by the Planning Department in the area of recreation and open-space planning.

CHAPTER 5

CRITIQUE

This critique is in two sections. The first is an appraisal of the element of the work program that was actually accomplished. The end product of this work, the quantitative statement of needs based on a set of standards, is reviewed with regard to its usefulness to the decision-makers of the County. The second section is a critique of the planning strategy that was used. Based on the experience of the internship, a new planning strategy is suggested. This new strategy outlines how the recreation and open-space planning would be carried out if there was an opportunity to do a similar project under conditions similar to those which existed in Cochise County in the summer of 1972.

Appraisal of the Work Done

The end result of the work is the list of needed facilities shown in Appendix E. This list, by itself, is useful only as a rough guide to the need for additional recreational facilities in Cochise County. First, standards and inventories were obtained only for a limited

number of facilities. Recreation was narrowly defined as being a few outdoor activities. Some outdoor recreation activities (such as off-the-road motorcycling) were not considered, and indoor recreation was ignored entirely. Second, with the exception of golf courses, only public facilities were counted in the inventory. Private lakes, picnic areas, and campgrounds help to satisfy the demand for these types of facilities. Third, non-resident demand for recreational facilities was not considered. The list of "required" facilities covers only the demand for recreation by Cochise County residents. The use of facilities in the County by Pima County residents and by tourists places an increased burden on Cochise County's facilities.

The major problem of the list of needed facilities is the way in which it was prepared. The conventional approach (described in Chapter 3) was used, and this is an inadequate method in many respects. Operational goals are determined by the standards, not by the residents. The standards are guesses as to what the demand for recreation actually is. The process considers only the size or quantity of recreational facilities and not their quality. The degree of user satisfaction with existing or proposed facilities is never measured. In short, Appendix E should be used with caution. The actual needs and desires of the

Cochise County residents may be quite different from what is indicated by the list of needed facilities derived from the standards.

Appendix E, however, can be used for some purposes. It represents an approximation of additional recreational facilities needed in Cochise County. Although the numbers shown may not be too accurate, the list can be used as a guide to determining priorities for new facilities. For example, the list shows a great need for water-based recreation--swimming, fishing, boating, and water-skiing. Lakes, therefore, might be considered the first priority for recreational development.

Evaluation of the Planning Strategy

As mentioned in Chapter 2, the two objectives of the internship were to determine the needs for recreation and open-space and to determine the role of the County in meeting these needs. This kind of information would assist Cochise County in deciding on future action in the area of open-space and recreation. The planning strategy set up to achieve these two objectives is outlined in Figure 2, and as indicated in that diagram, only the first part of the work that was programmed was completed. In retrospect, it appears that a different strategy to

determine the need for additional facilities could have produced more useful information in the time available.

The conventional approach was intended to be the primary method by which the need for additional recreational facilities was to be determined. Citizen input was intended only to assist in forming priorities among the needed facilities. However, if a thorough job could have been done on finding out the desires of the people, the conventional approach could have been eliminated entirely. As discussed earlier, the use of standards results in a list of needs that is not too accurate. A survey of County residents would likely yield results which come closer to the actual needs for recreation and open-space. Also, the survey probably would not take any more time than was spent by the author on the conventional approach.

Analysis of intergovernmental relations and the role of the county should remain in the work program. Determining the role of the County in meeting recreation and open-space needs is perhaps as important as finding out what the needs are. All other levels of government (city, state, federal) are suppliers of some type of recreation or open-space facility in the County. The actions to be taken by Cochise County depend upon the unmet needs and upon the roles, responsibilities, and plans of other governmental agencies.

A Revised Work Program

A proposed new work program for the author's internship is shown in Figure 3. The program is identical to the one set up for the summer of 1972 except that the conventional approach to determining needed facilities is eliminated. It is suggested that the types, quantities, and locations of needed facilities be determined directly from the County residents.

The first question that arises is how this citizen input is to be obtained. In the summer of 1972, citizen participation in planning in Cochise County was in the early stages of development. Therefore, to find out the needs and desires of the people, a special survey would have been necessary. Questionnaires could have been sent to the 100 people contacted in the goals survey of 1971 (Garrett, 1971), or to a random sample of the County residents. Whatever the group to be surveyed, it is important to have a sample which represents all of the County's people.

