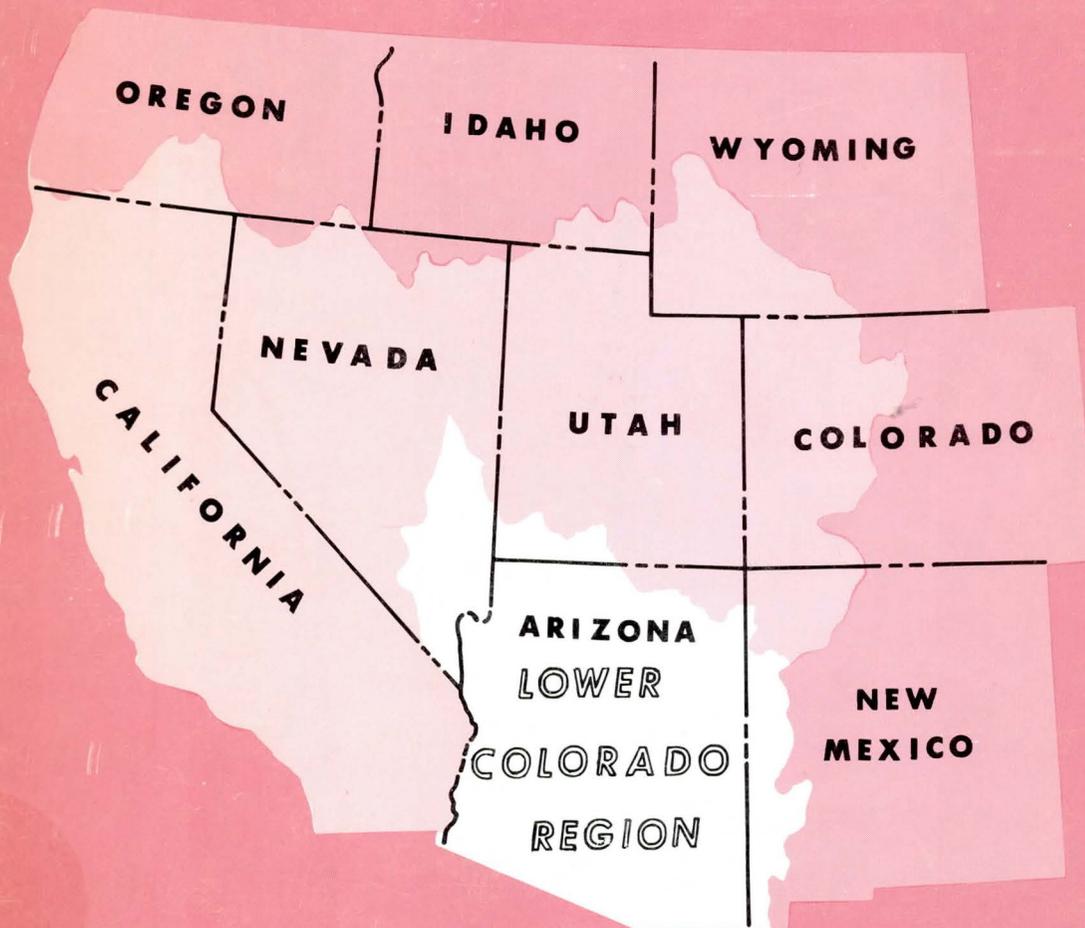


LOWER COLORADO REGION Comprehensive Framework Study

APPENDIX XII
RECREATION
JUNE 1971



PREPARED BY:

LOWER COLORADO REGION STATE - FEDERAL
INTERAGENCY GROUP FOR THE
PACIFIC SOUTHWEST INTERAGENCY COMMITTEE

FS-11

APPENDIXES TO THE MAIN REPORT

LOWER COLORADO REGION

APPENDIX I - HISTORY OF STUDY

APPENDIX II - THE REGION

APPENDIX III - LEGAL AND INSTITUTIONAL ENVIRONMENT

APPENDIX IV - ECONOMIC BASE AND PROJECTIONS

APPENDIX V - WATER RESOURCES

APPENDIX VI - LAND RESOURCES AND USE

APPENDIX VII - MINERAL RESOURCES

APPENDIX VIII - WATERSHED MANAGEMENT

APPENDIX IX - FLOOD CONTROL

APPENDIX X - IRRIGATION AND DRAINAGE

APPENDIX XI - MUNICIPAL AND INDUSTRIAL WATER

APPENDIX XII - RECREATION

APPENDIX XIII - FISH AND WILDLIFE

APPENDIX XIV - ELECTRIC POWER

APPENDIX XV - WATER QUALITY, POLLUTION CONTROL, AND HEALTH FACTORS

APPENDIX XVI - SHORELINE PROTECTION AND DEVELOPMENT (NOT APPLICABLE)

APPENDIX XVII - NAVIGATION (NOT APPLICABLE)

APPENDIX XVIII - GENERAL PROGRAM AND ALTERNATIVES

LOWER COLORADO REGION
COMPREHENSIVE FRAMEWORK STUDY

APPENDIX XII

RECREATION

This report of the Lower Colorado Region Framework Study State-Federal Interagency Group was prepared at field-level and presents a framework program for the development and management of the water and related land resources of the Lower Colorado Region. This report is subject to review by the interested Federal agencies at the departmental level, by the Governors of the affected States and by the Water Resources Council prior to its transmittal to the Congress for its consideration.

June 1971

COMPREHENSIVE FRAMEWORK STUDY

LOWER COLORADO REGION

APPENDIX XII

RECREATION

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"I think that when future philosophers scan back through the records of human history and human thought they may put their finger on this century as a time of outstanding advance in man's responsibility to the earth. Whether man can succeed in preserving an attractive and livable world is the problem that lies ahead."

A Starker Leopold

June 1957



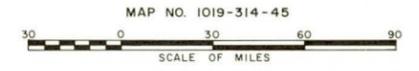
INDEX MAP

EXPLANATION

- Lower Colorado Region boundary
- Subregion boundary
- Lower Main Stem
- Little Colorado
- Gila
- Lower Colorado Basin boundary
- Existing dam and reservoir
- Existing dam and intermittent lake



COMPREHENSIVE FRAMEWORK STUDY
 LOWER COLORADO REGION - HYDROLOGIC
 GENERAL LOCATION MAP



LOWER COLORADO REGION

FACT SHEET

2020 Modified OBE-ERS population projection 6,876,800

(million recreation days)

2020 Total recreation demand 918
 1965 Recreation supply 390
 2020 Total recreation needs 671
 2020 Needs met by framework plan 285
 2020 Needs unmet by framework plan 386
 2020 Amount of total needs that are water-based 138

(acres)

2020 Land acreage needs (includes 2,170,000
 1,874,284 Federal acres shifted from
 low density to high density use)
 2020 Land needs met by framework plan 1,933,548
 2020 Land needs unmet by framework plan 236,000

(acres)

2020 Water surface-acreage needs 125,000
 2020 Water surface-acreage needs met by
 framework plan 40,345
 2020 Water surface-acreage needs unmet
 by framework plan 84,655

(million dollars)

2020 Cost of framework plan met needs \$1,052.0
 2020 Cost of meeting all needs including
 those met by framework plan \$2,545.6

SUMMARY

The Job Ahead

The Appendix considers some of the broad issues and problems which will confront recreation planners in the Lower Colorado Region between 1965 and 2020. The central focus of this study is determining ways of satisfying the 918 million recreation days of annual demand which will be generated by the 6.9 million projected population (developed by the Office of Business Economics and the Economic Research Service, later modified by the Lower Colorado Framework Study staff). Based on 1965 levels of supply, the Region will need an additional 671 million recreation days of development if the demand is to be met. It is significant that approximately 70 percent of this need is considered urban in nature.

Recreation needs are expressed in three ways: development needs in recreation days, additional land acquisition or acreage shifts from low density to high density recreation use, and additional water surface needs. The Gila and Lower Main Stem Subregions have the greatest share of the needs which reflects the location of the Region's three urban centers. The Little Colorado Subregion accounts for the bulk of additional water surface needs while the present supply of water-based recreation opportunities in the Lower Main Stem Subregion are estimated to be adequate through 2020. Class I and Class II lands constitute the entire non-water-based recreation needs; Class III lands constitute a surplus in the Region. The cost of meeting needs will total over \$2.5 billion by 2020 of which \$1.7 billion will be required to satisfy urban needs. Operation, maintenance and replacement costs to support the additional development will approach \$257 million annually.

Unmet Needs

The response of the framework plan to meeting the recreation needs leaves 386 million recreation days of needs unmet by 2020. The job of meeting all recreation needs requires that we review the effectiveness of past policies and challenge those found to be inadequate. The recreation needs are definitely urban-oriented, yet the financial assistance available to local governments remains

deficient. Respective levels of government tend to operate in an exclusive manner; a policy that results in the greatest Federal and State recreation expenditures taking place outside the metropolitan centers. Based on the priorities and conclusions of this study, the continuation of this policy is inconsistent with the future pattern of recreation needs. The Federal government has recognized this need in its new program to bring "parks to people". This is the recreation imperative of the future.

Future Goals

The 1962 Report of the Outdoor Recreation Resources Review Commission gave definitive expression to recreation as a social need and to the provision of recreation opportunities as a proper and necessary function of government. To this end, recreation development has been recognized as a significant national goal, demanding attention along with such other goals as education and health. The goals outlined in the recent National Environmental Policy Act of 1969 underscore the Nation's commitment to improving the quality of life and of the environment. Provision for recreation opportunities is an important part of that effort.

The preservation of important aspects of our natural and cultural heritage also is a significant national goal. The Lower Colorado Region is one of the fastest growing in the country. Its scenic wonders, open space and other natural amenities are being threatened by the development pressures associated with its rapid growth. If these values are to be saved, the existing pattern of uncoordinated settlement and resource development must change. New policies and legislative controls are essential. More importantly, a new ethic emphasizing our responsibility as trustees of the environment for future generations must underlie our planning and decision making.

The Prime Need

The prime need is for a new look at our social, economic and environmental goals. The recent interest in ecology and environmental quality is challenging past assumptions and beliefs. Precedent setting legislation guaranteeing environmental rights has been introduced or enacted in a number of States. An "Environmental Bill of

Rights" has been proposed among members of Congress. A Federal commission on population problems has been created and Federal land use planning and zoning legislation has been introduced. A host of Federal bills have been introduced and some enacted regarding air, land, noise and water pollution. Apparently, a whole new approach to coping with environmental problems is emerging. The Advisory Commission on Arizona's Environment gives voice to some of these problems. Citizens, public officials and State legislators, however, must give greater support to enacting progressive legislation establishing an effective environmental control program.

Most of the effort to date has been concerned with objectives and goals of the States and Nation. In many instances these goals and objectives have not been fully incorporated into the recreation planning field. Currently, programs are largely justified from the viewpoint of their multiple purposes. This approach is integrally tied to the benefit-cost method used to evaluate the desirability of a project, justify its cost and assign it a priority. The multiple purposes of projects, whether freeways, urban renewal, water development or flood control are largely based on economic benefits and oftentimes on only the more obvious economic benefits. Goals, on the other hand, quite often have to do with qualitative and intangible benefits.

The need for open space and desirable patterns of settlement, for instance, are goals that work against certain types of urban expansion and economic development. Water resource projects, highways and other public works frequently result in growth and increasing population. The apparent conflict is real enough, but remains unexpressed. Until open space and environmental goals are definitively identified, they cannot be included in the planning and decision making process. We must undertake to identify our goals and make them an integral part of both our planning and action.

PLAN OF ACTION

The following recommendations collectively comprise a plan of action to meet the recreation needs identified in this study. They are not intended as the ultimate solution to the Region's recreation problems, nor are they suggested as an inflexible means to meet needs. Many of the action items involve changes in present legal and institutional constraints, which if implemented, should greatly alleviate the Region's future recreation needs. Our goal is to insure that quality recreation experiences are available to all people in a setting they can enjoy.

Many of the recommendations are important enough to form the core of an early action program. Plan elements such as land use planning and preservation of unique and irreplaceable natural resources (wilderness, wild and scenic rivers) require immediate attention. The concentration of needs in the Region's three metropolitan areas dictates that these areas be given high priority. The plan of action also highlights areas in which additional study is needed. For the reader's convenience, the action items are referenced to the page number in the text where further information can be found.

RECREATION LAND USE

- Federal Land Use Goals*
(page 31)
1. The first step should be Federal legislation to coordinate and consolidate national land use goals and policies. If goals are identified and policies defined on a nationwide basis, the promulgation of Regional plans will be far simpler. The present lack of goals has led to uncoordinated policy or no policy at all in many instances. Federal assistance should be available for the States to undertake land use planning.
- State Land Use Policy*
(page 37)
2. The projected increase of the Region's population will bring tremendous pressure on the available land resources. Growth should be coordinated on statewide levels through a land use policy formulated under State laws. The policy should consider, among other matters, the following:
 - a. A single State agency with zoning authority and responsibility for preparing a statewide land use plan. Local zoning and land use would be in conformance with this plan.

- b. Permanent open space zones which are designated and protected by law.
- c. Private recreation and scenic preserves established through incentives and other mechanisms.
- d. Liability and comprehensive insurance, underwritten by the State, for those private landowners who make their land available for public recreation use.

PRESERVATION VALUES

Natural resources are irreplaceable when lost. The Recreation Work Group has outlined those resources which it believes should be considered in an early action program for preservation.

*Wild and Scenic
River System
(page 82)*

1. The number of free-flowing streams in the Region has rapidly diminished. The following streams have potential for inclusion in the Wild and Scenic River System under Public Law 90-542 and should be added to the Section 5(d) list. All three classifications (wild, scenic, recreation) of streams are represented. Some of the streams may include more than one classification along different reaches. The Gila River requires priority attention due to impending development plans.

Colorado River - Glen Canyon Dam to Lake Mead and Davis Dam to International Boundry (Particularly Topock Gorge and Imperial Division).

Oak Creek - headwaters to confluence with Verde River.

Verde River - Horseshoe Lake to confluence with West Clear Creek.

Salt River - headwaters to Stewart Mountain Dam

Little Colorado River - Grand Falls to confluence with the Colorado River.

Chevelon Creek

North Fork Diamond Creek

Gila River - headwaters to Florence

Tonto Creek

Black River

White River

East Verde River

Wilderness Areas
(page 83)

2. Many wilderness and primitive areas are identified in the body of the report as having potential for inclusion under The Wilderness Act (Public Law 88-577).

There are also other wilderness possibilities on lands administered by the Bureau of Land Management; however, there is presently no provision for BLM management of wilderness. The Act should be amended to provide a review procedure by which proposals for wilderness on BLM administered lands can be submitted to Congress.

Research Natural Areas
(page 88)

3. In view of the increasing need for ecological information and the necessity for understanding natural processes, there should be Federal legislation establishing a system of research natural areas maintained for scientific, educational and esthetic value. Natural lands, together with the plants and animals living there in natural communities, are of value for scientific research in many fields, including ecology, taxonomy, genetics, forestry, agriculture, geology, geography, soil science and archeology; for the teaching of natural history, conservation and other subjects; as reservoirs of material that may yield new products for medicine, food and industry; as habitat for rare and vanishing species; and as places of historic and natural interest and scenic beauty. Incidental research in nature preserves and visits by the public should only be permitted so as not to modify the natural conditions.

Historic Sites Act
(page 98)

4. Legislation is needed that would extend the coverage of the Historic Sites Act of June 27, 1960 to provide for exploration and salvage of historical and archeological data at all Federal and Federally assisted or licensed projects. The Act currently only covers dam construction; however, historic and archeologic values may be found at any construction site.

MEETING URBAN RECREATION NEEDS

Examination of the projected supply and demand data indicates that the Region's urban areas will experience a tremendous growth in the need for recreation facilities. Because 70 percent of the total Regional recreation requirements are urban-oriented, the burden of satisfying them will fall heavily on local governments which may be financially unable to cope with the problem.

Federal Role

*Federal Role
(page 39)*

1. Management of urban recreation facilities should continue to be a non-Federal responsibility; however, there are Federal lands near population centers where, because of size or unique attributes, these lands can play an important role in meeting urban needs. Examples of areas providing urban recreation include Lake Mead National Recreation Area, national forest lands near urban centers and Federal lands along the Colorado River.

*Federal Surplus
Property
(page 41)*

2. Surplus Federal property in urban areas can provide excellent opportunities for recreation sites. Some Federal agencies might find relocation to be efficient if there were no budgetary penalties which are now imposed on agencies moving from one site to another. These penalties should be removed in cases where the Region would gain valuable recreation lands.

*Federal Recreation
Grant Program
Coordination
(page 42)*

3. Federal grant programs dealing with recreation, beautification and open space should be thoroughly reviewed to determine the feasibility of combining them under one administering authority. Such consolidation appears necessary to provide proper continuity, coordination and efficiency in administration. If such consolidation should prove impractical, then a single agency should at least be authorized to coordinate the granting of all Federal financial assistance to State and local governments for recreation purposes.

*Land and Water
Conservation Fund
(page 44)*

4. The Land and Water Conservation Fund will continue to be the primary source of Federal

financial assistance to State and local governments for outdoor recreation projects. With projected recreation costs reaching \$1.9 billion in the Region by 2020, the fund will need to be greatly expanded to enable State and local governments to meet their recreation commitments.

*Urban Research
Clearinghouse
(page 44)*

5. Research into the plight of the Nation's cities has been rather disjointed and incomplete. Findings in one city may be unavailable to and unknown in another city. An urban recreation division in a non-land managing agency such as the Bureau of Outdoor Recreation could act as a nationwide clearinghouse for urban research, enabling the Region's cities to draw on the knowledge of all the Nation's urban areas.

The State Role

*State Parks
Acreage Limitation
(page 44)*

1. In Arizona, a major shortcoming of the enabling legislation authorizing the acquisition of park land is the 160-acre limitation placed on the size of State recreation sites. The requirement to obtain special authorization from the legislature for sites in excess of 160 acres unduly restricts the Parks Board in carrying out its responsibilities and should be eliminated.

*Freeway Rights-
of-Way
(page 45)*

2. The States should make available to local agencies, where feasible, long term leases at nominal cost for the development of urban parks along, under or above freeway rights-of-way. The proposed Papago Freeway in Phoenix will allow for such development under its elevated portions.

*Restrictions on
State lands
(page 45)*

3. Under existing law, the Arizona State Land Department is directed to seek a maximum dollar return on the sale and lease of State lands. This policy discourages transfer of State land to other State agencies or local jurisdictions for recreation purposes. It is imperative that the legislature seek a better policy for the transfer of those State lands with prime recreation value, particularly where they may serve urban needs, to State agencies and local governments at minimal cost.

Technical Assistance
(page 46)

4. The States should concentrate on providing technical assistance to cities for new and continuing recreation programs. To insure effective implementation of these programs the States should consider establishing a separate division to deal specifically with urban problems such as the following:
 - a. methods of raising funds (such as special taxes on sporting goods) for State grant programs,
 - b. research to determine types of facilities specifically desired by urban recreationists in the different cities of the State,
 - c. development of recreation programs for people with specialized needs such as the physically and mentally handicapped, and the economically disadvantaged, and
 - d. establishment of special funds to assist colleges and universities to expand their research and recreation training programs.