The survey questionnaire should allow open-ended responses to questions about what is desired in the way of open-space and recreation. Expected responses would cover indoor and outdoor recreation and public and private recreational facilities. The County government would be most interested in responses concerning public open-space

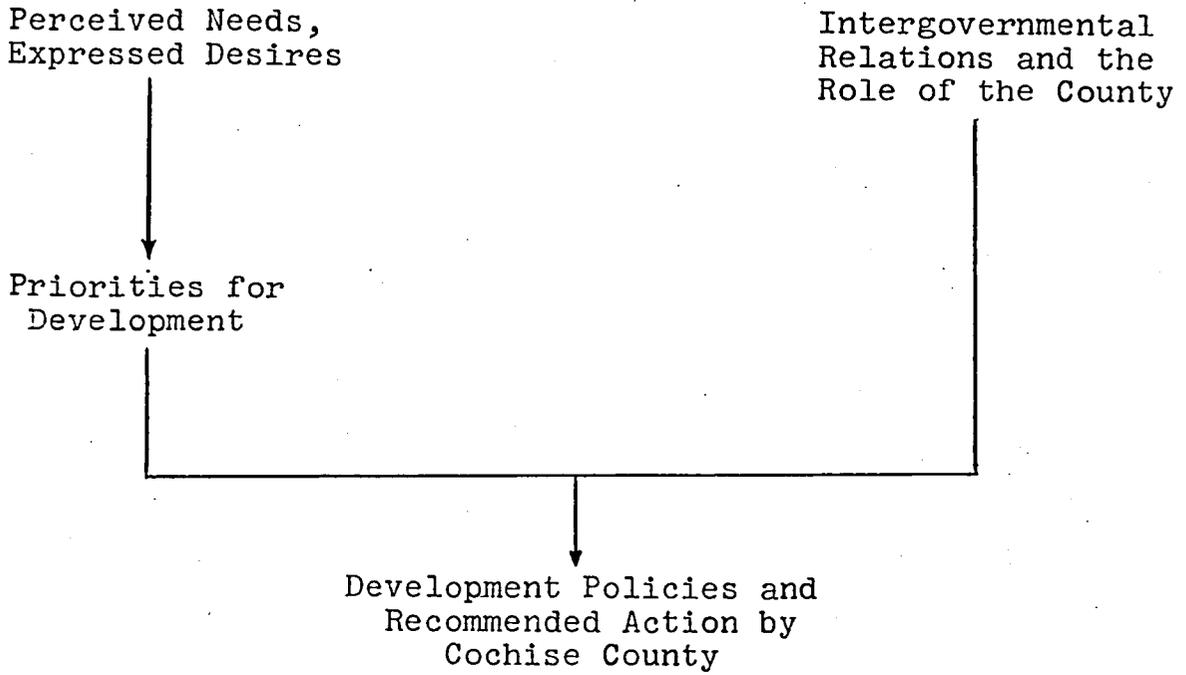


Figure 3
Revised Work Program

and recreation. Some questions in this area might be: Is more public open-space land needed? What kinds of new facilities are wanted? Should new facilities be constructed in existing parks or elsewhere? Is the problem a lack of facilities or is it inadequate access to existing facilities? The answers to these types of questions would show the kind of facilities that are most wanted and where they are most needed. It is believed that the statement of needs derived from the survey would be more accurate than the statements of needs derived from standards.

The role of the County in meeting the expressed needs must be evaluated before future action by the County can be planned. Depending on the nature of the need and the plans of other government agencies, a County parks and recreation department might be formed to run facilities to be developed and owned by the County. The open-space and recreation plan would show locations of future facilities and the priorities by which they would be developed. However, it may turn out that the needs will be, or should be met either by the cities or by the state or federal governments. In this case, the County would not enter into the construction and development of a separate system of facilities. The recreation and open-space "plan" of the County might consist of financial assistance to cities

and/or negotiations with state and federal government agencies to persuade them to construct facilities in Cochise County.

The proposed new work program is similar to the one set up by the author for the internship. The major difference is that in the new program, the need for additional recreation and open-space facilities is determined from a survey of the County residents rather than from a list of standards. A major "product" of this work would be an analysis of the type of recreation and open-space plan needed by Cochise County.