The Local Role in Urban Recreation

Develop Citizen Participation
(page 47)

1. Increased emphasis on citizen participation is an essential part of developing meaningful local programs since total metropolitan areas are composed of pockets of discrete neighborhoods whose residents may have widely differing needs. Recreation is an important part of urban life and programs should reflect a concern for all age groups and all facets of recreation, i.e., cultural, artistic, and creative needs as well as athletic needs. These programs will be most effective when they are tailored to the individual in specific neighborhoods and are administered by properly trained supervisors working with small localized groups.

Sources of Revenue
(page 51)

2. Since local governments often do not have adequate financial resources nor the capability to raise the required capital to meet recreation needs, it is recommended that the States substantially ease present constitutional limitations restricting bonded indebtedness

and property tax rates. Relief from these restrictions is especially critical in Arizona and Nevada.

*Public
Transportation
(page 51)*

3. Location is the most critical factor to consider when acquiring recreation land. The greatest need for parks and facilities is in the Phoenix, Tucson, and Las Vegas metropolitan areas where land costs are very high. If adequate facilities cannot be located where people need them most, then fast, inexpensive public transportation should be provided to bring people to areas where costs allow such development. Public transportation is stressed since many people are too old or too young to drive or simply do not own an automobile. Regional parks such as Maricopa County Park are not within walking distance, which may deprive those without automobiles the opportunity to visit these parks.

*Zoning and
Subdivision
Regulation
(page 52)*

4. Arizona seriously needs adequate enabling legislation for municipal planning and subdivision regulation along with a strengthening of zoning statutes. These tools would allow local governments to require land or in-lieu monies for recreation in new subdivisions and to make greater use of easements and zoning (such as cluster, flood plain and natural resource zoning).

*Joint Use of
Land and Facilities
(page 54)*

5. Agreements between different local agencies for the joint use of land and facilities can help in meeting urban recreation needs. Agreements similar to those for joint-use of school-park facilities can be worked out with agencies involved with freeway and rapid transit rights-of-way, irrigation and flood control districts, public utilities and many others.

*Mobile Recreation
Programs
(page 55)*

6. Since sporadic recreation is considerably better than no recreation at all, temporary equipment for basketball, dances, volleyball, etc., can be provided for use on closed streets, parking lots and other open areas as the need arises.

The Private Role in Urban Recreation

*Planning
Coordination
(page 56)*

1. Private enterprises are generally not profitable

in the recreation field when they must compete with government agencies. This problem can be resolved by planning coordination when the private sector is included in preliminary decision making. This coordination can identify those functions best handled by private interests.

*Incentives for
Private Landowners
(page 57)*

2. The private sector can be a potent force in helping to meet urban recreation needs and open space requirements. There is presently little or no incentive for the private landowner to open his property to public use. The merits of a tax deferral program should be explored where tax relief would be given to landowners allowing public recreation on private property; however, taxes would accumulate and become payable in the event the landowner withdraws the property from public use.

MEETING NEEDS OUTSIDE URBAN AREAS

*Federal Role
(page 58)*

1. Where they have large land and water holdings, the land managing Federal agencies should continue to bear the primary responsibility for providing recreation development. Satisfaction of non-urban recreation demand will require the shifting of 1,874,000 Federally administered acres of multiple purpose use land (Class III) to single purpose recreation use (Class I, II, IV) by 2020.

*Recreation and
Public Purposes
Act
(page 58)*

2. Under provisions of the Recreation and Public Purposes Act, a State, its political subdivisions or a non-profit association may lease at 25¢ per acre per year or buy at \$2.50 per acre Public Domain for recreation purposes. The major deficiency of the Act is the 640-acre annual purchase limitation placed on entities other than the States. This limitation is unrealistic and inappropriate and should be altered to reflect the scale and character of present day recreation needs. Liberalization of the purchase limitation, however, should be accompanied by strengthened planning requirements and a reversionary clause.

*Unique Natural
Areas
(page 60)*

3. Federal agencies managing unique and high quality recreation lands should resist pressures to overdevelop when the result is likely to be degradation of natural values. Construction of visitor facilities outside but adjacent to the threatened area by other Federal, State and local agencies or private enterprise would provide viable alternatives. It is essential that a low level of use be maintained on Class IV and V lands to preserve the quality of the resource.

*Phreatophyte
Eradication
(page 60)*

4. It is of critical importance that Federal and State agencies carefully plan their phreatophyte clearance projects, and other vegetative manipulation programs, to avoid the loss of important ecological, wildlife habitat, scenic and outdoor recreation values.

*State Lands
(page 61)*

5. Additional recreation opportunities should be made available by the Arizona State Land Department requiring grazing lessees of State land to permit public access for hunting, fishing, riding and similar recreation activities.

*Bonded
Indebtedness
(page 62)*

6. Bond act borrowing is an essential means of financing recreation programs and developments. However, the State of Arizona has a \$350,000 bonded indebtedness limitation. This constitutional provision, limiting general obligation bonds, would require that any State bond issue be self-liquidating revenue bonds. In order to use bond financing for other than self-sustaining projects (marinas, ski tows, etc.), the present bonded indebtedness ceiling must be raised significantly.

In Nevada, extremely conservative policies resulting in limited "pay-as-you-go" allocations by State and local jurisdictions have caused facility development to lag far behind public needs. As the Nevada State Outdoor Recreation Plan makes clear, deficit spending--financing through the sale of bonds--is an essential requirement for a successful long-range capital improvement program aimed at developing the State's recreation potential.

*Local Bonded
Indebtedness
(page 62)*

7. Local governments in Arizona and Nevada have constitutional limitations placed on their indebtedness, which are tied to the assessed value of their taxable property. These limitations should be substantially eased in order to allow local governments to make even greater use of their general obligation bonding authority.

*Private Sector
(page 63)*

8. The involvement of the private sector in meeting recreation needs should be encouraged. New and emerging forms of recreation such as sky-diving, off-road vehicles and travel caravans offer challenging avenues for private investment. Some form of public assurance or financial incentive should be provided to induce private investors into recreation ventures.

*Indian
Reservations
(page 65)*

9. Indian reservations offer outstanding opportunities for long term private investment and concessionaire operation in many non-urban outdoor recreation activities. Development by the Indian Tribes or lessees should be strongly encouraged.

*National Recreation
Trails
System
(page 90)*

10. A shortcoming of the National Recreation Trails System is the lack of inducement for local entity participation. The program would be considerably strengthened by amending the National Trails System Act (Public Law 90-543) to provide acquisition, development and maintenance funds. The System would also benefit from inclusion of the right of eminent domain for acquiring rights-of-way across private lands.

*Scenic Highways
and Parkways
(page 93)*

11. Driving for pleasure and sight-seeing are the Region's most popular recreation activities. Scenic parkways such as the Coronado Trail (U.S. Highway 666) can provide opportunities for leisurely paced motoring. State parkway programs can be enhanced through the following considerations:
 - a. the use of easements, eminent domain, or tax incentives to private landowners to limit development along scenic stretches of road,

- b. controlling advertising billboards, possibly by providing advertising kiosks at rest stops where the traveler can be informed of local services, and
- c. careful coordination with public utilities to place transmission lines so as not to interfere with the view from scenic highways.

WATER - A KEY ELEMENT

*Single Purpose
Recreation
Reservoirs
(page 68)*

1. The Gila Subregion generates 55 percent of the water-based recreation demand while 74 percent of the supply is in the Lower Main Stem Subregion. There is also an uneven distribution of recreational waters within the Gila Subregion in relation to the urban centers of Phoenix and Tucson; however, the Central Arizona Project will help to meet these water-based needs generated from the cities. Before recreation benefits are attributed to new projects in remote areas (more than a two hour drive from the cities), the possibility of providing more water-oriented recreation opportunities near Phoenix and Tucson should be explored. Single purpose recreation reservoirs may be one means of providing water recreation in or near urban areas.

*Federal Water
Project Recreation
Act
(page 68)*

2. The Federal Water Project Recreation Act (Public Law 89-72) requires non-Federal agencies to share 50 percent of the cost of recreation enhancement features at new Federal water projects. The Act would be considerably strengthened by amendment to include the following considerations:
 - a. implementation of a sliding scale of Federal participation from 0 - 100% based on environmental considerations or degree of recreation needs in the project area,
 - b. provision for the 10 year time limit on land retention to be extended to the life of the project so that the recreation resource will be available in future years

when needs may be more pressing, and

- c. increasing the \$100,000 Federal cost-sharing limit on existing Bureau of Reclamation projects.

*Existing Lakes
and Reservoirs
(page 70)*

3. Existing lakes and reservoirs offer prime potential for satisfying water-based recreation needs. Opportunities at lakes and reservoirs are limited mainly by the adequacy of shore facilities. Additional access points are needed at reservoirs such as Lake Mead to fully utilize their recreation potential.

*Canals and
Diversions
(page 74)*

4. Canals and diversions can provide recreation opportunities in water short areas; however, liability, pollution and structural problems tend to discourage owners from allowing public recreation on these properties. By providing legal protection to the owner and supervision and safety for the user, more could be made available.

*Management
Practices
(page 77)*

5. Better management practices, improved facilities and pollution control are as important as the provision of additional water acreage. The following techniques should be given consideration in the Lower Colorado Region:

- a. provision of large public swimming pools in high need urban areas.
- b. construction of two smaller "tandem" reservoirs rather than one large one where erratic drawdowns or high seasonal water fluctuations would detract from the recreation experience. The lower impoundment could be maintained at a constant level at the expense of severe water level fluctuations at the upper reservoir.
- c. reclaimed water from sewage treatment may be too saline for domestic purposes, but could serve recreation uses such as golf course irrigation, and small recreation lakes and pools.

*Rio Salado
Project
(page 72)*

6. Opportunities for preserving waterways as open space in the Region's urban areas should

receive priority attention. The Rio Salado project in Phoenix would provide a greenbelt which would serve to unify the neighborhoods of the community.

*Non-Structural
Measures in
Flood Plain
Management
(page 34)*

7. The financial burden of implementing non-structural measures in flood plain management presently falls on local government while structural measures qualify for Federal assistance. Federal assistance should be given for non-structural measures (especially land acquisition) where it would be more scenic and/or less expensive to control floods by preserving undeveloped flood plain. Federal assistance for non-structural measures would enable local government to formulate their flood control programs on a basis of land use planning rather than relying primarily on local financial considerations.

*Flood Plain
Management
(page 36)*

8. Federal, State and local guidelines should be developed and coordinated to establish environmental values associated with the development or preservation of streams near urban areas and flood plains. At present, the selection between development alternatives is limited because of existing institutional and funding arrangements. The following questions require study and hopefully resolution:
 - a. to what extent and for what purposes should the Federal government purchase land and/or development rights, especially along flood plains for the purpose of preserving open space?
 - b. to what extent should enhancement of environmental values be included as a project purpose?
 - c. to what extent should the costs involved with such environmental measures be shared between Federal and non-Federal interests?
 - d. should mitigation of damages to recreation and environmental values be considered as a project cost, as is now the case for fish and wildlife resources?

ADDITIONAL STUDY REQUIRED

The Recreation Work Group encountered many problems in this study which were beyond their ability to solve or for which the proper knowledge and tools were not available. The following recommendations should receive immediate consideration because of the time required to reach conclusions in research work.

Environmental Considerations

1. A systematic approach to quantifying environmental considerations must be developed and perfected so that the effects of a project can be compared in a meaningful way to tangible economic benefits of a project.

Recreation Land Classification System

2. The recreation land classification system and the techniques for measuring recreation use and user preference must be re-evaluated and improved. Once formulated, the improved system should be used in common by all recreation land managing agencies in compiling statistical data. Further work is needed to identify the most useful ways to store and disseminate recreation data.

Urban Areas

3. The three urban centers of the Region (Las Vegas, Phoenix and Tucson) require additional detailed study to determine specific projects to satisfy their growing recreation needs. More relevant research is needed to determine exactly what these urban residents' needs are.

Off-Road Vehicles

4. The Lower Colorado Region is becoming a very popular area for off-road vehicle use, both by residents and tourists. Means for accommodating this new recreational activity without adversely affecting the fragile desert environment must be found.

Carrying Capacity of Land

5. More precise data are needed on the carrying capacities of each recreation land class and the relationship of varying geographic areas and recreation activities to the capacity.

Table of Contents

	<u>Page</u>
SUMMARY	i
PLAN OF ACTION	iv
CHAPTER A - INTRODUCTION	XII-1
Authority	1
Purpose	1
Scope	1
Relationship of Recreation Appendix to Other Appendixes	2
CHAPTER B - REGIONAL SETTING	3
Lower Main Stem Subregion	4
Gila Subregion	4
Little Colorado Subregion	5
CHAPTER C - PRESENT INADEQUACIES AND THE FUTURE OUTLOOK	7
The Situation Today	7
Recreation Land Classes	9
Capacity of the Resource	10
Location of the Resource	12
Demand--A Function of Population	13
Recreation Needs--A Broad View	17
The Social Dimension	18
Considerations	19
CHAPTER D - PLAN FORMULATION	23
Planning Objectives	23
Alternative Population Projections	23
Alternative Means to Satisfy Needs	24
Social Constraints	25
Physical Constraints	28
Institutional, Financial and Political Constraints	28
CHAPTER E - THE JOB AHEAD	31
Changing Concepts of Resource Use	31

	<u>Page</u>
The Case for Open Space	XII-32
Use of the Flood Plain - Greenbelts	33
Flood Plain Management	34
Protecting Open Space Values Along Flood Plains	36
A State Program	37
A Program for Meeting Recreation Needs	38
Meeting Urban Needs	38
The Federal Role in Meeting Urban Needs	39
Land Management and Surplus Property	39
Federal Financial Assistance	42
Research and Technical Assistance	44
The State Role in Meeting Urban Needs	44
Land Management	44
State Surplus Property	45
State Financial and Technical Assistance	46
The Local Role in Meeting Urban Needs	47
Recreation Programs	47
Local Financial Commitment in Meeting	
Urban Needs	50
Acquiring the Recreation Resource	51
Multiple Use, Under Use and Potential Use	54
The Private Role in Meeting Urban Needs	56
Organizations and Clubs	56
Commercial Enterprise	56
Private Open Space Opportunities	57
Meeting Needs Outside Urban Areas	58
The Federal Role	58
The State Role in Meeting Needs Outside	
Urban Areas	60
The Private Role in Meeting Needs Outside	
Urban Areas	63
Indian Reservations	65

	<u>Page</u>
Needs for Unique Natural, Primitive and Cultural Areas	XII-66
Water - A Key Element	66
Federal Water Project Recreation Act	68
Existing Lakes and Reservoirs	70
Recreation Reservoirs	71
Presently Authorized Projects	72
Waterway Recreation	72
Public Swimming Pools	74
New Management Techniques	77
Recreation Use of Reclaimed Water	78
Special Areas and Needs	79
Natural Values	80
Wild and Scenic Rivers	82
Wilderness Values	83
National Registry of Natural Landmarks	87
Research Natural Areas	88
Special Management Areas with Exceptional Values	90
Scenic and Recreation Trails	90
Scenic Highways	93
Rare and Endangered Species	96
Cultural Values	98
Archeology	98
History	100
ADDENDUM	XII-A-1
Definitions	A-1
Recreation Land Classification System	A-4
Programs of Public Agencies and Private Interests	A-8
Federal Recreation Programs	A-8
Department of the Interior	A-8
National Park Service	A-8
Bureau of Land Management	A-9
Bureau of Sport Fisheries and Wildlife	A-10
Bureau of Reclamation	A-11
Bureau of Outdoor Recreation	A-11

	<u>Page</u>
Bureau of Indian Affairs	XII-A-11
Department of Agriculture	A-12
Forest Service	A-12
Soil Conservation Service	A-12
Farmers Home Administration	A-13
Department of Defense	A-14
Army Corps of Engineers	A-14
Federal Power Commission	A-15
State Recreation Program	A-15
State Organizations	A-15
City and County Recreation Programs	A-21
The Private Role	A-21
Bibliography	A-23
Study Procedures	A-27
Supply of Outdoor Recreation Areas	A-27
Existing Areas	A-27
Acreage Capacity	A-27
Recreation Demand	A-28
Assumptions	A-28
Estimating Base Year (1965) Demand	A-29
Projecting Demand to Target Years (1980, 2000, 2020)	A-31
Summary	A-32
Recreation Needs	A-32
Resource Requirements	A-32
Cost Estimates	A-34
Class I	A-34
Class II	A-35
Statistical Tables	
Modified OBE-ERS Plan	A-36
OBE-ERS Plan	A-55

List of Maps

	<u>Following Page</u>
1. Lower Colorado Region, General Location Map	Frontispiece
2. Lower Colorado Region, Land Ownership & Administration	XII-4
3. Lower Colorado Region, Special Areas	80
4. Hiking & Riding Trails, Central portion of Maricopa County, Arizona	91

List of Tables

	<u>Page</u>
1. Recreation Lands - 1965	XII-7
2. 1965 Recreation Water Supply	9
3. Percentage of Total Acreage in each Land Class Compared to Percentage of Total Capacity it Provides	12
4. Selected Activities Used in Estimating Recreation Demand	14
5. Population Projections	24
6. Effects of Planned Response to Satisfying Recreation Needs (Alternative I)	26
7. Estimated Costs of Planned Response to Satisfying Recreation Needs (Alternative I)	27
8. Estimated Costs of Satisfying Total Recreation Needs (Alternative II)	27
9. Major Federal Aid Programs Utilized for Parks and Recreation Purposes	43
10. Outline of State Organizations and Recreation Functions	A-17-A-20
Statistical Tables in Addendum	
A-1 - A-19 Modified OBE-ERS Plan	A-36-A-54
A-20 - A-34 OBE-ERS Plan	A-55-A-70

List of Figures

	<u>Page</u>
1. Percent of Total Recreation Land Ownership by Level of Administration	XII-8
2. Percent of Total Demand by Land Class (1965)	11
3. Total Demand and Water-Based Demand by Target Year and Subregion	16
4. Total Regional Needs for Class I and Class II Lands	20
5. Water Acreage Needs	21

INTRODUCTION

CHAPTER A - INTRODUCTION

AUTHORITY

The Recreation Appendix is part of the Lower Colorado Comprehensive Framework Study, which is one of 18 framework studies covering the major river basins in the United States. The studies were undertaken at the request of the President in response to recommendations of the Senate Select Committee on National Water Resources. The basic objective of this study is to provide a broad guide to the best use, or combination of uses, of water and related land resources of the region to meet foreseeable short and long-term needs. Consideration is given to (a) the timely development and management of these resources as essential aids to the economic development and growth of the region; (b) the preservation of resources, in appropriate instances, to insure that they will be available for their best use as needed; and (c) the well-being of all of the people as the overriding determinant in such planning.

PURPOSE

The basic purpose of the Recreation Appendix is to provide a general framework plan, based on the Modified OBE-ERS Projections, for the use of water and related land resources to meet expected future recreation needs. Specifically, the outdoor recreation portion of the study seeks to: (1) inventory existing available land and water suitable for outdoor recreation, (2) assess the present capacity of the existing recreation resource and future demand, (3) identify future needs and goals for providing adequate recreational opportunities to the year 2020, (4) identify preservation values and (5) recommend a plan of action or programs for increasing present and future resource capabilities for satisfying recreation requirements. The plan will highlight possible conflicts among other water and land uses with recreation. The harmonious resolution of as many of these conflicts as possible should lead to the logical and coordinated development of water and related land resources in the Region.

SCOPE

The scope of the recreation study is limited in detail to that necessary for determining general needs in terms of development of land and water acreage. Both public and private management programs are examined to determine the most efficient and beneficial use of the

recreation resources. Although the Appendix identifies patterns of demand, supply and needs, individual recreation activities are not treated in detail.