APPENDIX A

EXISTING AND PROJECTED POPULATION OF COCHISE COUNTY

This section gives some information about the existing population of Cochise County and presents population projections which have been made for the county as a whole and for the individual cities. As a step in determining what the present and future recreation needs are, it is necessary to know something about the size and location of the present and future population.

Existing Populations

In 1970, Cochise County had a population of 61,910. The combined population of the seven incorporated cities was over 35,000 or about 57% of the total. With the annexation of Fort Huachuca into Sierra Vista in 1972, the portion of the population in incorporated areas increased to almost 70%. The remaining 30% of the people are located in rural areas and in several small communities scattered throughout the county.

Much of the population is concentrated in the southern part of the county. More than 2/3 of the people

live in or near Douglas, Bisbee, and Sierra Vista. Most of the other 1/3 live in the San Simon, Sulphur Springs and San Pedro River valleys. The mountainous areas, as would be expected, have the fewest people.

Population Projections for Cochise County

At least three population projections have been made for Cochise County (Table I). The 1967 Plan for Outdoor Recreation in Arizona included a projection supplied by the consulting firm of Daniel, Mann, Johnson, and Mendenhall (DMJM). The 1975 and 1980 populations of the county were given but there was no explanation as to how the projections were made. The other two projections were made by state agencies and the methods used are explained in Arizona Population Projections: The Current State of the Art (1971).

Employment Security Commission

The Commission uses the "cohort component method" to make its projections for Cochise County. This is the same method used nationwide by the Bureau of the Census and involves making separate projections of the three components of population change: births, deaths, and net migration. The three projections are then combined to get a figure for the future population. Net migration is assumed to continue as observed during the period

TABLE IProjected County Population

<u>Source</u>		<u>1975</u>	<u>1980</u>	<u>1990</u>
DMJM Economics (1967) used for 1967 Arizona Outdoor Recreation Plan		75,000	81,000	
Employment Security Commission, Unem- ployment Compensa- tion Division (1969)	Low: High:	80,200 83,700	90,300 97,100	
Department of Economic Planning and Development (1971)	Low: Med: High:	67,200 68,700 70,200	72,100 74,800 77,500	89,200 92,600 96,000

1955-1965, and projected deaths are based on 1957 statistics. The projection of births is the most uncertain of the three components so two different fertility assumptions are used. The use of two fertility assumptions is the reason why there are both high and low population projections for each year.

Department of Economic Planning and Development

DEPAD uses what might be called the "ratio method" for projecting the county's population. The first step is to calculate the ratio of the county's population to that of the state for 1950, 1960, and 1970. It is noted whether this ratio is increasing or decreasing and the trend is projected into the future to determine what the county's share of the state's population will be in 1975, 1980, and 1990. Finally, the county's share in a particular year is multiplied by the projected state population for that year to give the projected county population. The Bureau of the Census has made high and low projections for Arizona for 1975, 1980, and 1990 so there are both high and low projections for Cochise County for those years. The medium projection shown is simply an average of the high and low projections.

Evaluation of the Projections

Of the three projections presented in Table I, the DEPAD projection is probably the most accurate, not because of methodology but because it is based on more accurate information. The other two projections were made in 1967 and 1969. At that time, the 1970 population of Cochise County was expected to be around 70,000. The actual 1970 population was only about 62,000. The DEPAD projection, made in 1971, was able to incorporate the 1970 data and therefore may be more accurate than the other two projections. Even though DEPAD's projection is the best of the three it needs to be modified slightly. As explained earlier, the "ratio method" is based upon the long-term relationship between the county and state populations. The method used cannot account for sudden increases or decreases in the county's population. However, a sudden and significant increase in the county's population has occurred due to the moving of the Army Intelligence School to Fort Huachuca. This increase was estimated at 4,000 and was expected to take place during 1971 (DEPAD, 1971b). Using the growth rates calculated by DEPAD, this 4,000 increase during 1971-1972 would add 4,300 people to the 1975 projection, 4,700 to the 1980 projection, and 5,800 to the 1990 projection. Table II shows these modified DEPAD projections.