The main thrust of the Appendix has been to measure the adequacy of the resource at present levels of development to meet future demand, based on two sets of population projections as described under "Plan Formulation". Each land and water managing agency provided information relating to the present and future capacity of the resource. Comparison of the present supply with future target year demand yielded an indication of the unsatisfied needs if these existed. The additional acreage requirements were then derived from that expression of need. Also these needs were expressed in terms of dollar expenditures required for acquisition and development of lands and facilities. In addition to this quantitative measure of resource needs, the quality and distribution of the existing resources were considered as they affected unmet needs. Alternatives to acreage acquisitions to satisfy needs were also considered where possible and appropriate.

RELATIONSHIP OF RECREATION APPENDIX TO OTHER APPENDIXES

Data gathered for the Recreation Appendix are also relevant to certain other appendixes in the Framework Study. The Land Resources and Use Appendix is probably the most closely related. Statistics on both the existing supply of recreation areas and future acreage needs were provided for use in that appendix by the Recreation Work Group. This information was required to assess the Region's capability to meet all future land use demands. The same data were provided to the General Programs and Alternatives Work Group for their use in formulating the Regional Plan. Of special interest to that group was information having an impact on the potential for meeting other resource needs. Proposed wild, scenic and recreation rivers, for instance, are in conflict with certain proposals for water supply, power and flood control. Many of the recommendations for both new legislation and amendments to existing legislation in the Recreation Appendix were provided to the Legal and Institutional Work Group for use in preparing their recommendations. While fishing and hunting were considered in this Appendix as part of the total mix of recreation activities, the costs of habitat acquisition and maintenance and fish and wildlife management are not included. The Fish and Wildlife Appendix treats these types of programs in detail.

REGIONAL SETTING

CHAPTER B - REGIONAL SETTING

The geographic location, natural environment, history and climate of the Lower Colorado Region represent a set of unique conditions, and it is essential that the interrelationships between these conditions and outdoor recreation be documented before proceeding with actual analysis of recreation supply, demand and need. Documentation is undertaken in two parts. The first deals with the Region as a whole; the second is on a Subregional basis.

The Lower Colorado Region has much to offer the outdoor recreationist. Vistas are broad and open. The Region's natural and historical features have already become recreation destinations for both national and international travelers. Grand Canyon and Zion National Parks, Hoover Dam, the Navajo and Apache Indian reservations, the town of Tombstone, Arizona and an almost legendary winter climate are just a few of the popularly known attractions of the Lower Colorado Region. Equally important, but perhaps less publicized, are the features of the land itself.

Although the desert stretches over large portions of the Region, every life zone from the lower Sonoran to the Alpine is represented. Creosote bush, palo verde, sagebrush and cacti predominate in the desert. The majestic saguaro, which produces Arizona's State flower, is a cactus which may attain heights of 40 to 50 feet. In the spring the desert plants offer a scenic vista which tends to belie the "barrenness" of the desert. Short grass and forbs provide forage for range animals in the grassland areas. Pinon-juniper and chaparral found at intermediate elevations give way to stands of pine or fir at the higher elevations.

The fauna of the Lower Colorado Region include a large variety of game and non-game animals, many of which are unique to southwestern United States. Species number well into the hundreds and include mammals, fishes, amphibians, birds and reptiles. Sizes range from big game animals like the elk and bison to tiny reptiles. See the Fish and Wildlife Appendix for further information about the Region's wildlife.

The public sector accounts for 64 percent of the land ownership in the Region. An additional 17 percent of the area is administered as Indian Trust Lands while the remaining 19 percent comes under the private sector. Map 2 (following page XII-4) shows the ownership pattern relative to each Federal agency responsible for administering the land.

LOWER MAIN STEM SUBREGION

The Lower Main Stem Subregion, extends 600 miles along the entire western border of the Region. Elevations vary from 75 to 11,680 feet, progressing from low desert to above timberline. This progression has important implications for outdoor recreation, most of which are the direct result of climatic variations.

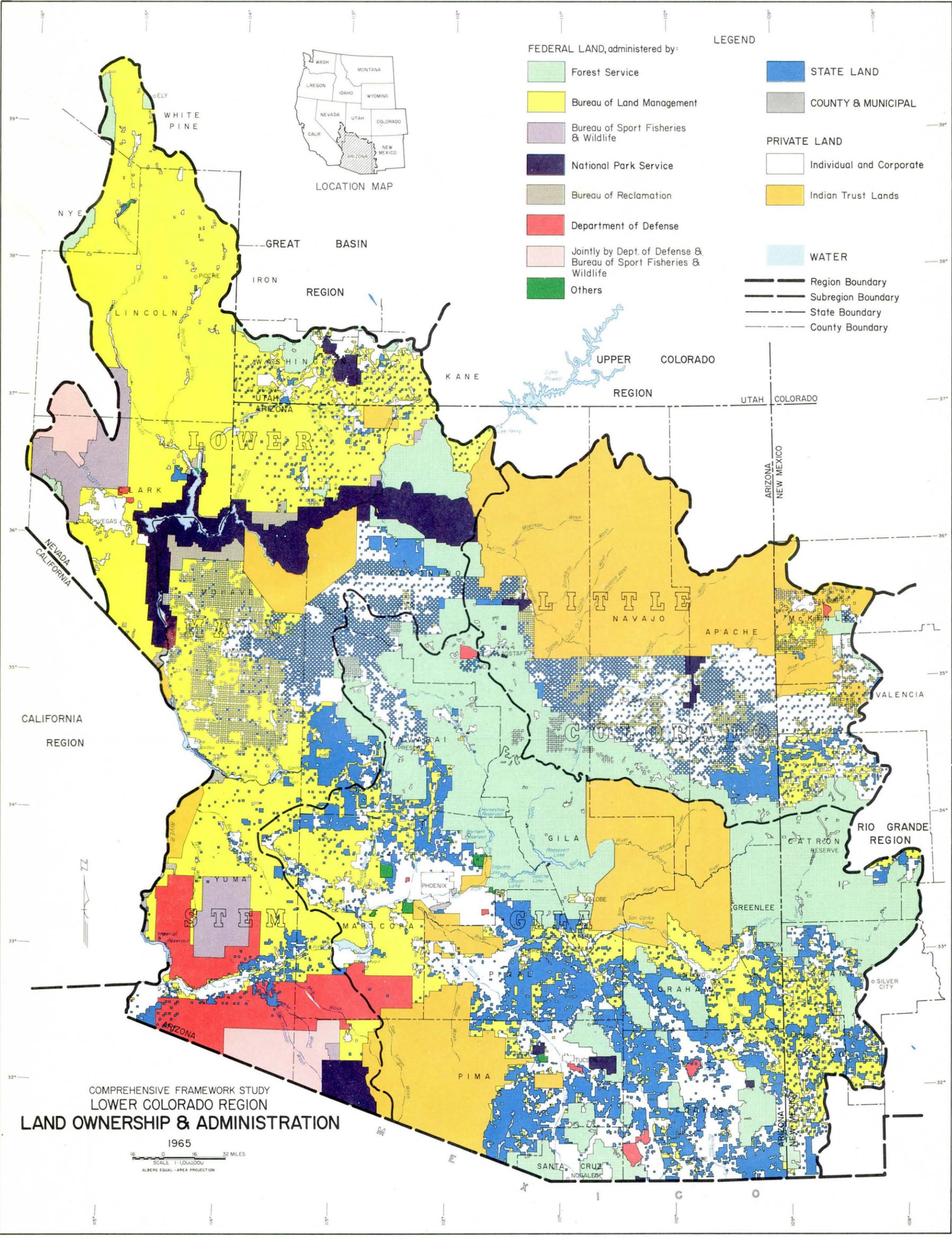
Summer temperatures in the southern portion of the Subregion, consistently in excess of 100° F., limit daytime outdoor recreation. Water-oriented activities such as fishing, water-skiing, swimming, boating and camping dominate the scene because the extensive reservoir and river system offers a measure of relief. In winter, the heat is pleasantly tempered and provides perfect weather for outdoor recreation activities. The Colorado River is the Subregion's main source of water and supports several major reservoirs, the largest of which is Lake Mead. The reservoirs provide excellent water-oriented recreation opportunities on a year-round basis. Seventy-four percent of the Region's total water surface is located in the Lower Main Stem Subregion.

The northern portion of the Subregion is mountainous, rugged and climatically milder in summer, encouraging heavy participation in outdoor recreation activities. Weather during the winter is cool with significant snowfall in certain areas, and at the higher elevations providing sufficient snowfall for development and maintenance of winter sport areas.

Among its scenic attributes, the Lower Main Stem Subregion contains two in particular. Grand Canyon, perhaps nature's most spectacular river gorge, is directly upstream from one of man's most triumphant engineering achievements, Hoover Dam, behind which is Lake Mead. The two offer an excellent commentary on the powers of both nature and man.

GILA SUBREGION

The Gila Subregion of which 65 percent is desert, comprises 40 percent of the Region's total land area. This desert, located in the southern portion of the Subregion, is characterized by many separate mountain ranges which rise abruptly from low desert plains. Desert summers are too hot for many forms of outdoor recreation, especially during midday and in direct sunlight. Activities are, therefore, largely confined to evening hours, to shaded areas or simply to air conditioned buildings. In contrast, the mild winter climate produces ideal conditions for the whole range of outdoor activities and



FEDERAL LAND, administered by:

- Forest Service
- Bureau of Land Management
- Bureau of Sport Fisheries & Wildlife
- National Park Service
- Bureau of Reclamation
- Department of Defense
- Jointly by Dept. of Defense & Bureau of Sport Fisheries & Wildlife
- Others

LEGEND

- STATE LAND
- COUNTY & MUNICIPAL
- PRIVATE LAND**
- Individual and Corporate
- Indian Trust Lands
- WATER
- Region Boundary
- Subregion Boundary
- State Boundary
- County Boundary

LOCATION MAP

COMPREHENSIVE FRAMEWORK STUDY
LOWER COLORADO REGION
LAND OWNERSHIP & ADMINISTRATION

1965

SCALE: 1:100,000
ALBERS EQUAL-AREA PROJECTION

M7-S-21431A-N

attracts a large tourist trade. The primarily urban resident population represents over three-quarters of the Regional total. The influx of tourists from all over the Nation places an additional heavy burden on local facilities. The delicate balance of life in the desert itself is especially susceptible to overuse by the increasing numbers of "off road" recreation vehicles.

Farther north, the scene is quite different--a rugged terrain of high, timbered mountains and deep canyons interspersed with grassy plains and high desert at elevations generally above 5,000 feet going as high as 12,000 feet. Precipitation, here, is the highest in the Region. Summers are relatively mild with cool nights, which is inviting to lower desert residents seeking relief. The combination of topography, vegetation and climate produces a high level of recreation opportunity, particularly for back country types of activities. Recreationists can enjoy an abundance of year-round recreation opportunities since winters are not so cold as to restrict activities to "winter" sports.

LITTLE COLORADO SUBREGION

Topographically, the Little Colorado Subregion is part of the Colorado Plateau Physiographic Province which extends north into Utah and Colorado, and east into New Mexico. The Subregion is characterized by volcanic cinder cones, buttes, badlands, flat-topped mesas and plateaus above 5,000 feet in elevation. It slopes generally from the Mogollon Rim to the Colorado River, forming the Little Colorado River drainage, the principal river system.

Average annual precipitation varies from less than 10 inches, in lower areas along the Little Colorado River, to more than 25 inches near Flagstaff, on the Kaibab Plateau and in places along the Mogollon Rim. Heavy snowfall in parts of the Subregion supports winter sports and contribute spring runoff to the lakes and streams which provide an ideal environment for many water-oriented summer recreation activities.

The most severe climate in the Region is found on the northeastern steppes of the Little Colorado Subregion, where winters are cold, dry and windy and summers are hot. Combinations of the various precipitation and temperature levels produce a wide variety of vegetative types within the Subregion, ranging from those typical of the arid, high desert plains northeast of the Little Colorado to the heavily forested Mogollon Rim and Kaibab Plateau.

Recreation opportunities in the Subregion are closely related to season. There is less participation in outdoor recreation in the winter season. On the other hand, the cool summer climate, mountains and forests attract heavy summer use by residents and non-residents alike. Outstanding scenic features are numerous and Indian cultural attractions are extremely popular with tourists. The Navajo, Zuni and Hopi Indian reservations together account for nearly half of the Subregional land area and enjoy international renown.

PRESENT INADEQUACIES ...

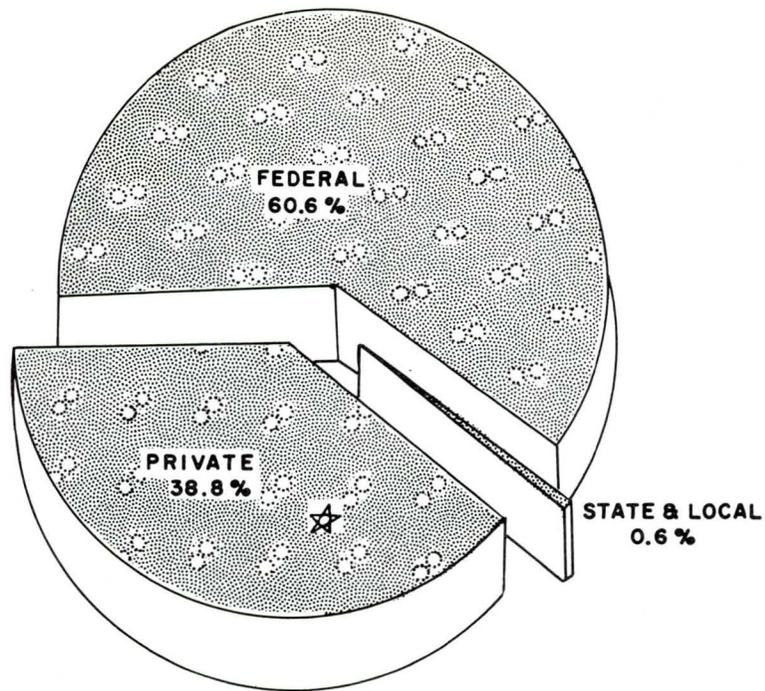
THE FUTURE OUTLOOK

CHAPTER C - PRESENT INADEQUACIES AND THE FUTURE OUTLOOK

THE SITUATION TODAY

The total land area of the Lower Colorado Region amounts to just under 90 million acres. In the 1964 Bureau of Outdoor Recreation inventory of public recreation areas and the more recent National Association of Soil and Water Conservation Districts' inventory of private areas, over 75 percent of the Region was found to be available and/or suitable for recreation (Table I). These recreation lands are either presently available and suitable for public use, presently suitable for recreation use but not available to the public (private ownership, lack of access roads, etc.), or presently available but unsuitable due to a lack of facilities. More than 60 percent of these recreation lands are presently in public ownership, much of it administered under the multiple use concept (Figure 1). In addition, 218,700 surface acres of inland water bodies were inventoried as currently available for recreation use (Table 2).

TABLE 1							Total Available for Recreation
LOWER COLORADO REGION RECREATION LANDS - 1965 (1000 Acres)							
	LAND CLASS						
	I	II	III	IV	V	VI	
Federal	17	191	35,176	2,390	3,269	24	41,067
State		4	213	4	9		230
Local	4	8	51	10	77	1	151
Private	21	17	10,666				10,704
Indian Trust	(Not inventoried by Land Class)						15,550
	Lands Available and/or Suitable for Recreation						67,702
	Lands not Available and/or Suitable for Recreation						22,285
	Total Regional Land						89,987



LOWER COLORADO REGION
 PERCENT OF TOTAL RECREATION LAND OWNERSHIP
 BY LEVEL OF ADMINISTRATION

FIGURE 1

FEDERAL AGENCY RECREATION LAND OWNERSHIP

<u>AGENCY</u>	<u>PERCENT OF TOTAL</u>
BUREAU OF LAND MANAGEMENT	54.5 %
FOREST SERVICE	34.2 %
NATIONAL PARK SERVICE	7.1 %
BUREAU OF SPORT FISHERIES AND WILDLIFE	4.2 %

★ PRIVATE SECTOR INCLUDES INDIAN TRUST LANDS

TABLE 2

1965 RECREATION WATER SUPPLY
LOWER COLORADO REGION

<u>Subregion</u>	<u>Surface acres of water</u>	
Lower Main Stem	162,790	(74.4%)
Gila	45,040	(20.6%)
Little Colorado	10,840	(5.0%)
	<hr/>	<hr/>
Region Total	218,670	(100.0%)

Although at first glance, 75 percent of the Region appears to be an overwhelmingly adequate resource base for recreation, the figure is really quite misleading and deceptive. A more meaningful picture emerges when the resource is classed by its type and level of development, by its location with respect to population centers and by its capacity to serve recreation needs. Indeed, these three elements are the key measures for identifying present inadequacies and determining future recreation needs.

Recreation Land Classes

The system for classifying outdoor recreation resources used in this study was first developed by the Outdoor Recreation Resources Review Commission in its 1962 report to the President. This system, which consists of six broad classes of land, includes the full range of physical resources from high density use to sparsely used extensive primitive areas. A full definition of each class may be found in the Addendum (page XII-A-4). Briefly, each may be described as follows:

- Class I - High Density Recreation Areas
Areas intensively developed and managed for mass use.
- Class II - General Outdoor Recreation Areas
Areas subject to substantial development for a wide variety of specific recreation uses.
- Class III - Natural Environment Areas
Various types of areas that are suitable for recreation in a natural environment and usually in combination with other uses.

Class IV - Unique Natural Areas

Areas of outstanding scenic splendor, natural wonder or scientific importance.

Class V - Primitive Areas

Undisturbed roadless areas characterized by natural wild conditions, including "wilderness areas".

Class VI - Historic and Cultural Sites

Sites of major historic or cultural significance, either local, regional or national.

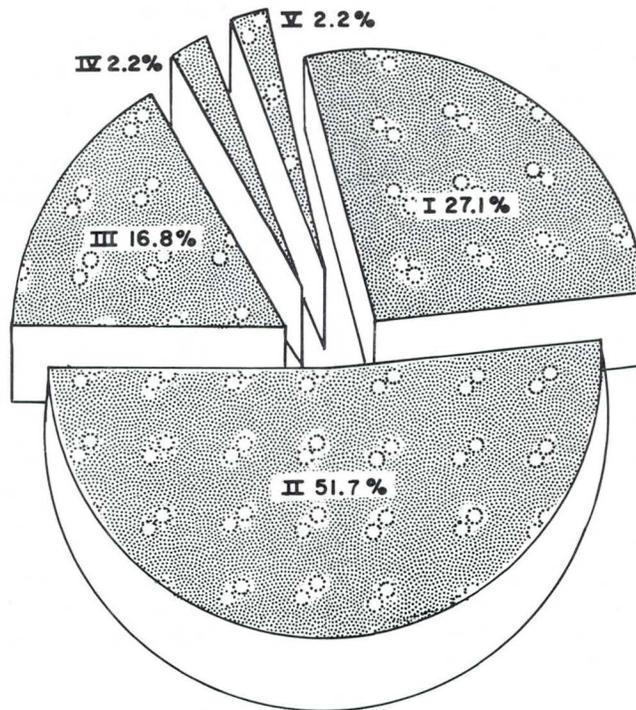
In most cases, an administrative unit, such as a park or forest, would include recreation areas of two or more classes. Although the classification is based largely on physical features, economic and social considerations also play an important part in deciding on the class designation of any given area.

When the different recreation activities are allocated to the most suitable class of land, the significance of the classification system becomes apparent. Playing outdoor games and sports, for instance, is primarily a Class I activity. Hunting and fishing, on the other hand, largely take place on Class III lands. In the Lower Colorado Region, it was determined that 27 percent of the total recreation demand required Class I facilities and opportunities. When added to the share of demand satisfied by Class II recreation areas, fully 79 percent of the Region's demand is accounted for (Figure 2). Since the demand for these classes of land is primarily located in or near metropolitan areas, the heavy emphasis on urban needs and the imbalance of the existing supply in meeting those needs begins to emerge.

This approach does have shortcomings, particularly with regard to urban recreation areas. There should be some way, for instance, of distinguishing the different kinds of very specialized Class I urban recreation areas from each other and from other Class I areas in rural parts of the Region. Another problem involves the different interpretations given land class definitions by the many people making the original surveys.

Capacity of the Resource

The critical element in estimating future needs is the capacity of the existing resource to meet those needs. Each class of recreation land has a different ideal capacity. Factors such as length of season, ability of the resource to sustain use without adverse effect and the quality of the experience, as well as the life style characteristics of the users, all influence the optimum capacity of the resource. A primitive area, for instance, cannot provide the same



LOWER COLORADO REGION
 PERCENT OF TOTAL DEMAND BY LAND CLASS (1965)
 (Modified OBE - ERS)
 Figure 2

RECREATION DEMAND BY LAND CLASS (THOUSANDS OF RECREATION DAYS)

<u>TARGET YEAR</u>	<u>CLASS I</u>	<u>CLASS II</u>	<u>CLASS III</u>	<u>CLASS IV</u>	<u>CLASS V</u>
1965	37,410	71,550	23,178	3,023	3,023
1980	79,027	133,891	43,374	5,657	5,658
2000	179,841	282,478	75,468	11,936	11,936
2020	305,712	434,426	140,729	18,356	18,356

level of use as a playground. Similarly, the desert is a fragile landscape with less capacity per acre than the intensively used ski slopes near Las Vegas, Nevada and Flagstaff, Arizona.

Research relating to the measurement of resource capacity is only just beginning and was not available for use in this study. Further research into the capacity of different recreation areas is vitally needed. Certainly, such information would provide a better basis for estimating needs than the current practice of using standards of so many acres of this or that kind of park for every 1,000 people.

In this study each participating agency with recreation resources was asked to estimate the capacity of its lands and waters based on present levels of development. Ideal capacity figures were used for lands administered by local units of government. The importance of capacity in estimating future needs is illustrated by Table 3 where it is seen that 24.9% of the total recreation days of opportunity are satisfied on .4% of the land (Class I and Class II combined). Private and Indian Trust Lands were arbitrarily considered to have satisfied a certain percentage of demand (See Addendum page XII-A-33).

TABLE 3

1965 LOWER COLORADO REGION RECREATION SUPPLY
 PERCENTAGE OF TOTAL ACREAGE IN EACH LAND CLASS
 COMPARED TO PERCENTAGE OF TOTAL CAPACITY IT PROVIDES

	<u>Land Area</u> ^{1/}	<u>Capacity</u>
Class I	.1	9.3
Class II	.3	15.6
Class III	91.0	72.0
Class IV	3.6	2.9
Class V	<u>5.0</u>	<u>.2</u>
	100.0%	100.0%

^{1/} Indian Trust Lands are considered as
 Class III areas

Location of the Resource

According to the Arizona Plan for Outdoor Recreation an average of 75 percent of the resident demand for Phoenix and Tucson was satisfied within 100 miles of home. (It was assumed this pattern also holds true for Las Vegas.) This pattern of demand, more than any other single factor, is the key to understanding recreation in the

Lower Colorado Region. The heavy recreation use at such areas as Lake Mead, the Tonto and the Coronado National Forests reflects the impact of location adjacent to metropolitan areas. The Region is indeed fortunate in having such opportunities so easily available. Nevertheless, a great deal of recreation development and opportunities are located remote from urban centers. In many ways, residents of the Lower Colorado Region are accustomed to traveling greater distances for recreation than elsewhere. This is particularly the case in summer, when escaping the desert heat is important. The high Mogollon Rim country with its cooler weather is then most attractive.

Given the mobility of people in the Region, the relative availability of resources near the major cities and the desire of residents to travel farther in search of relief from the summer heat, there yet remains an argument for concentrating future development in and around cities. This is the inevitable result of existing work and leisure time budgets, which limit travel time to recreation resources. It is also a function of the types of activities most popular with the Region's residents. Playing outdoor games and sports, for instance, is most often pursued in the cities. Similarly, it is known that the cities are deficient in the supply of recreation areas designed for children under 12. Further, there are whole segments of society, including the urban disadvantaged, who find it impossible to travel long distances for recreation.

For these reasons, among others, there is an imbalance in the supply of recreation resources in the Region. The residents of Arizona and Nevada will continue to seek recreation opportunities in those parts of the Region that are least able to meet their needs. Until the present arrangements of work and leisure time schedule changes significantly, this pattern of recreation demand will continue.

DEMAND--A FUNCTION OF POPULATION

Demand for recreation is quite difficult to measure. Population is presently the best indicator available for planning purposes. A weakness is that it cannot reflect changing cultural patterns of use, but it does provide general trend data. As explained in the addendum section "Study Procedures", demand is based primarily on historical trends of participation in selected recreation activities. The basic source for these participation rates was the Outdoor Recreation Resources Review Commission Study Report No. 19. This information was modified and used by the Arizona Outdoor Recreation Coordinating Commission as a basis for estimating Arizona's demand in their report A Plan for Outdoor Recreation in Arizona. For purposes of this study it was assumed that the participation rates prepared by the State of

TABLE 4

LOWER COLORADO REGION

SELECTED ACTIVITIES USED IN
ESTIMATING RECREATION DEMAND ^{1/}

<u>Activity</u>	<u>Annual Per Capita Rate of Use (1965)</u> (Participation Days)
Playing Outdoor Games, etc.	16.02
Swimming	8.40
Bicycling	4.80
Picnicking	4.43
Attending ^{2/} Outdoor Sports Events	4.33
Fishing ^{2/}	3.99
Nature Walks	3.03
Camping	2.10
Horseback Riding	1.99
Boating other than Sailing, Canoeing	1.85
Hunting ^{2/}	1.12
Hiking	0.81
Water-Skiing	0.69
Miscellaneous	0.65
Attending Outdoor Concerts, etc.	0.52
Sailing and Canoeing	0.26
Sledding or Tobogganing	0.12
Mountain Climbing	0.10
Ice Skating	0.07
Snow Skiing	0.04
	<hr/> 55.32

^{1/} Arizona Outdoor Recreation Coordinating Commission, A Plan for Outdoor Recreation, prepared by Earle V. Miller, Engineers, Phoenix, Arizona, June 1967, p. 3-61.

^{2/} Hunting and fishing are considered only as part of the total mix of outdoor recreation activities. Needs for habitat acquisition and maintenance, and fish and wildlife management are not included. These needs are discussed in the Fish and Wildlife Appendix.

Arizona also would apply to the remainder of the Lower Colorado Region. The selected activities are listed in Table 4 with 1965 participation rates.

Driving for pleasure, sight-seeing and walking for pleasure were not included in the recreation demand analysis. Although the demand for these three activities is almost equal to the combined demand for all the other listed activities, the resource requirements and recreation development requirements to satisfy these activities could not be adequately measured. Resource and development requirements for the three activities might better be expressed in miles of highway, or numbers of parking spaces, rather than in acres of resource. This Appendix does consider needs for driving for pleasure, sight-seeing and walking for pleasure in a qualitative sense, within the Scenic and Recreation Trails and Scenic Highways discussion on pages 90 to 96.

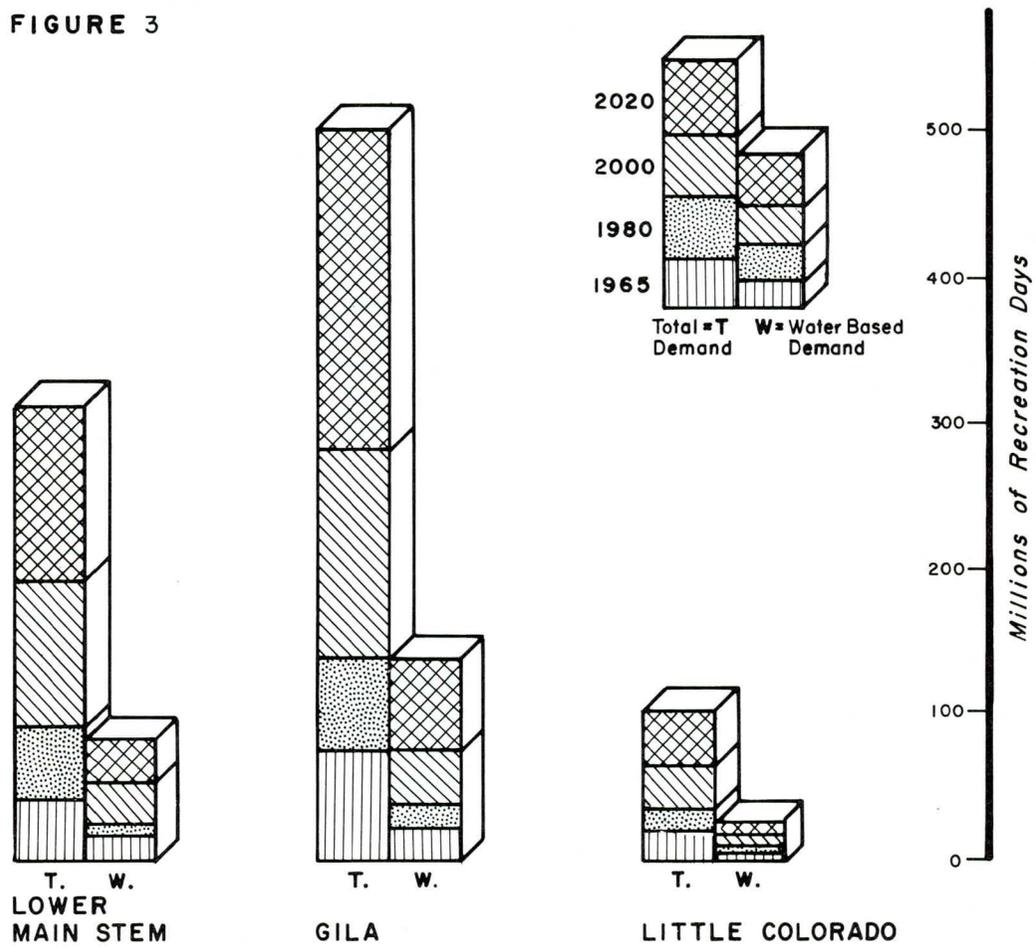
Certainly, recreation, even if limited to outdoor activities, involves more than these 20 activities. But there are no surveys indicating the magnitude or role of other activities for which facilities should be provided. Special programs for the aged, pre-school children, handicapped or specialized activities in arts and crafts, after school enrichment or other socially-oriented recreation programs, for instance, could not be considered. Nor could such highly specialized activities as sky diving, racing dune buggies, bird watching, rock hounding, recreation flying or others. Without doubt, the total demand and the role of urban areas in meeting needs, would have been even larger if the full range of activities were considered.

The per capita participation rates for each of the selected activities formed the basis for estimating present and projected future demand. A mix of activities was projected rather than each of the individual activities because of the uncertainty of the future relationship of one activity to the other. Different factors were applied to each target year demand calculation, to allow for variables such as increasing leisure time, greater mobility, more disposable income, population shifts and increased life expectancy. It is reasonable to assume that the future recreation demand for the Region is conservative, since latent or unexpressed demand was not measured adequately in the study.

In any case, the Lower Colorado Region promises to continue its amazing growth in the demand for recreation opportunities. As Figure 3 shows, the distribution of population will continue to be the dominant factor in shaping the pattern of demand. The Gila and Lower Main Stem Subregions, with their large metropolitan areas, accounted for over 86 percent of the total Regional demand in 1965. Their relative importance will be even greater in the future. In terms of

LOWER COLORADO REGION
 TOTAL DEMAND AND WATER BASED DEMAND
 BY TARGET YEAR AND SUBREGION
 (Modified OBE-ERS)

FIGURE 3



the impact of population centers on other areas, the Phoenix, Las Vegas and Tucson Standard Metropolitan Statistical Areas generated some 73 percent of the total 1965 resident recreation demand.

For the Region as a whole, water-based recreation demand comprises 27.5 percent of the total. Activities considered are only those that actually require water for participation and include swimming, boating, sailing, canoeing, fishing and water-skiing. Many other activities are considerably enhanced by the presence of water. One difficult problem which exists in the Lower Colorado Region is that 55 percent of the water-based demand is generated from the Gila Subregion, while 74 percent of the supply is located in the Lower Main Stem Subregion.

RECREATION NEEDS--A BROAD VIEW

Recreation needs have been rather narrowly defined as the development of necessary facilities and the additional acres of land and water needed to satisfy future demand. From a broader viewpoint, there are many other needs--many of which have to do with such intangible things as attitudes and institutional restraints. Probably the finest statement with a broad perspective is contained in Public Law 91-190, the National Environmental Policy Act of 1969. Although the Act is concerned with many environmental issues besides recreation, it is worth quoting here, for it is as applicable to a discussion of recreation needs as any other environmental problem:

"It is the continuing responsibility of the Federal government to use all practicable means consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs and resources to the end that the Nation may--

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. assure for all Americans safe, healthful, productive and esthetically and culturally pleasing surroundings;
3. attain the widest range of beneficial uses of the environment without degradation, risk to health or safety or other undesirable and unintended consequences;
4. preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment which supports diversity and variety of individual choice;

5. achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
6. enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources."

The Social Dimension

Perspectives of the nature of the recreation environment have changed with our increasing social awareness. In particular, we have come to recognize recreation as an essential human need in a complex and troublesome age. From this point of view, recreation is not simply a luxury of leisure, but a requirement for well-being and social stability. In attempting to fulfill this need, demands on all levels of government have assumed a new direction and urgency. The implications of this social responsibility perception have been lacking. Almost 75 percent of the Region's population lives in urban areas. The effectiveness of our recreation programs can only be measured by how well they serve the needs of these areas. We are now beginning to perceive that these needs are far more diverse and demanding than previously thought.

How men choose to use their leisure depends on an intricate and obscure complex of motives. For the most part, recreation research has been related to problems of resource management, which primarily utilize economic and biological disciplines. Economics and biology have little to say about such motives, which in the distribution of scientific fields, belong rather to psychology and sociology. Neither psychology nor sociology nor any other science, however, has yet answered a high proportion of the possible questions touching upon recreation needs. Inevitably, in trying to cope with recreation problems, we are always thrown back upon other kinds of knowledge. Basically, these have amounted to a collection of perceptions and observations, rules of thumb, common sense, traditions, institutions, speculations, values and conventions.

In spite of the lack of knowledge, we must manage our resources to meet a variety of environmental and social needs. On the whole, cities are most likely to be aware of social problems and may be more inclined to see recreation as a means of alleviating some of these problems. The task before us is to redefine the Federal, State, and private roles in meeting these needs. The Environmental Policy Act of 1969 is one of the first steps toward redefining Federal policy in resource management.

Considerations

In terms of development requirements, the need for high density urban-based Class I recreation experiences comprised 32 percent of the total 1965 Regional needs. Class II development requirements, a large portion of which are urban-based, made up the remaining 68 percent (Figure 4). By 2020, Class I requirements will amount to 41 percent of the Regional recreation needs. The Gila Subregion, the most populous within the Region, accounts for 61 percent of the total development needs with Class I and Class II requirements approximately equal. For the Region as a whole, 70 percent of the total recreation development needs were considered to be urban-oriented. The recreation needs are summarized in Figure 4 for the entire Region and are provided in detail in the Addendum for each Subregion.

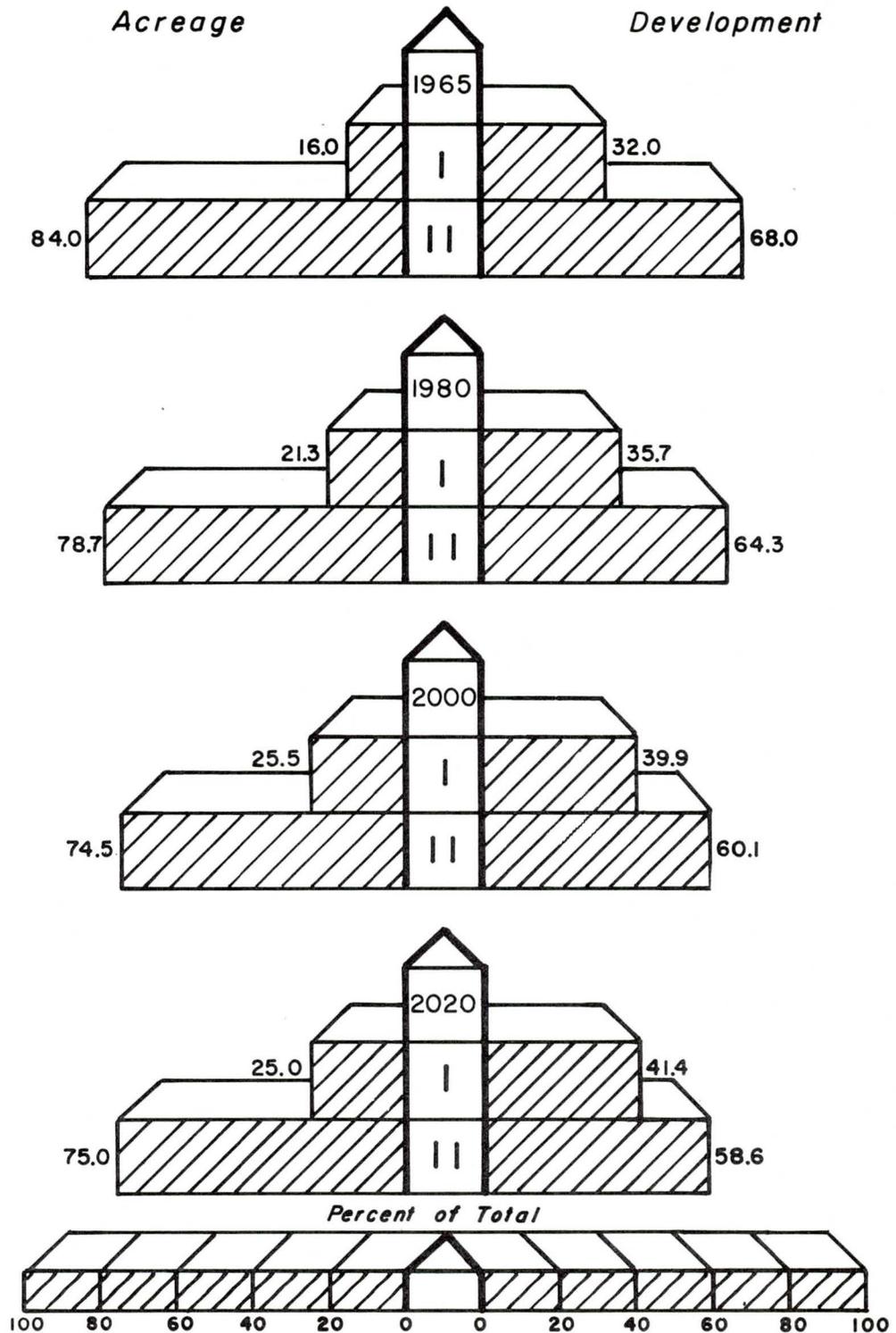
The resource-oriented Classes III, IV and V recreation lands are largely undeveloped and will remain as such. Fully 91 percent of the lands available and suitable for recreation are in the Class III category (Table 1). These lands, however, are actually multiple purpose lands, which besides recreation, are used for fish and wildlife purposes, timber production, grazing and agriculture. Although they are much less intensively used than land Classes I or II, Class III areas comprise an invaluable open space resource affording the only opportunities for such extensive use activities as hunting and fishing. In the Lower Colorado Region, there is an abundance of these areas.