TABLE IIProbable Future Population of Cochise County
(Modified DEPAD Projections)

	<u>1975</u>	<u>1980</u>	<u>1990</u>
Low	71,500	76,800	95,000
Med.	73,000	77,500	98,400
High	74,500	79,500	101,800

Population Projections for Cities
in Cochise County

Population projections for the seven incorporated cities in Cochise County are given in Table III. The projection for Bisbee is from the city's 1971 comprehensive plan prepared by Ferguson, Morris and Associates. The projection is based on past trends as well as future state, regional, and local trends which may influence the city's growth and development.

DEPAD is the source of the other six projections. For Douglas, the "ratio method" was used to predict the 1975, 1980, and 1990 populations. The technique was the same as described earlier except that the relevant ratio was between the city and the county rather than the county and state.

In the remaining five communities, a more simplified method of projecting population was used. Where past data were available, an annual average rate of growth was calculated and projected forward as a median rate of growth. The high and low population figures are plus or minus one percent of the median projected population. In some cases, significant deviations from the annual average rates of growth were anticipated. In these cases the judgment of the researcher was used to adjust the projection.

TABLE IIIProjected Population of Cities

		<u>1975</u>	<u>1980</u>	<u>1990</u>
Benson	Low	3,013	1,198	3,603
	Med.	3,165	3,528	4,385
	High	3,323	3,889	5,328
Bisbee	Low			
	Med.	8,800	9,300	9,800
	High			
Douglas	Low			
	Med.	13,700	15,000	18,500
	High			
Huachuca City	Low	1,766	1,820	1,913
	Med.	1,821	1,913	2,114
	High	1,866	2,010	2,332
Sierra Vista	Low	24,836	25,924	28,589
	Med.	25,214	26,809	31,020
	High	25,610	27,783	33,955
Tombstone	Low	1,220	1,150	1,040
	Med.	1,220	1,175	1,125
	High	1,240	1,240	1,240
Willcox	Low	2,832	2,698	2,835
	Med.	2,766	2,979	3,457
	High	2,905	3,286	4,206

Evaluation of the Projections

These projections are "best guesses" of future population, past trends adjusted by judgment. Their accuracy is not known, but since there appears to be no other way of making projections for relatively small communities, these projections must be accepted.

Population Projections for the Rural

Areas of Cochise County

It is difficult, if not impossible, to make accurate population projections for rural areas for two reasons. First, there is a lack of information about population trends in past years. There are no real population centers for which information has been collected over a long period of time. Second, even if the data were available, there are no methods for projecting population in large, low-density areas.

Although no specific projections can be made, the number of people in the unincorporated areas can be approximated by subtracting the total projected population of the cities from the projected county population. These figures are shown in Table IV.

Evaluation of the Projection

Because this projection was made using two other projections, it is probably less accurate than either one

TABLE IV

Projected Population of the Unincorporated Areas of Cochise County

	<u>Projected County Population (A)</u>	<u>Total Projected Population of Cities (B)</u>	<u>Projected Population of Unincorporated Areas (A-B)</u>
1975:	73,000*	56,700	16,300
1980:	79,500*	60,700	18,800
1990:	98,400*	70,400	28,000

*These figures are the average of the high and low modified DEPAD projections.

of them. Since there is no direct method for projecting the rural population, the indirect method is about all that can be done.

General Comments on Population Projections

The twenty year period, 1970-1990, over which these projections have been made is long enough for changes to occur in all three components of population change, births, deaths, and net migration. Changes in the death rate are likely to be small and the effects of changes in the birth rate can be minimized by making high and low projections. The component with the greatest potential for change is net migration. Economic development and residential development both have a significant effect on the net migration rate. If new business and industry do not develop at the expected rate, the projections will be far from accurate. One of the greatest unknowns is the amount of residential development that will take place. Presently, there are over 70,000 residential subdivision lots in the county. The extent to which people move onto these lots will greatly affect the future population of Cochise County.

As with all projections into the future, population projections become less accurate with time. Given the magnitude of the uncertainties facing the county, it is

reasonable to say that the 1975 projections are fairly accurate, that the 1980 projections are good enough to be used for most purposes, and that the 1990 projections are only rough approximations of what actually exist in 1990.