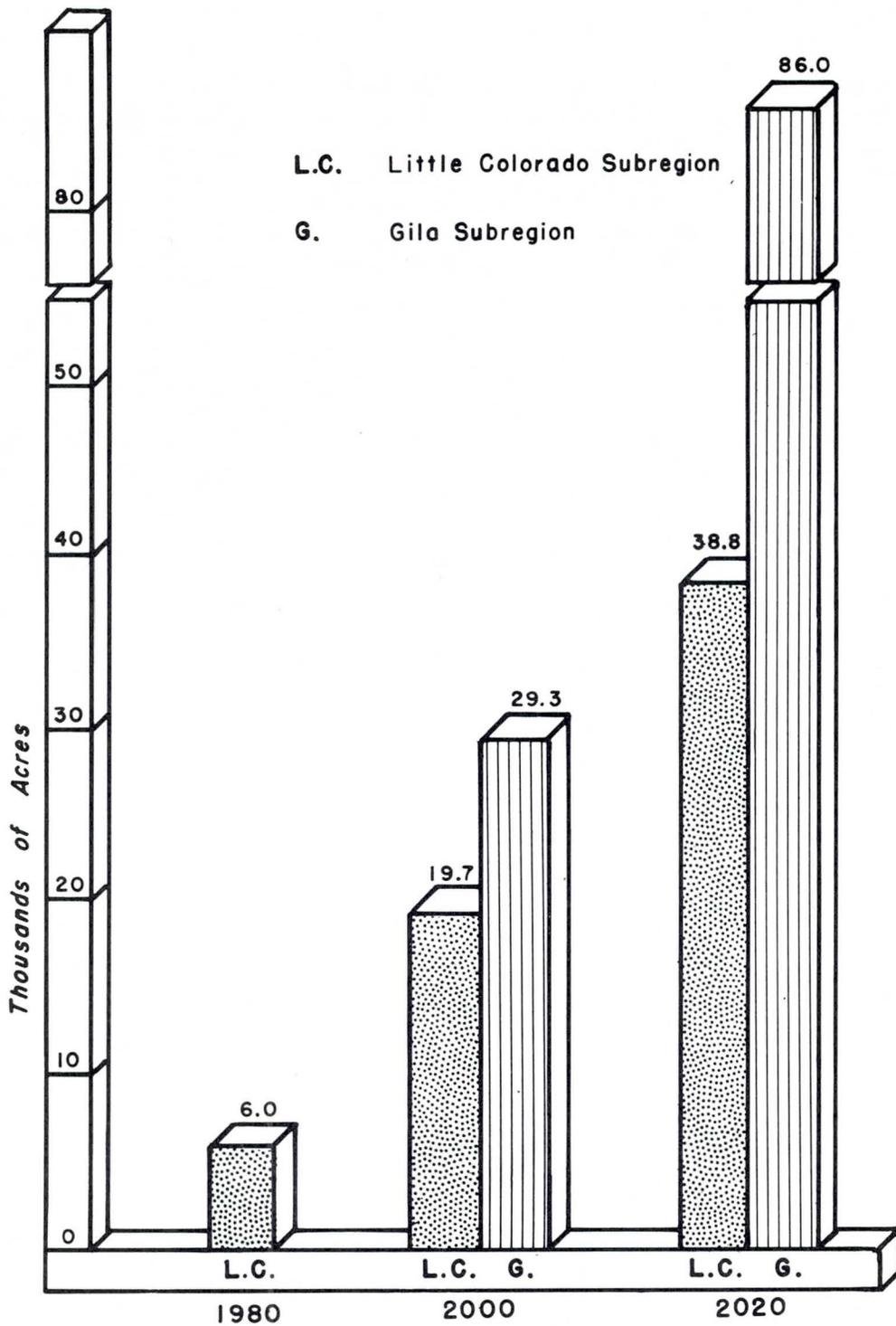
Because Class IV and Class V areas are rather fixed in supply and limited to special geographic areas of the Region, any unmet demands for recreation experiences on these exclusive lands will have to be satisfied by the surplus Class III areas.

Regional water-based recreation needs in recreation days of development and acres of land required to support this development are shown in Table A-5 on page XII-A-40 in the Addendum. Only those activities actually requiring water for participation--sailing, canoeing, other boating, water-skiing and swimming--were used in calculating these needs, which will total 193,077,000 recreation days and 92,600 acres of land by the final target year 2020. At that time, water-based recreation needs will amount to approximately 30 percent of the total Region recreation needs. The costs of satisfying these water-based needs are also found in the Addendum (Table A-6, page XII-A-41) and by 2020 will amount to \$661,151,000 and \$102,033,000 for development and land acquisition, respectively. Fishing needs are treated at length in the Fish and Wildlife Appendix.

To determine the amount of water required to satisfy these needs it was necessary to express the water-based recreation needs in acres of water. It should be pointed out that boating was the key activity used in estimating future water area needs. This activity by far

Figure 4
LOWER COLORADO REGION
TOTAL REGIONAL NEEDS FOR CLASS I &
CLASS II LANDS (PERCENTAGE)
 (Modified OBE - ERS)





LOWER COLORADO REGION
WATER ACREAGE NEEDS

FIGURE 5

requires the most space and can really only be undertaken on relatively large bodies of water. Alternatives such as swimming pools, on the other hand, can satisfy the needs for swimming. As Figure 5 shows, the Little Colorado Subregion will have a shortage of surface water acreage by 1980, and by 2000 the Gila Subregion will also have a shortage. In total, the amount of acreage required to meet future needs will be nearly 125,000 acres by 2020.

PLAN FORMULATION

CHAPTER D - PLAN FORMULATION

PLANNING OBJECTIVES

The planning objective for the Recreation Appendix is the same as that for the study as a whole--namely, to provide the best use, or combination of uses, of water and related land resources to meet all foreseeable short and long -term needs. Improving the quality of life and the environment are prime goals in plan formulation. Judging by the magnitude of future needs and problems, however, it becomes increasingly apparent that the job may really be one of maintaining the present quality of our human and environmental condition. Our main planning objective has been to develop a program reasonably designed to meet as many of the recreation needs as possible and to recommend the preservation or enhancement of exceptional natural areas.

Recreation is basically a social phenomenon which, because it requires space, has considerable impact on the landscape. Competing economic and resource requirements for land and water often collide with recreation needs and values. Where appropriate, interrelationships between recreation and other land and water uses have been recognized, particularly where conflicts are significant. Resolution of these conflicts is beyond the scope of this Appendix, although various means are suggested for dealing with such problems. The recreation plan, therefore, is basically single-purpose. Problems relating to conflicts are noted when necessary as requiring more intensive study.

ALTERNATIVE POPULATION PROJECTIONS

For planning purposes, the Lower Colorado Framework Study considered two alternative levels of population growth and distribution--the OBE-ERS plan and a plan based on a modification of OBE-ERS projections (Table 6). The OBE-ERS figures were developed for the Nation as a whole by the Office of Business Economics in the Department of Commerce and the Economic Research Service in the Department of Agriculture. The national figures were then disaggregated and allocated to the various regions in the country according to their respective share of the projected national growth. Modified OBE-ERS figures were developed by the staff of the Lower Colorado Region Framework Study. These two sets of population projections differ by only 342,800 people in 2020. Each of the projections results in somewhat different patterns of recreation demand and needs. The modified OBE-ERS population is the basis for the recreation plans set forth in this report. Different development, land acquisition and water needs based on the OBE-ERS projections are shown in the Addendum.

TABLE 5
POPULATION PROJECTIONS
LOWER COLORADO REGION

MODIFIED OBE-ERS

	1965	1980	2000	2020
Lower Main Stem	312,780	762,300	1,429,300	1,874,700
Little Colorado	151,300	223,900	293,100	389,400
Gila	1,383,200	1,880,600	3,000,000	4,612,700
Total	<u>1,847,280</u>	<u>2,866,800</u>	<u>4,722,400</u>	<u>6,876,800</u>

OBE-ERS

	1965	1980	2000	2020
Lower Main Stem	312,780	504,800	935,000	1,612,800
Little Colorado	151,300	218,200	267,500	320,000
Gila	1,383,200	1,879,100	2,993,200	4,601,200
Total	<u>1,847,280</u>	<u>2,602,100</u>	<u>4,195,700</u>	<u>6,534,000</u>

ALTERNATIVE MEANS TO SATISFY NEEDS

Two alternative plans for meeting recreation needs have been developed in this Appendix. The first alternative plan rests largely on a projection of present trends constrained within existing physical, legal, institutional and financial frameworks. Each Federal agency with the responsibility for providing recreation opportunities submitted projections of their future programs based on the optimum possibilities for developing their resources. Non-Federal plans, including State, local and private interests, were similarly projected based primarily on historical performance. Alternative I then, is the response of the framework plan to meeting the recreation needs in the absence of any change in existing constraints.

It is not surprising that the response of the framework plan is disappointing (Table 6). Although the plan should provide an increased resource capacity of 285 million recreation days costing some \$1,052 million, there would still be an unmet need of 386 million recreation days in 2020. This deficiency is nearly 58 percent of the identified needs in the Lower Colorado Region. Based on traditional allocations for supplying recreation opportunities, the deficit falls into the non-Federal sector. This deficit is illustrated in Tables 7 and 8. Estimated non-Federal planned response installation expenditures by 2020 amount to \$410 million versus a cost of \$1,903 million which would be required to satisfy all recreation needs.

The second alternative was developed by examining the potential for meeting all recreation needs. The resources required, in terms of land and water are physically available. The basic question in formulating this alternative centered on which policies and constraints can be adjusted to allow for an effective program. As many choices as possible were identified, however the number of choices depends largely on the flexibility of existing constraints. In some cases there is enough latitude for several options, while in others the choices are quite limited. Some of these constraints are briefly outlined below and the options for meeting all recreation needs are discussed in the next section under the heading "A Program for Meeting Recreation Needs".

Social Constraints

Basic to the planning process was the decision to use two different projections of population distribution--the OBE-ERS plan and the modified OBE-ERS projections. These projections build largely on an expansion of existing urban centers and generally follow the current of historical population growth patterns. It should be noted, however, that there is a growing interest in programs to guide future population growth and distribution. Some of these problems are now under investigation by the Federal Commission on Population Growth and the American Future.

Beyond the planning restrictions imposed by population size and distribution are those related to the character of the population. The age, sex and ethnic composition of populations all influence the type and location of recreation facilities and areas. The recreation needs of retirement communities like Sun City, for instance, are quite different from those of south Phoenix. Even something as difficult to grasp or analyze as the different ways in which people perceive their environment influences the possibilities for meeting future recreation needs. Beautification programs, for instance, are not universally popular. To low income groups such programs may seem ironic and actually become symbolic of their neglect. To others, it may be news and go somewhat against the grain, to learn that a junkyard is distasteful and should be hidden by shrubs. We know very little of the

TABLE 6
 LOWER COLORADO REGION
 EFFECTS OF PLANNED RESPONSE
 TO SATISFYING RECREATION NEEDS (ALTERNATIVE I)
 (Cumulative)
 MODIFIED OBE-ERS

FUNCTION BY TIME FRAME	UNITS	NEEDS	PLANNED RESPONSE (Alternative I)	UNMET NEEDS
<u>Development</u> ^{1/}				
	Million Rec. Days			
1980		144	51	93
2000		364	170	194
2020		671	285	386
<u>Water</u> ^{2/}				
	Acres			
1980		6,000	0	6,000
2000		49,000	30,510	18,490
2020		125,000	40,345	84,655
<u>Land</u> ^{3/}				
	Acres			
1980		1,381,000	1,327,327	53,673
2000		1,785,000	1,662,443	122,557
2020		2,170,000	1,933,548	236,452

1/ Development needs are expressed in terms of recreation days accommodated through the provision of such recreation facilities as boat launching ramps, picnic tables, marinas, etc.

2/ Water surface area needs reflect the resource required to satisfy those activities using water, such as swimming, boating, water-skiing, sailing and canoeing.

3/ Land requirements include land acquisition needs and acres of already publicly-owned lands that will be required for single-purpose recreation use. On the whole, these figures represent developed recreation land requirements and do not reflect needs for undeveloped lands.

TABLE 7
 LOWER COLORADO REGION
 ESTIMATED COSTS OF PLANNED RESPONSE
 TO SATISFYING RECREATION NEEDS (ALTERNATIVE I)
 (Cumulated in millions of
 dollars added to 1965 base)
 MODIFIED OBE-ERS

Time Frame	Installation			Operation & Maintenance ^{1/}		
	Federal	Non- Federal	Total	Federal	Non- Federal	Total
1980	103.0	91.0	194.0	9.5	8.8	18.3
2000	426.0	213.0	639.0	39.5	20.9	60.4
2020	642.0	410.0	1,052.0	63.0	41.0	104.0

^{1/} Includes annual operation, maintenance and replacement costs for the target year levels of development.

TABLE 8
 LOWER COLORADO REGION
 ESTIMATED COSTS OF SATISFYING TOTAL RECREATION
 NEEDS (ALTERNATIVE II)
 (Cumulated in millions of
 dollars added to 1965 base)
 MODIFIED OBE-ERS

Time Frame	Installation			Operation & Maintenance ^{1/}		
	Federal	Non- Federal	Total	Federal	Non- Federal	Total
1980	103.0	455.6	558.6	9.5	43.8	53.3
2000	426.0	959.4	1,385.4	39.5	98.8	138.3
2020	642.0	1,903.6	2,545.6	63.0	193.8	256.8

^{1/} Includes annual operation, maintenance and replacement costs for the target year levels of development.

different images Americans have of their environment. But evidence is mounting that it is not one view shared in common. There is a need, therefore, for providing a range or variety of recreation environments.

Physical Constraints

For certain kinds of recreation experiences, physical features such as climate and vegetation limit the possibilities for meeting needs. This is particularly so in the Lower Colorado Region, where the physical character of one area is so different from that of another. However great the demand for skiing in the Lower Main Stem Subregion, for example, there simply is not enough appropriate terrain or snow available to meet the needs. Fishing in southern Arizona is similarly limited by lack of suitable streams and bodies of water. Hunting, as another example, is limited to areas of suitable wildlife habitat.

To some extent, however, limitations imposed by physical conditions can be changed. Artificial snow for skiing has been used effectively in cold climates receiving little or no natural snowfall. Reservoirs, constructed for flood control and water supply purposes, can provide water-based recreation opportunities in areas deficient in lakes or other bodies of water. Landscaping provides natural cover for picnicking, hiking and camping. In the future, these man-made alternatives to the constraints imposed by the physical environment will be much more important.

Air and water pollution also pose a potential threat for limiting recreation opportunities in the Lower Colorado Region. Conditions certainly do not begin to match Los Angeles' smog or Lake Erie's pollution; however when viewed within the context of time and the fragile desert environment there is a definite cause for concern. Isolated pockets of environmental damage can be seen in the Las Vegas Wash and the beginning of air pollution in Phoenix. Pollution is really a physical manifestation of social problems and can be corrected if there is a dedicated program to do the job.

Institutional, Financial and Political Constraints

By far the most flexible constraints limiting alternative means to satisfying needs are institutional, financial and political. These controls are very sensitive to the changing patterns of social needs. In the past, there has been a continuous reassessment of our institutional and financial arrangements. New directions and priorities were required to do the job then and no doubt demands and needs will result in different goals and methods in the future. For the most part the recreation plan presented in the section--"A Program for Meeting Recreation Needs"--is based on existing institutional arrangements, but where these are inadequate, the plan includes a number of institutional and financial proposals, which if implemented would greatly help in meeting future needs.

In many cases, there is an overlap of constraints limiting alternatives to meeting needs. Social, financial and legal constraints underlie state limitations on bonded indebtedness, which has prevented the financing of many recreation programs through general obligation bonds.

Public access is often prohibited on private lands. In many instances, no trespassing signs are the result of vandalism, littering, maintenance and liability difficulties. Similar problems are encountered where public lands are inaccessible because they are surrounded on all sides by private land with no access roads.

Lack of effective land use regulations and failure to provide land for open space development have resulted in the loss of many valuable recreation opportunities. Indiscriminate development in hazardous flood plain areas for residential, industrial and commercial uses has precluded recreational type developments and has required the installation of flood control facilities to protect life and property. Federal programs, such as Flood Plain Management Services and National Flood Insurance, have been enacted to encourage better use of the Nation's flood plains. Although the Flood Plain Management Services Program is still relatively new, the flood plain information reports provide local institutions a basis for study and planning for optimum use and development of flood plain areas through zoning and subdivision regulations, construction of flood control projects or a combination of these and other approaches to reduce flood hazards and damages. The National Flood Insurance Act has not been in existence long enough to evaluate its effectiveness in preventing development in flood plains. However, many local institutions have already made application for participation in the program and have indicated their willingness to comply with the restrictions on development imposed under the National Flood Insurance Act of 1968.

Probably the greatest constraint acting to prevent the satisfaction of recreation needs where required is government itself. Each level of government--Federal, State and local--has defined its functions and responsibilities in a fairly exclusive way. Only infrequently do the Federal and State levels become involved in meeting local needs. But coping with these needs now exceeds the financial capability of cities, districts and counties. The emphasis on resource-based recreation areas common to State and Federal programs might be redirected in part to the local level to assist in providing user-based recreation areas.

Alternatives to the distribution of needs are very limited since recreation is a function of population and available time. If these constraints were adjusted to allow for both a different population distribution and time budget, the potential for satisfying needs would greatly increase. Innovations such as staggered school and work

vacation schedules through the year would more evenly distribute recreation demand. It is doubtful if this would have much impact on the location of needs, however, since the distribution of population is really the key factor, but it would certainly relieve overuse at peak periods. In as equable a climate as the Lower Colorado Region's, this is a very reasonable alternative.

Other constraints on the location of facilities include income and access, which act as considerable barriers for deprived neighborhoods in the urban core. If deficiencies for these people are to be satisfied, recreation areas and facilities should be located nearby. Alternatively, free or subsidized transportation to areas otherwise inaccessible to these people should be provided.

This brief review hardly exhausts the list of constraints limiting possible alternatives. The recreation plan presented in the following sections capitalizes on some of these alternatives. The plan is not a final or inflexible solution to the Region's recreation problems. It is simply considered the most desirable and reasonable of alternative actions. If the recommended changes in policy and legal and institutional arrangements are implemented, then most of the Region's future recreation problems should be greatly alleviated.

It must be recognized that there are few alternatives to a quality recreation environment. We are, after all, striving to enhance the quality of life and the quality of the environment. This entails an optimum pattern of land use and population distribution. Since this is unlikely, the job is really one of compromising quality in favor of reality. Certain compromises might result in irreversible losses to the recreation environment. There are no alternatives to wilderness areas, wild and scenic rivers, archeologic, historic or natural areas. Wherever possible, we must take special care to avoid actions with adverse impacts on the environment. In fact, in order to protect the fragile quality of such unique and limited resources, it may even be necessary to limit their recreation use.

THE JOB AHEAD

CHAPTER E - THE JOB AHEAD

CHANGING CONCEPTS OF RESOURCE USE

A confusing mix of values, attitudes and directions characterized the Region's growth and settlement in the past. The resulting loss, both to the land and to the people, has commanded recent attention. In retrospect, it may seem difficult to understand why some mistakes were made, particularly where poor judgment was obviously involved. But many decisions were made when circumstances were considerably different and when the effects of certain policies on the environment were less understood. Criticism of the past and the present must be tempered by acknowledging the enormous economic and social gains to the Region. The question now, however, is whether we can continue to allow such uncoordinated growth and development.

American attitudes have been strongly flavored by our frontier heritage. Nostalgia for frontier freedoms, however, is inadequate as a motif for space age decisions. In any case, that heritage in part includes the fact that Americans had no tradition of city planning or land use control. They were further burdened with an antipathy toward cities and urban life. The design of our cities and our countryside reflects this lack of sensitivity.

Among the most profound facts characterizing the Region is the ascendancy of cities as the primary force in shaping the institutions and policies of the future. Even in this Region, with its wealth of "wide open spaces", 87 percent of the 2020 population will live in the Las Vegas, Phoenix and Tucson metropolitan areas. Increasing population and urbanization have created unique demands on resources, one of which--recreation--is having considerable impact on management decisions. Natural resources and land use patterns are intimately tied to the urban milieu and their values have assumed a cultural and social significance uncommon in the past. Westerners are beginning to see the countryside as a place to play and rest, away from the fast pace of urban life. They see it less and less as a hostile foe to be conquered. The frontier philosophy that ownership gives unlimited authority to use and abuse with laissez faire discretion is no longer tenable. Instead, we should seek to substitute the concept of trusteeship for exploitation.

THE CASE FOR OPEN SPACE

Ideally, the future should bring a more rational resolution of land use conflicts. The patterns of growth and development which have characterized the Region's metropolitan areas in the past may not be suitable as the Region's population swells to 6.9 million residents by 2020. Careful planning will be required if the future generations are to have pleasant surroundings and a close personal identity to the "wide open spaces". The provision of open space within urban areas is thus a desirable goal which challenges us to alter past policies of continuous and unbroken suburbs. Resolution of conflicts between development and open space in favor of the latter may not always seem economically justified; however, if open space is not provided as the city's edge moves further and further out, the future generations will have only a longing for that which might have been.

Unlike other resource uses, such as mining, grazing and timber production, open space is a functional concept, which when properly employed promises the efficient and economic use of land. By preserving open space, the continued use of land for agriculture, timber, mining, watershed, wildlife, recreation and other purposes can be assured. And by preserving open space, future urban settlement patterns can be formed and guided in physically and socially desirable ways. In effect, an open space program is a tool for resolving future land use conflicts and reducing competition for space.

In general, open space may be broadly classed as including land needed for any of the following purposes:

1. resource production
2. health and well-being
3. preservation of natural and cultural values
4. public safety (such as hazardous flood plains)
5. rights-of-way
6. future development

For the most part, advocates of preserving open space have emphasized the need in metropolitan areas. So limited a focus, however, fails to recognize the nature of urban life or the function of open space. Certainly, open space is most needed in built up areas where it can serve to prevent urban sprawl and protect land needed for other purposes. The urban hinterland, however, extends from metropolitan areas to the corners of the Region and beyond. The Mogollon Rim, for example, is an amenity of urban life in that it is part of the recreation environment needed and used by people living in cities. A comprehensive open space program entails controls in both the countryside and urban areas.

Use of the Flood Plain - Greenbelts

In the process of controlling flood hazards, the natural character of streams is usually lost. The loss to recreation activities and environmental quality often can be irreversible. In parts of the Lower Colorado Region there are still opportunities for preserving waterways as open space and recreation areas. These greenbelts are particularly useful in cities where the streams serve to integrate open space with settlement patterns. An outstanding greenbelt has been proposed along 38 miles of the Salt River through Phoenix.

Starting in 1966, a group of students at the Arizona State University, College of Architecture, conducted a class project on the feasibility of reestablishing water areas in the Salt River. Today the only water in the Salt is floodwater which often overflows the normal channel and damages adjoining property. The students called their plan the Rio Salado Project, resurrecting the Spanish name for Salt River. Initial plans called for man-made lakes in the heart of Phoenix formed by low-level dams across the river. As the concept evolved, an innovative scheme to restore life to the river through waste water reclamation took form. Soon the proposal involved twin lakes, four miles long, and a 2,260 acre recreation area between Tempe and Scottsdale. The recreation area would contain parks, playing fields, picnic areas, a golf course and the future site of the Arizona State Fairground.

There are a number of obstacles to returning water to the Salt River. First, the water must be secured. There are possibilities for an appropriation from the Central Arizona Project, when it is finally built, or a re-routing of the Salt River Project delivery system, so that the water would remain in the river as it passes through the area to be taken out later. Evaporation and seepage are admitted drawbacks to this plan. A great new source of water that might be tapped is the reuse of the effluent from the sewage treatment plant southwest of Phoenix. It has been demonstrated elsewhere that the water could be purified and delivered to the upstream lakes.

Another major problem facing the proposal stems from the fact that at least half of the river bottom land is privately owned. This land provides central Arizona with much of its sand and gravel requirements. To return these lands to public ownership and still continue to provide for the continued mining of the gravel pits would not be easy.

Valley Forward, a civic organization, has been coordinating efforts between the Corps of Engineers, the State of Arizona, the Department of Housing and Urban Development, the Environmental Protection Agency and the city to get the project underway. The Corps has expressed its desire to participate to the fullest extent possible

in integrating the environmental values embodied in the Rio Salado Project with its flood control program. The city and State are in the process of applying for a grant from Housing and Urban Development to help finance the project, and the city is attempting to obtain a demonstration grant from the Environmental Protection Agency to reclaim sewage effluent for recreation use in the project.

Flood Plain Management

As defined in the Flood Control Appendix, flood plain management techniques include both structural features (reservoirs, levees and channels) and non-structural measures. The non-structural measures include flood fighting, floodway regulation, flood plain zoning, flood proofing and flood forecasting. Floodway regulation is aimed at preventing development, whether subject to damage or not, that would adversely affect the passage of flood flows. Flood plain zoning, a local responsibility, contemplates restrictions in the use of areas subject to flooding appropriate with the hazards of such use. Flood proofing involves modification of buildings and structures and their contents.

With the passage of the National Flood Insurance Act of 1968, communities must institute certain flood plain management techniques if they are to receive flood insurance. These include:

1. Restricting development of land subject to flood damage.
2. Guiding development of proposed construction away from flood prone areas.
3. Assisting in reducing damage caused by floods.
4. Improving the long-range land management and use of flood prone areas.

The Federal government is presently limited in its Flood Plain Management Services Program to studies of hazardous areas and advice to the affected communities. The local agencies then decide upon the measures that best meet their needs. The burden of implementing non-structural measures falls entirely on local government or private individuals. Denial of flood insurance can be a major deterrent to settlement or development, but even this is sometimes ignored.

Effective enforcement of a permanent open space plan in concert with acquisition of land and development rights in the flood plain are probably the key elements in preserving environmental values. If a plan shows that it would be more scenic or less expensive to control floods by purchasing land than by structural measures, then it seems reasonable that this be done. Local government, however, must weigh

their relative costs of providing all the money for land acquisition versus applying for Federal assistance for structural measures. With the Federal Government sharing the cost, the expenditure of local government may be far less than using non-structural measures. This fact, combined with the prospect of land being removed from the local tax roles, is usually enough to tip the balance in favor of dams, channels or other structural features. The paradox here is that generally the least expensive measure for the local government is the most expensive measure to the general public. To prevent the possibility of this occurring, the Federal Government should be authorized to protect flood plains by acquisition in lieu of structural measures whenever land acquisition cost would be lower or where natural values to be protected warrant the extra expenditure.

In an inventory of urban areas subject to flood damage within upstream areas of the Region, the Land Resources and Use Appendix found that more than 60,000 acres could be reserved through flood plain zoning. Of this total, more than 36,000 acres are located in the Lower Main Stem, 6,000 acres in the Little Colorado and 17,500 acres in the Gila. Setting these areas aside now for recreation or greenbelt purposes could greatly help in meeting urban recreation needs.

The Bureau of Land Management recently set aside public lands along the Gila River from the Texas Hill area to the vicinity of Phoenix, Arizona, as a multiple use management area with emphasis on protection of white wing dove nesting habitat. This area is generally known as the "Greenbelt". Threats to the natural character of the Gila remain a problem. The Advisory Commission on Arizona Environment, for instance, has been actively trying to prevent phreatophyte eradication and other vegetative clearing which has been proposed along the river, particularly downstream from Painted Rock and Camelsback Dam sites.



Protecting Open Space Values Along Flood Plains

Current legislation authorizes consideration of recreation and environmental factors in the planning, design and construction of local flood control projects.^{1/} The actual consideration of these values, however, poses many difficult problems. Not the least of these is the intangible nature of many environmental values. Benefit-cost analyses depend on certain economic and quantitative measurements. The techniques used in making such studies only rarely succeed in adequately measuring intangible aspects. If alternative solutions to flood control problems are to be fairly presented and compared, some system of measuring the environmental benefits involved must be found.

Apart from our present inability to satisfactorily measure environmental values, there are problems involved with flood control alternatives that reach beyond the scope of existing institutional and social arrangements. The basic question of whether a particular stream valley is more valuable for open space purposes than for intensive settlement depends on the value society attaches to open space. There may be an economic case for open space that could be reflected in a benefit-cost analysis; there could just as easily not be, even if open space were the most desirable alternative.

Decisions in favor of open space entail a policy of settlement, development and growth that is refined enough to provide guidelines for future development. There is neither policy nor any public agency equipped or in a position to make such judgments at this time. If we are going to effectively cope with these problems, the decision makers and planners must invent the necessary political, economic and legal remedies that will give society and its individuals more real choices concerning flood plain development. Those choices should be framed within a system of multiple goals including an effective appraisal in quantitative or comparable terms of the following questions:

^{1/} Current policy authorizes recreational developments at non-reservoir flood control projects at Federal cost if a non-Federal entity provides all additional lands, or rights in land, required to insure public control of the development, plus additional contributions sufficient to bring the non-Federal share to at least 50 percent of the total first cost of the recreational development. The local entity is required to operate and maintain such facilities for the life of the Federal project. Beautification is provided as a regular project cost with an upward limit of 3 percent of the total project cost. Local participation includes maintenance for the life of the Federal project.

- a. To what extent and for what purposes should the Federal government purchase land and/or development rights, especially along flood plains for the purpose of preserving open space?
- b. To what extent should enhancement of environmental values be included as a project purpose?
- c. To what extent should the costs involved with such environmental measures be shared between Federal and non-Federal interests?
- d. Should mitigation of damages to recreation and environmental values be considered as a project cost, as is now the case for fish and wildlife resources?

A State Program

In the final analysis, the power of land use control is the only effective technique for preventing urban sprawl and preserving open space. In view of the Region's past and future growth, they represent essential steps along the road toward environmental quality. A state-wide land use policy should be formulated under the various State's laws, which considers, among other matters, the following:

- a. Establishment of single agencies within the States having zoning authority and the responsibility for preparing official statewide land use plans. Local zoning and general plans should be in conformance with these plans.
- b. Designation and protection by law of permanent open space zones.
- c. Establishment of State open space funds for the acquisition of required open space identified in the plans.
- d. Authority for the States to underwrite liability and comprehensive insurance for those private landowners making their lands available for public recreation use.
- e. Management of State lands under multiple use policies which recognize recreation and fish and wildlife as desirable entities.

A PROGRAM FOR MEETING RECREATION NEEDS

In previous sections, the changing concepts of land use and resource utilization were discussed along with the need for a new landownership concept, stressing trusteeship rather than exploitation. A case was made for preserving open space in order to enhance environmental quality, resolve land use conflicts and guide development that will continue at an accelerated pace due to increasing population and urbanization pressures. These pressures on a limited resource base have resulted in a less than satisfactory recreation environment. Recreation needs and desires have been increasing and changing faster than present levels of development and management techniques can accommodate. A new direction is needed in order to provide a recreation environment that more effectively utilizes our resources, both physical and human, in meeting the environmental and social needs of the Region and Nation.

Each of the states in the Region have developed State Comprehensive Outdoor Recreation Plans (SCORP's) in which State goals and objectives are delineated. These State plans were taken into consideration in the preparation of this program for meeting recreation needs. Because of the volume of information contained in each SCORP, each goal and objective is not reiterated here. It is essential that those who use this study recognize that in taking a Regional approach to meeting recreation needs, there may be some variance from the goals and objectives of the different State plans.

This section proposes a program that, after considering all logical alternatives along with certain built-in constraints, most adequately provides for the future recreation needs of the Lower Colorado Region. This recreation program is not thought of as the "ultimate" plan for the Region nor an inflexible development tool. However, given certain fundamental constraints, acknowledged data deficiencies and present limitations in the state of the art, it is considered to be the most desirable among the various alternatives available. The general recreation program outlines an action program for meeting outdoor recreation needs, indicates problems which may be encountered in planning or development, and delineates responsibilities for implementing such a program.

Meeting Urban Needs

It is significant that over 70 percent of the Region's 1965 population was concentrated in the Phoenix, Tucson and Las Vegas metropolitan areas. This will increase to over 85 percent by 2020. Such a population distribution results in 70 percent of the total Regional recreation needs (including tourists) being classified as urban-oriented.

The burden of satisfying the urban recreation development needs for the target year 2020 (470 million recreation days) as well as the acreage acquisition needs (185,200 acres) will fall heavily on the local governmental agencies. However, because of the myriad problems confronting cities and urban counties, these local agencies are least able financially and technically to meet this challenge. It is estimated that the total cost for urban recreation development and land acquisition by 2020 will amount to \$1.33 billion and \$357 million respectively. Obviously, if local governments are to attain the desired level of recreation programming indicated by these figures, they are going to need more than just token assistance from the Federal and State governments.

The Federal Role in Meeting Urban Needs

Land Management and Surplus Property

In 1951, the Federal Interagency Committee on Recreation adopted "A Recommended General Policy of the Federal Government Relative to Public Recreation". It states that:

"It is the responsibility of the Federal government to develop, and to arrange for others to develop, the recreation resources on the Federally-owned lands, and to complement State and local programs in full cooperation with the States and their political subdivisions, without assuming responsibilities that properly rest with the States and their political subdivisions."

Most of the urban recreation areas are now managed by non-Federal agencies. This policy should continue; however, there are large areas of Federal lands within close proximity to the urban centers. Many of these areas have important open space and recreation potential but, because of their size and/or unique problems, are beyond the local agencies capability to manage. In these cases the Federal government can play an important role in providing recreation opportunity.

The Federal government has responsibility for the development of the important recreation potential of lands along the Colorado River between Davis Dam and the Mexican border (a 280-mile stretch). As a result, it is in an ideal position to accommodate the anticipated recreation demand resulting from the future urbanization expected to occur along this waterway. The Lower Colorado River Land Use Plan, developed a number of years ago to guide planning, indicates that the creation of new towns or areas of urban concentration, as well as the expansion of existing cities, properly falls within the province of the Federal government and the counties involved. In some cases, the new urban developments involve a combination of Public Domain and private lands. The Federal landownership pattern along the Lower



Scene at the Arizona Snow Bowl on the Coconino National Forest near Flagstaff, Arizona (USDA, Forest Service, Southwestern Region).



The cool waters of Oak Creek, Coconino National Forest, provide recreationists with recreation opportunities (USDA, Forest Service, Southwestern Region).

Colorado provides an ideal opportunity to assist in guiding the future growth and development of many parts of this area, while at the same time helping to provide the required recreation facilities.

The Las Vegas Valley is rimmed on its western edge by the Spring Mountain Range. Because of the size of this complex and the widely scattered nature of the recreational sites, it is almost mandatory that ultimate development of the recreational resource be accomplished within the sphere of influence of a Federal agency. The Red Rock Canyon area, only 15 miles from Las Vegas, administered under a State-Federal joint management agreement, is an area of outstanding esthetic and recreation potential. Due to the rapid urbanization of this area, the preservation and proper administration of the geological, archeological and special desert-type ecological niches of this site for study and non-destructive recreation enjoyment is of critical importance for both resident and non-resident alike. This recreation complex should prove to be an excellent complement to the facilities at the nearby Charleston Peak recreation area (Toiyabe National Forest).

Generally speaking, there are national forest lands and facilities located close to the Region's population centers. Tonto National Forest, Coronado National Forest and Toiyabe National Forest are less than an hour's drive from Phoenix, Tucson and Las Vegas respectively, while Flagstaff is surrounded by Coconino National Forest. Because of this close proximity to population concentrations, and the consequent overuse of many existing facilities, long-range recreation development plans through the year 2000 have been prepared to provide the expanded picnicking, camping, marina facilities and parking needed to keep pace with the rising demands of these urban areas.

Lake Mead National Recreation Area lies within a 30-mile drive of Las Vegas and is a prime recreation area for water-based and water-enhanced activities. The rapid growth of the Las Vegas metropolitan area, the attractiveness of Lake Mead to both resident and non-resident alike and the spiralling popularity of boating may lead to serious overuse unless development of access and facilities keeps pace with use. Development plans will be necessary to properly plan for and guide the anticipated use.

Each Federal agency is charged with the responsibility of reviewing its land and other property needs in relation to its holdings. Considerable amounts of Federally-administered land in and adjacent to metropolitan areas may prove to be either surplus to present agency needs or possibly of greater value as recreation lands. A property review board has been set up by Presidential Executive Order to review all Federally-administered real estate in order to identify properties that can be converted to public recreation use or sold, with proceeds used to acquire additional recreation areas. This program should be vigorously implemented with special emphasis on review of lands within or near urban centers.

To encourage Federal agencies to make more efficient utilization of their real property, the budgetary penalty now imposed on agencies relinquishing one site and moving to another should be removed. The costs of relocating these installations and converting the land for recreation use could be financed through the sale of surplus property. This would help foster relocation of Federal installations presently occupying prime recreation sites.

Federal Financial Assistance

The Federal government has over 50 grant programs available to State and local agencies for park and recreation purposes. Table 9 ^{1/} gives a brief description of the major programs available to State and local government, their authorizing legislation and administering agencies. A complete review of all such programs is presented in Federal Outdoor Recreation Programs published by the Bureau of Outdoor Recreation and in Federal Aids to Local Governments published by the National League of Cities.

Many agencies administer grants-in-aid, resulting in overlap, conflict, confusion and overly burdensome red tape. A thorough study should be made of all major Federal grant programs dealing with recreation, beautification and open space to determine the feasibility of consolidating all such programs under one administering authority. Such consolidation would seem necessary to provide the proper continuity, coordination and efficiency in administration and distribution. If such consolidation is impractical, a single agency should be authorized to coordinate the granting of all Federal financial assistance to State and local governments for recreation purposes.

The agency would set funding priorities according to the following schedule:

1. Urban needs, especially those of the inner-city ghetto areas.
2. Regional needs, particularly those of the mobile suburban population in lands surrounding urban areas.
3. The needs of the rural and mountain counties where the growing impact of seasonal tourists and recreationists from urban areas is being felt.