Summary

Table V indicates that the county will have a substantial amount of growth during the next twenty years. By 1990, the population of the county will be more than 98,000, an increase of nearly 60% over the 1970 population.

The distribution of the population will not change greatly. The largest increases are expected to take place in the areas that already have greatest numbers of people. In the years following the annexation of Fort Huachuca into Sierra Vista, the ratio of the people in incorporated areas to those in unincorporated areas is expected to remain constant. In general, the incorporated cities will have about $3/4$ of the county's population and the other $1/4$ will live in unincorporated areas.

TABLE V

Summary of Existing and Projected Population

<u>County Population</u>			<u>Population of Cities</u>		<u>Population of Unincorporated Areas</u>	
<u>number</u>	<u>% increase over 1970 population</u>		<u>number</u>	<u>% of total population</u>	<u>number</u>	<u>% of total population</u>
1970:	61,910	--	35,360	57%	26,550	43%
1972:*	68,600	11%	50,700	74	17,900	26
1975:	73,000	18	56,700	78	16,300	22
1980:	79,500	28	60,700	76	18,800	24
1990:	98,400	59	70,400	72	28,000	28

*Annexation of Fort Huachuca into Sierra Vista.

APPENDIX B

STANDARDS FOR PARKS AND RECREATIONAL ACTIVITIES

Park Standards

<u>Type of Park</u>	<u>National Recreation Association¹</u>	<u>California Committee¹</u>	<u>Maricopa County²</u>
<u>Neighborhood</u>			
service radius (miles)	0.2 - 0.4	0.1 - 0.3	0.1 - 0.5
population served (000)	2 - 5	2 - 4.5	3 - 6
size (acres)	8 - 15	8 - 18	0.5 - 6
acres/1000 population	3.3	4.0	---
<u>Community</u>			
service radius (miles)	0.5 - 1.5	1	1 - 4
population served (000)	15 - 35	18 - 25	19 - 32
size (acres)	15 - 40	24 - 37	17 - 47
acres/1000 population	1.1	1.4	1.25
<u>District (includes golf courses)</u>			
service radius (miles)	1.5 - 2.5	---	30-60 minutes
population served (000)	50	50	50
size (acres)	100 - 500	300 +	150 - 300
acres/1000 population	6.0	6.0	5.0

Park Standards, Continued

<u>Type of Park</u>	<u>National Recreation Association¹</u>	<u>California Committee¹</u>	<u>Maricopa County²</u>
<u>Regional</u>			
service radius (miles)	10 - 15	10 - 30	1-2 hours
population served (000)	50 - 100	---	all
size (acres)	500 - 1,000	---	100 (minimum)
acres/1000 population	10	---	10 - 25

- Sources: 1. Arizona Outdoor Recreation Coordinating Commission (1967).
 2. Maricopa County Planning Department (1971)

Definitions for Park Standards

Neighborhood Park:

A neighborhood is an area generally served by an elementary school. A neighborhood recreation unit may be either a combination elementary school and park or a separate recreation center development.

- Facilities:
1. play area for pre-school and elementary school children
 2. sports field
 3. paved areas for court games
 4. family picnic and barbecue area
 5. quiet area
 6. park areas for free play
 7. off-street parking

Community Park:

A community is an area composed of two or more neighborhoods and generally served by one or more secondary schools. A community recreation unit may be either a combination secondary school and park or a separate recreation center development.

- Facilities:
1. large sports field with night lighting
 2. paved areas for court games
 3. play areas for pre-school and elementary school children
 4. concrete slab primarily for dancing with night lighting
 5. family and group picnic and barbecue area
 6. park area for free play
 7. area for special events
 8. regulation swim pool
 9. natural area
 10. quiet area
 11. off-street parking

District Park:

A district is an area composed of two or more communities within a municipality or urban area. A district park might also be called a city-wide or county park.

- Facilities:
1. open and natural areas
 2. family and group picnic and barbecue areas
 3. day camp areas
 4. play areas for pre-school and elementary school children
 5. sports fields
 6. paved areas for court games
 7. golf course
 8. outdoor theater
 9. various recreation and eating concessions
 10. parking areas

Regional Park:

A regional park consists of a recreation area from 500 to 1,000 acres or more. The exact site depends upon topographic features and the planned use of the site. Emphasis is on the outdoor environment.

- Facilities:
1. swimming
 2. boating
 3. fishing
 4. golf
 5. tennis
 6. day camping
 7. hiking and riding
 8. picnicking within a natural environment.

Source: Arizona Outdoor Recreation Coordinating Commission, 1967.

STANDARDS FOR RECREATION ACTIVITIES

<u>Activity</u>	<u>Year</u>	<u>The Standard</u>
Bicycling	1970	0.72 miles/1000 persons
	1985	0.87 miles/1000 persons
Boating	1970	24.4 surface acres/1000 persons
	1985	30.5 surface acres/1000 persons
Camping	1970	2.1 acres/1000 persons
	1985	2.1 acres/1000 persons
Driving for Pleasure	1970	2.3 miles of scenic roads/1000 persons
	1985	2.7 miles of scenic roads/1000 persons
Fishing	1970	3.2 surface acres/1000 persons
	1985	3.5 surface acres/1000 persons
Golfing	1970	0.033 18-hole golf courses/1000 persons
	1985	0.033 (1 18-hole golf course for 30,000 persons)
Hiking	1970	0.73 miles of trail/1000 persons
	1985	0.93 miles of trail/1000 persons
Horseback Riding	1970	0.94 miles of trail/1000 persons
	1985	0.90 miles of trail/1000 persons
Nature Walks	1970	0.039 miles/1000 persons (1 mile for 25,600 persons)
	1985	0.046 miles/1000 persons (1 mile for 21,700 persons)
Picnicking	1970	1.0 acres/1000 persons
	1985	1.0 acres/1000 persons
Playing Outdoor Games and Sports	1970	5.3 acres/1000 persons
	1985	7.1 acres/1000 persons
Roadside Rest/ Recreation Area	1970	0.046 areas/1000 persons (1 area for 21,700 persons)
	1985	0.054 areas/1000 persons (1 area for 18,500 persons)

<u>Activity</u>	<u>Year</u>	<u>The Standard</u>
Swimming:		
-swimming pools	1970	1,500 square feet of pool/1000 persons
	1985	1,700 square feet of pool/1000 persons
-beaches	1970	0.12 acres of beach/1000 persons
	1985	0.12 acres of beach/1000 persons
Water Skiing	1970	29.9 surface acres/1000 persons
	1985	34.0 surface acres/1000 persons
Winter Sports	1970	0.1 acres/1000 persons
	1985	0.1 acres/1000 persons

Source: Arizona Outdoor Recreation Coordinating Commission, 1967.

APPENDIX C

FACILITIES REQUIRED TO MEET THE RESIDENT
DEMAND FOR OUTDOOR RECREATION

Park Requirements

<u>Year</u>	<u>Neighborhood and Community Parks</u>	<u>District Parks</u>	<u>Regional Parks</u>
1970	300 acres	300 acres	600-1200 acres
1985	400 acres	400 acres	800-1600 acres

Specific Facilities Requirements

<u>Activity</u>	<u>Year</u>	<u>Facilities Required</u>
Bicycling	1970	44 miles
	1985	71 miles
Boating	1970	1,510 surface acres
	1985	2,500 surface acres
Camping	1970	130 acres
	1985	172 acres
Driving for Pleasure	1970	142 miles of scenic roads
	1985	221 miles of scenic roads
Fishing	1970	198 surface acres
	1985	287 surface acres
Golfing	1970	2 18-hole golf courses
	1985	3 18-hole golf courses
Hiking	1970	45 miles of trail
	1985	76 miles of trail
Horseback Riding	1970	58 miles of trail
	1985	74 miles of trail
Nature Walks	1970	2 miles of trail
	1985	4 miles of trail
Picnicking	1970	62 acres
	1985	82 acres
Playing Outdoor Games and Sports	1970	328 acres
	1985	584 acres
Roadside Rest/ Recreation Area	1970	3 areas
	1985	4 areas
Swimming		
	- pools	
	1970	92,860 square feet
	1985	139,400 square feet
- beaches		
	1970	7 acres
	1985	10 acres

<u>Activity</u>	<u>Year</u>	<u>Facilities Required</u>
Water Skiing	1970	1,850 surface acres
	1985	2,790 surface acres
Winter Sports	1970	6 acres
	1985	8 acres