^{1/} Extracted from Recreation in the Nation's Cities - Problems and Approaches, a report prepared for the Bureau of Outdoor Recreation by the National League of Cities.

TABLE 9
MAJOR FEDERAL AID PROGRAMS UTILIZED FOR
PARKS AND RECREATION PURPOSES

<u>Program Title and Authorizing Legislation</u>	<u>Administering Agency</u>	<u>Program Description</u>
Land and Water Conserva- tion Fund Land and Water Conserva- tion Fund Act of 1965	Bureau of Outdoor Recreation, Department of the Interior	Grants are made to States, and through them to local governments, for planning, acquisition, and development of public outdoor recreation areas and facilities. Grants are made to finance 50 percent of allowable project costs.
Neighborhood Facilities Housing and Urban Development Act of 1965	Office of Urban Neighborhood Services, Depart- ment of Housing and Urban Development	Grants are made to local governments to help finance neighborhood or community centers providing a variety of social services. Grants may cover up to two-thirds of project costs, or up to three-fourths in redevelopment areas.
Community Action Programs Economic Opportunity Act of 1964	Office of Economic Opportunity	Through the Community Action Programs grants are made for public or private nonprofit antipoverty projects. Outdoor recreation projects are included as eligible programs. Grants cover 50 percent of program costs.
Model Neighborhoods Demonstration Cities and Metropolitan Development Act of 1966	Model Cities Administration, Department of Housing and Urban Development	Grants are made to local governments to plan, develop, and carry out comprehensive programs for rebuilding or restoring slum and blighted areas through coordinated use of all available Federal programs and private and local resources. Grants cover 80 percent of the cost of planning, developing, and administering programs, and up to 80 percent of non-Federal contributions required under Federally-assisted projects.
Open-Space Land Housing Act of 1961	Office of Urban Neighborhood Services, Depart- ment of Housing and Urban Development	Grants are made to State and local govern- ments for the acquisition of land for permanent open-space use. Basic improve- ments on the land also qualify for grants. Matching funds are available for both acquisition and improvements.
Urban Beautifi- cation Housing Act of 1961	Office of Urban Neighborhood Services, Depart- ment of Housing and Urban Development	Grants up to 50 percent are made to State and local governments to help beautify publicly-owned land in accordance with an overall beautification program.
Federal Surplus Real Property Federal Property and Administrative Services Act of 1949 as amended	Property Manage- ment and Disposal Service, General Services Admin- istration	Surplus land, buildings, and other real property no longer required for Federal use may be transferred to State or local governments for park and recreation uses at 100 percent of the fair market value. The Bureau of Outdoor Recreation assists in determining if property is suitable and desirable for public park or recreation area use.

The Land and Water Conservation Fund is the primary source of Federal financial assistance available to State and local governments for recreation programs. In fiscal 1971 an average of \$1.6 million was apportioned from the Fund to each state in the Lower Colorado Region. The Fund does not appear large enough to assist local governments to successfully meet recreation needs. With non-Federal recreation costs approaching \$1.9 billion over the next fifty years the present allotment from the LWCF would need to be greatly expanded to enable local and State governments to meet their recreation commitments.

Research and Technical Assistance

The present plight of the cities in their attempts to meet their rapidly expanding recreation needs is well documented by research and writing. Unfortunately, much of this research is rather disjointed and incomplete. No real attempts have been made to appraise and consolidate that which has been written nor point out critical gaps in our present knowledge of this subject. What is needed is a clearing house for nationwide urban recreation research. In view of this need, an urban recreation division should be established in a non-land managing agency such as the Bureau of Outdoor Recreation to focus on the urban problems. This division would inventory and evaluate all studies concerning urban recreation published to date, determine areas where new or further research is needed, coordinate on-going research programs and provide cities with up-to-date information and technical assistance related to urban recreation problems.

The State Role in Meeting Urban Needs

Land Management

In order to help meet the burgeoning recreation and open space needs of metropolitan area residents, emphasis should be given by the various State parks and recreation departments to the acquisition of recreation and park areas within easy access of large population centers. However, only those areas of statewide significance should be purchased. Responsibility for acquisition of other areas, primarily of local or regional use and interest, should remain with the local jurisdiction involved.

In Arizona, a major shortcoming of the enabling legislation creating the State Parks Board was the 160-acre limitation placed on the size of State recreation sites. Acquisition of sites exceeding 160 acres in area requires special authorization by the Legislature. Normally, the Recreation and Public Purposes Act allows a State to acquire 6,400 acres of Public Domain annually (provided the State legislature designates a single State agency to acquire such lands)

for recreation purposes. The requirement to obtain special authorization from the Legislature for sites in excess of 160 acres unduly restricts the Board in carrying out its responsibilities and should be eliminated.

In Arizona, the Highway Department is another State operating agency which provides recreation facilities. Under the Highway Beautification Act of 1965, Federal funds can be obtained for scenic development and road beautification, including acquisition and development of public rest and recreation areas. In addition, on January 17, 1969, the Bureau of Public Roads issued Instructional Memorandum 34-50, which provides for Federal assistance in the development of multiple use facilities on highway rights-of-way. Portions of rights-of-way not required for operational purposes may be converted to public or private use. The following uses are specifically eligible for Federal fund assistance: mini-parks with minimum facilities (walks, benches, sandboxes); site preparation, including grading and drainage, for such recreational facilities as basketball, handball, tennis, play areas, etc.; increased span length for structures to promote desirable public and/or private uses of land areas beneath, over and adjacent to the highway. Where practical, such recreation facilities should be made available to local governments under long-term leases. The terms of these agreements would require the local agencies involved to adequately operate and maintain such sites. With proper planning and innovative design, such areas can go a long way toward helping urban communities meet their recreation needs.

State Surplus Property

The Arizona State Land Department is encouraged, under existing law, to seek a maximum dollar return on the sale and lease of State lands. Furthermore, the sale of State lands must take place at a public auction in the county where the lands are located. This procedure requires the public to compete with private interests for the use of public lands. Although the U.S. Supreme Court ruled in 1967 that the State Highway Department could acquire State land for highway purposes at its appraised fair market value without the requirement of competitive bidding at a public auction, the legal framework within which the State Land Department presently operates does not generally encourage the transfer of State land to other State agencies or local jurisdictions for recreation purposes.

It is imperative that the Legislature seek a better policy for the transfer of those State-owned lands having special recreation value, particularly where they may serve urban needs, to State agencies and local governments at minimal cost rather than at appraised value for non-public uses or at public auction.

State Financial and Technical Assistance

Because of the high price tag attached to a program for meeting urban recreation needs, the States will be unable to contribute a significant portion of the direct financial assistance required. The States should concentrate instead on providing financial and technical assistance to cities for the establishment of new and continuing recreation programs and related facilities. To insure establishment of these programs, each State, through its appropriate outdoor recreation department, should consider establishing a separate division dealing specifically with the problems of urban recreation. In addition to carrying on the necessary research, this division would supply the expertise and financial assistance to local parks and recreation departments with the aim of establishing active recreation programs (both indoor and outdoor), which are of increasing importance in satisfying the recreation desires of urban dwellers. State grants-in-aid should be made available to local agencies primarily for the construction of facilities necessary for such recreation programs. All financial assistance from the States should be on a matching fund basis. The granting of State matching funds would be contingent upon each local jurisdiction having an approved parks and recreation plan on file with the State. A special tax on sporting goods is a possible source of revenue for these State grants-in-aid.

It is important that major Federal grants-in-aid also be allocated to local governments through the States in accordance with these approved local park and recreation plans as is presently done with the Land and Water Conservation Fund. This approach should provide greater overall coordination of city and county recreation plans and programs resulting in more efficient utilization of funds.

Recreation planners and park administrators do not necessarily know the best facilities and programs to fit the needs of most urban residents. Research must be undertaken immediately to insure proper planning to meet these very real, but different, urban recreation needs. The States, through their proposed urban recreation divisions, should launch crash programs of research and study in cooperation with local governments to determine types of facilities and programs desired by urban recreationists.

The physically and mentally handicapped require specialized programs and facilities. We have come a long way in accepting and caring for the handicapped, especially with respect to treatment, education and rehabilitation, but there is much left that should be done in the field of outdoor recreation. Large numbers of disabled persons are not receiving the benefits of the Region's recreation resources. The severity of their disabilities, architectural barriers, non-acceptance by society and slowness of the recreation profession to adjust programs and facilities to their needs, all

have contributed to a serious lack of opportunity. As with other recreation needs, the most critical deficiencies are in the Region's cities. More people specially trained to work with such handicapped individuals are urgently needed.

To fill this need the States should establish special funds to assist the colleges and universities now offering degrees in the recreation field, to expand and intensify their programs dealing with recreation planning for the handicapped. These schools would then provide the necessary manpower, adequately educated and trained, to understand the special recreation needs of the handicapped, to develop programs for their participation and to design the specialized facilities required. The States, through their recreation departments, would provide the necessary technical and financial assistance to local governments for these programs.

The Local Role in Meeting Urban Needs

Much of the need for recreation by the urban population close to home must be provided by or through local governments. The role of Federal and State agencies, for the most part, should be through these local entities since direct governmental involvement at State and Federal levels is not possible or desirable in most instances. It is important that local governments recognize their responsibility and take serious steps to meet it.

Recreation Programs

Providing space and play facilities is no longer enough (if in fact it ever was), as activity-oriented recreation programs have been taking on greater and greater importance. As the recent study by the National League of Cities, entitled Recreation in the Nation's Cities - Problems and Approaches, points out: "Rather than just providing acreage for football, baseball and basketball and swings and slides, programs meeting cultural, artistic and creative needs must be provided as must facilities for sports that people can participate in all their lives".

In order to provide a truly diversified and enriched recreation program, city and county governments are going to have to reorder some priorities and greatly expand their heretofore relatively meager financial commitments.

There is no question that open space is a desirable environmental enhancement, but its value for many recreation purposes is limited, particularly with respect to inner-city residents. Samuel C. Jackson, a former Assistant Secretary of the Department of Housing and Urban Development at a recent National Recreation and Park Association forum on "Parks and Recreation in the Urban Crisis"

declared that "the country's present park and recreation programs were largely irrelevant to the needs and problems of low income, inner-city residents". Since most conservation and recreation organizations represent the middle income, middle-aged and mobile groups--trailer/camper owners, back packers and well-outfitted sportsmen--their interest and concerns are generally not the same as those of core city residents. Most national and State parks, wilderness and primitive areas, wild and scenic rivers, golf courses, private ski resorts, boat marinas and luxury cabins and lodges are out of reach of many inner-city residents due to their location and cost.

In addition to a shortage of facilities and programs available to them, many city residents have not experienced the opportunity to participate in such activities as golf, hiking, sailing or camping and, therefore, are not likely to take up such sports the moment they are made available.

Such people are further inhibited by lack of transportation, fear of traveling outside their neighborhoods, and, in the case of minority groups, concern over their reception and acceptance at unfamiliar areas.

It was mentioned in the "State Role" that more relevant research is necessary to determine exactly what programs and facilities are most desired by urban residents. However, several important conclusions about city recreation programs can be drawn from recent observations. More neighborhood recreation facilities in inner-city areas and more person-oriented recreation programs with properly trained supervisors working with small groups in meaningful interpersonal relationships are necessary to meet the special needs of the disadvantaged.

The percentage of young people 19 years of age and under is increasing more rapidly than the population as a whole. Existing recreation programs are not meeting the needs of this age group, a cause for critical concern. Basically, programs for this group must provide greater variety, a vital ingredient in young people's lives. The teaching of skills in arts, crafts and the many emerging new sports should be stressed, enabling individuals to develop interests that could be pursued over the course of their lifetime. Socially-oriented activities, such as dancing, are particularly important to teenagers and young adults.

There is another group of citizens at the other end of the spectrum whose interests and desires have, in all too many cases, been completely overlooked. For those elderly persons not able to afford space in costly planned "senior citizen" or retirement communities, there is little opportunity to pursue meaningful recreation interests.



City parks provide a living natural laboratory for children to learn something of animals (Phoenix Parks and Recreation Department).



Time out from other activities for rest or singing is often a welcomed form of outdoor recreation (Phoenix Parks and Recreation Department).

These people are generally more interested in less strenuous forms of recreation than those of the younger set, but have an even greater need for socially-oriented activities to give more meaning to their retirement years.

One very important fact, related to the planning of new recreation programs, has become quite evident in recent years. It is futile to plan for people without involving the people being planned for. One reason for the under use of many urban parks, playgrounds, plazas, tot lots and community recreation centers is the lack of communication between park administrators and park users. The previously mentioned report by the National League of Cities points out that in order to be successful, recreation programs must be what the people want, not what the recreation department believes to be best for the people. Increased emphasis on citizen participation should be the essential component for the development of meaningful programs since the total metropolitan area is made up of pockets of different neighborhoods, towns and counties, each with a variety of different needs. A balanced system with central policy determination by the city recreation officials, but with substantial authority vested in residents and neighborhood groups, appears to be the best approach.

The best thought-out and most lavishly funded programs will receive little more than token participation unless they are promoted properly. It is vitally important that city and county recreation officials realize that they must do more than just provide recreation opportunities. To insure full utilization of facilities and programs, especially among the disadvantaged, citizens must not only be informed of the availability of the various programs but also be made aware of the benefits to be derived from their participation.

Local Financial Commitment in Meeting Urban Needs

Despite the fact that this plan calls for substantially increased financial aid to cities from both State and Federal governments, providing recreation opportunities for the Region's urban inhabitants is still basically a local responsibility. Like police and fire protection and sanitation, it must be considered an essential municipal service.

Local governmental agencies are thus left with the responsibility of providing adequate funds for their share in implementation of recreation programs and plans. The most serious problem facing city park and recreation departments today is allocation of sufficient funds for maintenance and staff. Many city parks have become recreation slums as the result of lack of proper maintenance of facilities. This situation does nothing but invite vandalism and contempt by people who might normally use and support such parks. Also, the lack of supervision has allowed many parks to degenerate into hang-outs for

delinquents and social deviates. These mounting problems of maintenance, administration, supervision and protection will require a degree of dedication and financial commitment on the part of local governments that has not been evident to date. New sources of income will be required to underwrite this commitment.

Local governments in Arizona and Nevada have constitutional limitations placed on their bonded indebtedness and property tax rates. These limitations should be substantially eased in order to allow local governments to make even greater use of their general obligation bonding authority, as well as property taxing authority, to match grants from the Land and Water Conservation Fund and other grant programs.

Expanded grant programs to local governments, as outlined previously, should facilitate the timely implementation of capital improvement programs for land acquisition and facilities construction. Capital improvement scheduling should be based on the following criteria:

1. Investment should be made in areas of greatest need as measured by the deficiency in recreation opportunity where the greatest social and economic return on the dollar will be gained.
2. A reasonably balanced program of both acquisition and development should be followed.

Acquiring the Recreation Resource

Probably the most difficult planning problem facing local governments is to determine the amount and location of recreation lands required for an adequate and desirable park and recreation program. Various standards have been suggested by authoritative sources concerned with park planning usually in the form of a ratio of acres per thousand population or a percent of total city area to be set aside for recreation. Unfortunately, these standards do not consider the use to be made of recreation lands, the type of activities planned or the possibility of multiple use. Local park and recreation departments should attempt to establish realistic goals tailored to specific community needs rather than accept theoretical standards. Such theoretical standards do, however, reflect relative deficiencies among urban areas throughout the State or Nation and thus can be beneficial for some long-range planning.

Location is the most critical factor to be considered when acquiring recreation acreage. Population density, availability of land and availability of transportation are the major determinants in the location of new city parks. The greatest need for parks and

recreation areas is in the densely populated areas where land costs are highest. If adequate facilities cannot be located where people most demand them, then fast, inexpensive public transportation should be provided to bring people to areas where costs allow such development.

Land acquisition is a big factor in any recreation program. Out-right purchase of lands for single-purpose recreation is preferred when little useful vacant land is available. Single-purpose recreation land purchases are made to forestall incompatible land uses in some instances. Unfortunately, the price of land in urban areas of greatest need is often prohibitively expensive. Local governments have not placed sufficient priority on recreation needs to insure successful competition with other land uses which provide a greater economic return.

With the proper State enabling legislation, cities and urban counties have numerous regulatory tools at their disposal for insuring either the acquisition or setting aside of land for recreation purposes. One of the most useful is the subdivision ordinance which can require the dedication of a certain percentage of the land to be subdivided for recreation use by the public (public in this case is usually defined to mean only subdivision residents). This provides local governments with a convenient, inexpensive means of acquiring recreation lands to keep pace with the urban population growth. Some subdivision ordinances allow the subdivider the option of a monetary payment in lieu of land dedication. However, the recreation land purchased with the payment may not directly benefit the subdivision residents.

Cluster or density zoning is a technique which allows for a type of planned unit development permitting the developer to build on smaller lots but requiring a certain amount of land to be dedicated to the public for open space or recreation. The overall density of a community or neighborhood would remain in agreement with the adopted area general plan, but the public is provided with new recreation areas at a rate consistent with the population growth.

Before adopting such zoning and subdivision controls, local governments must decide: (1) how such undeveloped land will be both preserved and maintained, (2) whether such open space should be dedicated to the local government for public use or whether it should be privately-owned and maintained, and (3) if privately-owned and maintained, whether by an individual or property-owners association.

The report Meeting Arizona's Current Outdoor Recreation Needs, prepared by the Arizona Outdoor Recreation Coordinating Commission in November 1969, as a supplement to the 1967 Arizona Outdoor Recreation Plan, points out that the State seriously needs adequate enabling

legislation for municipal planning and subdivision regulations together with a strengthening of zoning statutes. The major recreation-related needs deserving attention by the Legislature are flood plain zoning and a mandatory provision of land or in-lieu monies for schools and recreation areas in new subdivisions. The report goes on to suggest that the expansion of the improvement district as a financing vehicle for recreation land and facilities in developing urban areas be given serious consideration by the Legislature.

The present zoning ordinance for the city of Phoenix has provisions for "planned area development" and should be used for cluster developments at the base of the mountains while preserving the slopes for recreation and open space. Hillside development controls are urgently needed to prevent further abuses of mountain slopes.

The purchase of easements or partial rights to land has recently experienced some popularity as a means of providing recreation opportunities at less cost than "fee-simple" purchase of all rights. This technique should become much more widely used in the future and offers many possibilities for imaginative application, particularly on those land and water areas that do not involve the heavy on-site public usage typically found in conventional city parks.

Easements can be categorized into two general groups, affirmative and negative. Affirmative easements generally provide (or affirm the right) for limited public access such as a riding and hiking trail or fishing and hunting access. These easements have the advantage of providing public recreation opportunities at costs much lower than fee-simple acquisition while the land continues to produce tax revenue. Negative easements do not generally provide for public access. They restrict the uses to which a landowner may put his land, thus helping to preserve badly needed open space. Negative easements can be more effective than zoning regulations because the easement becomes a permanent endorsement to the deed, not subject to changes as is a zoning regulation. The use of easements has more application in urban areas where land prices and development pressures are greatest.

Natural resource zoning (similar in effect to a negative easement) should be used to protect marshes, tidelands, flood plains, agricultural lands, watersheds and other natural resources where they are serving urban demands. This zoning is a means of not only conserving the resources but also of providing limited recreation opportunities.

Flood plain zoning is especially valuable since it is a means of prohibiting or restricting development within flood plains to prevent property loss, insure human safety and allow the safe and natural flow of streams, while at the same time allowing for recreation which requires only limited facilities and thus little in the way of public financial commitments.