APPENDIX D

EXISTING RECREATION FACILITIES

Camp Sites and Picnic Areas

<u>Name of Area</u>	<u>Approx. Elevation</u>	<u>Season of Use</u>	<u>Camp- ing</u>	<u>Hunt- ing</u>	<u>Fish- ing</u>	<u>Drink- ing Water</u>	<u>Total Family Units</u>
Cochise Stronghold	4900	All year	X	X	---	X	25
Chiricahua Nat. Mon.	5300	All year	X	---	---	X	37
Pinery Canyon	6000	Apr.-Nov.	X	X	---	X	8
Rustler Park	8200	May-Sept.	X	X	---	X	25
West Turkey Creek	5000	May-Oct.	X	X	---	X	7
Sycamore	6200	May-Oct.	X	X	---	X	4
Herb Martyr	5800	Apr.-Oct.	---	X	---	X	8
John Hands	5500	Apr.-Oct.	---	X	---	X	6
South Fork	4600	Apr.-Nov.	X	X	---	---	4
Sunny Flat	4600	Apr.-Nov.	X	X	---	X	4
Stewart	4500	Apr.-Nov.	X	X	---	X	6
Idlewild	4500	Apr.-Nov.	X	X	---	X	10
Rucker Canyon	5500	Apr.-Nov.	---	X	X	X	12
Cypress Park	6000	Apr.-Nov.	X	X	X	X	7
Bathtub	6500	Apr.-Nov.	---	X	X	---	13

51

<u>Name of Area</u>	<u>Approx. Eleva- tion</u>	<u>Season of Use</u>	<u>Camp- ing</u>	<u>Hunt- ing</u>	<u>Fish- ing</u>	<u>Drink- ing Water</u>	<u>Total Family Units</u>
Rucker Lake	6500	Apr.-Oct.	X	X	X	X	14
Rucker Forest Camp	6500	Apr.-Oct.	X	X	X	X	14
Coronado Nat. Mem.	5400	All year	---	---	---	---	32
Lakeview	5500	All year	X	X	X	X	60

Source: U. S. Forest Service

Hiking Trails

	<u>miles</u>
National Forest - Chiricahua Mountains	145
National Forest - Winchester Mountains	8
National Forest - Whetstone Mountains	1
National Forest - Dragoon Mountains	3
National Forest - Huachuca Mountains	34
Chiricahua National Monument	30
Coronado National Memorial	3
TOTAL:	<u>224</u>

Riding Trails

It is assumed that one half of the National Forest Service trails are suitable for horseback riding.

TOTAL miles of trails: 96

Fishing

Lakes		<u>acres</u>
-Parker Lake		125
-Rucker Lake		2
	TOTAL:	<u>127</u>
Streams		<u>length</u>
	<u>avg. width</u>	
-Cave Creek	6'	10 mi.
-Rucker Creek	6'	2
-Turkey Creek	6'	5
	TOTAL:	<u>17</u> mi.

Boating

	<u>acres</u>
Parker Lake (limited)	125
Rucker Lake (limited)	2
TOTAL:	<u>127</u>

Golf Courses

<u>Name</u>	<u>Number of Holes</u>
Yucca Sierra Country Club	9
Twin Lakes County Club	9
Sunset Valley County Club	9
Sun Sites	9
Douglas Golf Club	9
Bisbee County Club	9
Ft. Huachuca Golf Course	9
TOTAL:	<u>63</u>

Local Parks

Willcox Little League Field
 Willcox City Park
 Tombstone City Park
 Douglas 15th St. Park
 Douglas 8th St. Park
 Douglas 10th St. Park
 Bisbee Vista Park
 Warren Ballpark
 Bisbee Swimming Pool
 Bisbee Ballpark
 Sierra Vista City Park
 Benson City Park

Roadside Rest Areas

I-10 near Texas Canyon
 US 80 south of St. David
 US 666 south of Elfrida
 US 80 north of Bisbee

Zoos

Bisbee Zoo

Summary of Existing Recreational Facilities

<u>Activity</u>	<u>Facilities</u>
Bicycling	0 miles of trail
Boating	127 acres (limited)
Camping	170 acres
Fishing	127 acres
Golfing	3.5 18-hole courses
Hiking	225 miles of trail
Horseback Riding	96 miles of trail
Picnicking	42 acres ^a
Playing Outdoor Games and Sports	350 acres ^b
Roadside Rest Areas With Facilities	5 acres
Swimming	24,000 sq. ft. of pool (approx.) 0 acres of beach
Water Skiing	0 acres
Winter Sports	0 acres

a. Does not include picnicking at local parks or roadside rest areas.

b. A very rough estimate: 150 acres at local parks
200 acres at school play-
grounds and playfields.

APPENDIX E

NEEDED RECREATIONAL FACILITIES

Facilities

56

<u>Activity</u>	<u>Year</u>	<u>"Required"</u>	<u>Existing</u>	<u>Needed</u>
Bicycling	1970	44	0	44 miles of 71 trail
	1985	71		
Boating	1970	1,510	127	1,383 surface 2,373 acres
	1985	2,500		
Camping	1970	130	170	0 acres 2
	1985	172		
Driving for Pleasure	1970	142	?	? miles of ? scenic roads
	1985	221		
Fishing	1970	198	127	71 surface 160 acres
	1985	287		
Golfing	1970	2	3-1/2	0 18-hole 0 courses
	1985	3		
Hiking	1970	45	225	0 miles of 0 trail
	1985	76		

<u>Activity</u>	<u>Year</u>	<u>Facilities</u>		
		<u>"Required"</u>	<u>Existing</u>	<u>Needed</u>
Horseback Riding	1970	58	96	0 miles of
	1985	74		0 trail
Nature Walks	1970	2	?	? miles of
	1985	4		? trail
Picnicking	1970	62	42	20 acres
	1985	82		40
Playing Outdoor Games and Sports	1970	328	350	0 acres
	1985	584		234
Roadside Rest/ Recreation Areas	1970	3	5	0 areas
	1985	4		0
Swimming				
- pools	1970	92,860	24,000	68,860 sq. ft.
	1985	139,400		115,400
- beaches	1970	7	0	7 acres
	1985	10		10
Water Skiing	1970	1,850	0	1,850 surface
	1985	2,790		2,790 acres
Winter Sports	1970	6	0	6 acres
	1985	8		8

LIST OF REFERENCES

- Arizona Department of Economic Planning and Development
(1971a) "Arizona Population Projections: The
Current State of the Art " (Phoenix)
- Arizona Department of Economic Planning and Development
(1971b) "Environmental Services Needs Study,
Cochise County" (Phoenix)
- Arizona Outdoor Recreation Coordinating Commission (1967)
"A Plan for Outdoor Recreation in Arizona"
(Phoenix)
- F. Stuart Chapin, Jr. (1965) Urban Land Use Planning, 2nd
ed. (Urbana, University of Illinois Press)
- Ferguson, Morris, and Associates (1971) "Comprehensive Plan
for Bisbee, Arizona" (Phoenix)
- William H. Garrett (1971) "Formulation of Comprehensive
Plan Goal Statements--A Process" (Unpublished
M.S. Internship Report, University of Arizona,
Tucson)
- Seymour M. Gold (1972) "Nonuse of Neighborhood Parks,"
Journal of the American Institute of Planners 38
(6) 369-378
- Jack L. Knetsch (1969) "Assessing the Demand for Outdoor
Recreation," Journal of Leisure Research 1 (1),
85-87
- Maricopa County Planning Department (1971) "A Park,
Recreation, and Open-Space Plan" (Phoenix)
- Outdoor Recreation Resources Review Commission (1962)
Outdoor Recreation for America (U.S. Government
Printing Office, Washington, D.C.)
- Ann Satterthwaite and George Marcou (1968) "Open-Space,
Recreation, and Conservation," in Principles and
Practice of Urban Planning, W. I. Goodman and
E. C. Freund, eds. (International City Managers'
Association, Washington, D.C.), 185-207

Jay S. Shiver and George Hjelte (1971) Planning Recreational Places (Associated University Presses, Cranbury, N.J.)

Wilsey & Ham (1972) "Cochise County Comprehensive Planning Program Phase I Summary Report" (Tucson)