If fee-simple (full rights) acquisitions are necessary to preserve natural or scenic areas, the use of lease backs and sale backs should be given serious consideration. A public agency can acquire tracts of land and then lease them to private individuals for specific open space uses in accordance with the approved general plan for the area. The lands can produce rent for the public body as well as products and activities for the public, like farm produce and recreation opportunities.

Gifts or donations of land for parks and recreation purposes have been important in many cities, but acquisition in this manner cannot be relied on, nor, in many cases, is such land located where the real needs are. Transfer of title is another method of acquiring recreation land at little or no cost and usually involves the transfer of land surplus to the needs of one city department to that of the parks and recreation department. Lands acquired through tax liens, condemnation and reclamation of neglected or submarginal areas are other methods that have helped cities acquire land for meeting recreation needs.

Multiple Use, Under Use and Potential Use

The scarcity of undeveloped lands, particularly inner-city acreage, makes the acquisition of full, or even partial, rights to land for single-purpose recreation (especially single "activity" recreation) prohibitively expensive. To meet the long-range recreation needs of the metropolitan area economically, local governments should make greater use of joint development agreements for the multiple use of land and facilities.

Schools are generally located according to needs (population concentrations) and often become the central gathering place for residents of a neighborhood thus offering potential outdoor recreation opportunity. Agreements between city governments and school districts for the joint use of school facilities for recreation purposes should be encouraged. Under such a "joint powers" agreement, the school would have jurisdiction over all land and facilities during the school day while the parks and recreation department would utilize the facilities at night, on weekends and during holiday and vacation periods. By permitting the full-time use of combination school-park sites, park acreage requirements are reduced, needless expenditures for separate facilities are eliminated and a more efficient utilization of the limited number of trained recreation professionals available is realized.

Agreements, similar to these for the use of combination school-park facilities, can be worked out with the following agencies: public and private housing agencies in renewal and redevelopment projects; public transportation departments along freeway and rapid

transit rights-of-way (including air space above depressed routes and below elevated structures), public and private utility districts along their rights-of-way (below transmission lines and above underground cables); local irrigation, flood control and water supply districts at impoundment structures, along conveyance facilities (canals, aqueducts, etc.), and particularly on watershed lands in and adjacent to population centers; and other public, quasi-public and private agencies like airports, churches, fraternal organizations and service clubs.

The result of fostering such joint agreements for the multiple use of lands and facilities will be a net reduction in the amount of acreage that must be acquired in fee title by local governments.

To maximize the efficient use of the limited lands and facilities available for urban recreation, local parks and recreation departments must make greater strides in the innovative use and design of unused, under used and potential recreation sites. The under use of facilities due to their unavailability at night and on weekends (e.g. schools) is a situation that demands immediate attention. Larger staffs for supervision, protection and maintenance are required as well as proper night lighting and convenient, safe public transportation.

Creative use of small, isolated parcels of vacant land is needed including good imaginative design. Abandoned rights-of-way for hiking, biking and riding trails and surplus property leftover from freeway acquisitions (mentioned previously in the section on the State Role) offer good potential. Reclamation of abandoned dumps, quarries and fill projects present larger, albeit more expensive possibilities. Other possibilities include the following: an indoor swimming pool may be constructed partially underground and the roof used as a play lot; an outdoor wading and model boating pool by day may be drained and used for plays and dances at night; well-lit parking lots can be used at night, and possibly weekends, for general games and dancing; landscaped roof tops can be used as parks and playgrounds with exhaust fans and vent stacks designed as climbing apparatus; vacant lots, junk heaps and other littered areas can be leased for nominal sums from their owners, with the city taking over all liability, cleanup, clearing and installation costs, and thus beautifying run-down areas while providing neighborhood recreational facilities; little used side streets and alleys may be closed off to traffic, lighted and temporary facilities brought in; portable facilities could be set up on vacant, cleared lots awaiting construction projects; and "jogging" tracks can be constructed around existing parks and particularly around any available body of water.

Since sporadic recreation is considerably better than no recreation at all, a "mobile" recreation program using portable facilities

should be given greater emphasis. Temporary inflatable dams may be used on some creeks and streams during certain seasons (with proper caution) to create small boating and sailing lakes.

The Private Role in Meeting Urban Needs

Organizations and Clubs

Foundations, institutions and other organizations operating in health, welfare, education, religion and similar fields should accept a larger measure of responsibility for outdoor recreation of special types and for special categories of participants. These organizations are best equipped to provide such major types of recreation as organized group camping, day camping, nature study and recreation for the handicapped and the elderly.

Membership clubs should accept an increasing responsibility for providing land and facilities for special kinds of outdoor recreation activities, particularly golf, tennis, swimming, motorbiking, horse-back riding, sailing and other boating. To insure the proper impact on the satisfaction of urban recreation needs, the development and operation of facilities for such activities should be encouraged and facilitated by governmental agencies through assistance in location planning, demand research, zoning support and low cost leasing of public sites. Recreation facilities provided by membership clubs serve a different segment of demand than public facilities and should be expected to supplement, but not substitute for, public facilities of the same general types.

Commercial Enterprise

The report Meeting Arizona's Current Outdoor Recreation Needs indicates that private enterprise investment in outdoor recreation has increased tremendously in Arizona during the past five years. These private recreation suppliers provide professional sport facilities and a wide range of very special facilities, including horse, dog and auto racing, minor league baseball and major league training, hunting and shooting preserves, amusement parks and trailer campgrounds. These activities occur on public lands and sites leased to concessionaires as well as on private property. Private (profit-oriented) enterprises are not successful, generally, in those recreation fields where governmental organizations provide competitive developments and activities. This problem can be resolved by coordination in planning when the private sector is sought out and included in preliminary decision making. This kind of coordination can identify those functions best handled by private interests and they, in turn, would have more confidence to invest their money and abilities. Industry should continue to expand recreation programs for employees such as summer recreation programs and intra-mural sports leagues.

Private Open Space Opportunities

One of the major roles of the private sector within the urban scene is the provision of open space lands. Within the rapidly growing Las Vegas metropolitan area, where there are few large tracts of publicly-owned lands, this role will become of critical importance in the future.

Providing Class III recreation is integrally tied in with the plan for preserving open space in and adjacent to urban areas. This type of recreation involves "active" recreation entailing more than just setting aside agricultural and "natural" preserves. Activities taking place on these open space lands, lacking developed facilities, include hiking, nature walks, fishing, hunting, riding, picnicking and possibly some limited form of "primitive" camping.

Probably the surest way to induce private landowners to open up their lands to the public is through the use of tax incentives combined with a reduced-risk liability guarantee. All city and county governments should review carefully their present tax programs with the idea of devising more attractive tax benefits for those private landholders willing to enter into agreements allowing for public recreational use of their lands. The States should consider a special fund to enable the underwriting of liability and comprehensive insurance necessary to protect the landowners from both personal injury suits and damage to his property resulting from recreation use. Revenue for this fund could come from sales taxes on specific athletic equipment such as boats, motors, boat trailers, snowmobiles, campers, trail bikes and other off-road vehicles.

To become eligible for these tax and insurance benefits, the private landholder would submit to the local government having jurisdiction (with a copy to the State) a master plan indicating the extent of the recreational use to be allowed on the property and the minimum period of time said plan would remain in effect.

A "tax deferral" program appears to have the greatest merit as a tax inducement for private property owners. Under a tax deferral system, all taxes on land located within a planned or an existing open space site would be deferred as long as it remained in an open-type of land use (taxes on improvements would still be collected). However, if an owner of such a site decided to develop for a non-open space use, then all deferred taxes would have to be paid before a subdivision plan is approved or a building permit issued. Such a tax program as described above should be tied to other land use controls like zoning in order to be more effective.

Meeting Needs Outside Urban Areas

The basis for the distinction between urban needs and needs outside urban areas is the geographical location of the resource with relation to the population centers. It is not keyed to the origin of demand as such (i.e., urban vs. non-urban). However, in a Region like the Lower Colorado, where over 75 percent of the inhabitants live in urban centers, obviously, most of the recreation demand is generated by urbanites. It is generally the more affluent and mobile urban residents trying to escape the congestion and often sterile atmosphere of the city who exert the heaviest demand on these resource-based recreation opportunities. Out-of-State visitors also contribute significantly to the pressures being felt by the Region's prime outdoor recreation resources. By 2020, recreation requirements outside urban areas will represent 30 percent of the Regional total or 201 million recreation days annually. To meet this non-urban recreation need will require expenditure of \$795 million for development by the year 2020. An additional 111,100 acres will also have to be acquired at a cost of \$61 million.

The preponderance of these non-urban recreation activities occur at national and State parks, at developed recreation areas on the Public Domain and the national forests, and at a variety of private resorts, generally within close proximity to water (lakes, streams or reservoirs). These Class II and Class III areas form the basis for satisfying most of the unmet non-urban demand.

The Federal Role

Federal agencies are charged with meeting a major portion of these non-urban recreation requirements. Since little additional land will be acquired by these agencies, the satisfaction of needs will involve substantial future development on existing Federally-owned lands. This will necessitate the shifting of 1,874,000 acres within the Region by 2020 from multiple-purpose use (Class III) to single-purpose recreation use (Classes I, II, IV and V). This will alter patterns of use and involve reductions in some aspects of multiple use. Production-oriented use on these lands will be either reduced or eliminated in favor of recreation, wildlife or watershed management.

In those rural counties where recreation development has been slow in materializing, Public Domain lands represent a major resource. Under provisions of the Recreation and Public Purposes Act, a State, its political subdivisions or a non-profit association may lease (at \$.25/acre/year) or buy (at \$2.50/acre) Public Domain lands for public recreation purposes. Maricopa County has utilized this Act to lease 70,000 acres in the Phoenix metropolitan area to be eventually developed into a system of regional parks. The one major deficiency of the

Act is the 640-acre annual purchase limitation placed on entities other than the States. This limitation is unrealistic and inappropriate and should be altered to reflect the scale and character of present-day recreation needs.

Much of the public land in the Region having the highest potential for outdoor recreation is in the national forests. The section dealing with meeting urban needs indicated that much of this land exists close to or within the day use range of the Region's population centers. Therefore the highest priority should be given to meeting urban area recreation needs, followed by statewide and tourist needs.

In order to relieve overcrowding and loss of natural values within the national park and national forest areas, the managing agencies should coordinate their recreation programs through the development of such facilities as campgrounds, picnic grounds and overnight accommodations where the natural values will not be destroyed.



Camping at Woods Canyon Lake on the Sitgreaves National Forest (USDA, Forest Service, Southwestern Region).

All Federal agencies should diligently resist pressures for construction of additional facilities to accommodate the ever increasing visitor load whenever such developments are likely to result in overuse and the subsequent loss of unique natural values. To assist this effort, they should facilitate and promote the construction of visitor accommodations by other Federal, State and local agencies and private enterprise outside but adjacent to unique natural areas.

Federal agencies involved in flood control and soil conservation projects should design projects to gain maximum recreation benefits. The National Environmental Policy Act of 1969 (Public Law 91-190) requires that any environmental deterioration likely to result from project construction must be determined and reported.

Agencies involved in phreatophyte clearance and other vegetative management programs must carefully plan the projects to avoid the loss of important wildlife habitat, scenic, ecological, and outdoor recreation values. Standard criteria and a general methodology must be adopted for evaluating all resources in order that "other" values are identified along with the downstream benefits resulting from increased water yield. Giving full recognition to "other" resource values should prevent such values from being sacrificed at the expense of other benefits in terms of water yield.

The majority of the Region's military lands are found in the southern deserts, with bombing and gunnery ranges encompassing the most land. Under provisions of Public Law 84-46, Public Law 84-446 and 42 USC 1855-1855 g, these military installations should assist local communities financially and otherwise to meet demands on local recreation facilities resulting from off duty servicemen and their families. Public Law 90-465 authorizes the Secretary of Defense to carry out a program for the development and maintenance of public recreation at military reservations. This program has merit and should be pursued, particularly where it can help satisfy needs of recreation-deficient rural communities.

The State Role in Meeting Needs outside Urban Areas

The several states and the private sector will share the burden of satisfying the remaining non-urban recreation needs. Local governments, for the most part, will not play a significant role. Until recently, because of the very extensive and broadly distributed Federal lands and facilities, the States have not played a vital role in the provision of outdoor recreation. The Arizona Game and Fish Department is a notable exception.

There is a somewhat hazy dividing line of responsibility between the State parks systems and the Federal land management agencies. The States and Federal agencies similarly attempt to preserve segments

of the natural landscape and provide areas to meet weekend, overnight and vacation needs. For lack of a more defined policy, the land-ownership pattern would appear to be the primary determinant of responsibility. Because of the very extensive Federal landholdings the States should seek to complement, not substitute for, these Federal areas. The several states should give high priority to assisting local governments in meeting the mounting urban recreation problems of the Region.

The Arizona Outdoor Recreation Coordinating Commission, created in 1966 as a result of enactment of the Land and Water Conservation Fund Act the previous year, is primarily responsible for (1) on going state-wide recreation planning, and (2) processing of Land and Water Conservation Fund project applications. In addition, administration of the State Lake Improvement Fund was transferred to this commission from the State Parks Director in June 1968. The Arizona Outdoor Recreation Coordinating Commission is not a landholding, development or recreation operating agency. Providing advice and assistance to political subdivisions in organization of parks and recreation departments, conducting local recreation research programs and coordinating planning and development standards are important functions that should be assigned to this agency. However, a substantial expansion of staff and operating funds will be required for it to properly discharge these added responsibilities.

The staff and programs of the Arizona State Parks Board, which came into existence in 1957, will also have to be expanded significantly to enable it to effectively carry out all the functions delegated to it by law. The Parks Board should be the primary non-Federal agency responsible for the planning and administration of the recreation developments associated with the Central Arizona Project.

The report Meeting Arizona's Current Outdoor Recreation Needs stresses the importance of requiring the State Land Department to examine and classify all State-owned land, including school trust lands, according to their most appropriate long-term use. In determining State objectives, which are social and physical as well as economic, it must be recognized that the "highest and best" use is not always the one which provides the greatest dollar income. It is imperative that the present and potential values in terms of scenery, wildlife, recreation and other public uses be given equal consideration with economic return.

Additional recreation opportunities could be made available if the State Land Department would require grazing lessees of State land to permit public access for hunting, fishing, riding and similar recreation activities.

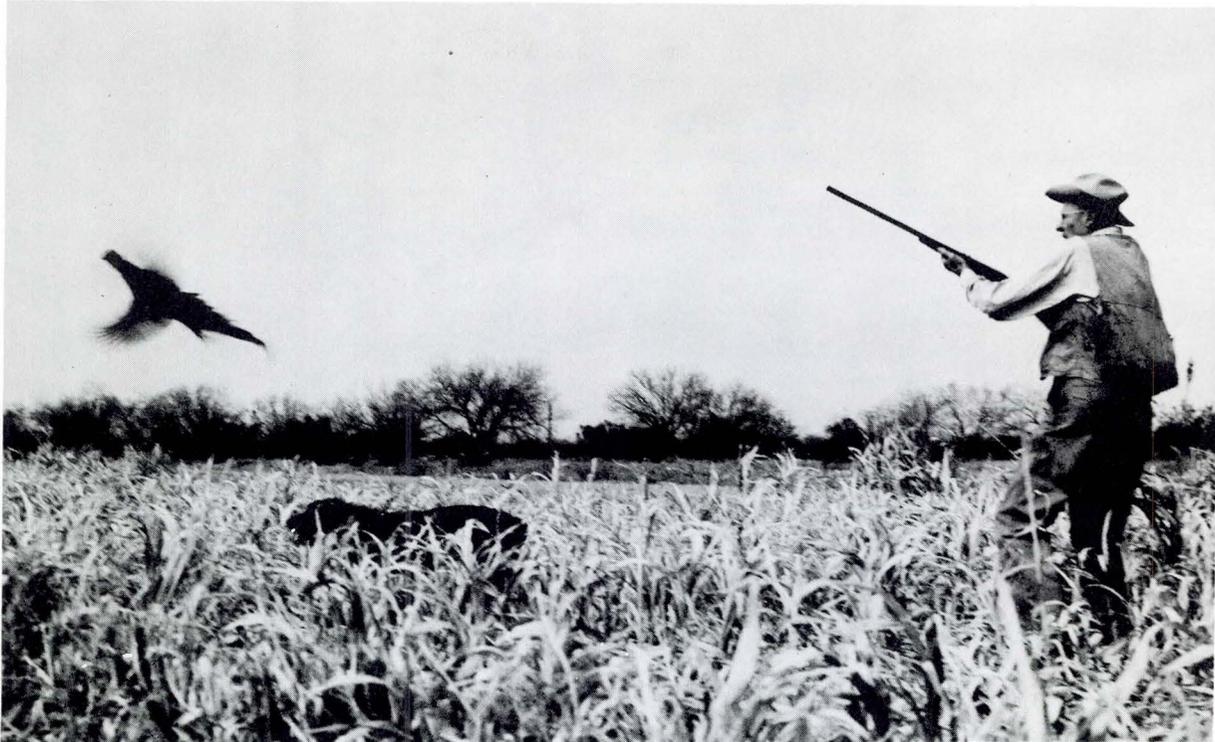
The Superintendent of Public Instruction should actively promote and provide guidance for the cooperative actions of school districts and local governments in the acquisition, planning, development and operations of combined school and recreation sites, buildings and facilities. This should prove extremely beneficial to those rural communities without the means and/or manpower to provide adequate separate facilities.

In Arizona, a State source of annual funding is badly needed to enable the State to meet the full range of recreation demand. Although the State Lake Improvement Fund provides stable financing for one major element of statewide recreation needs, the provision of consistent, continuing financing for all other elements is equally important.

Land acquisition is not a major problem to meeting non-urban outdoor recreation needs in Arizona. The State should concentrate on the construction, operation and maintenance of facilities. However, the State park system's present level of financing is inadequate to meet the State's responsibility in the field of outdoor recreation. Since General Fund appropriations permit fiscal flexibility and efficiency and allow the legislative and executive branches to exercise a high degree of control over the tax dollar, most governmental experts agree that all government activities should be financed from general tax revenues. Consequently, it is imperative that the State park system be given a share of the General Fund adequate to its tasks and commensurate not only with the growing importance of outdoor recreation to the creative use of leisure, but for the enhancement and preservation of the human environment.

Bond act borrowing should be used as a means of supplementing General Fund appropriations. However, the State of Arizona has a \$350,000 bonded indebtedness limitation. This constitutional provision, limiting general obligation bonds, would require that any State bond issue be self-liquidating revenue bonds. In order to use bond financing for other than self-sustaining projects (marinas, ski tows, etc.), the present bonded indebtedness ceiling must be raised significantly.

In Nevada, extremely conservative financial policies resulting in limited "pay-as-you-go" allocations by State and local jurisdictions have caused facility development to lag far behind public needs. As the Nevada State Outdoor Recreation Plan, Recreation in Nevada - Part I, makes clear, deficit spending--financing through the sale of bonds--is an essential requirement for a successful long-range capital improvement program aimed at developing the State's recreation potential.



Privately-owned lands provide recreation opportunities for the public and income for the owner (Soil Conservation Service).

The Private Role in Meeting Needs Outside Urban Areas

Involvement of the private sector in recreation offers an opportunity to provide additional recreation without large expenditures of public money. The development of private lands for recreation profit can take the form of totally committing land to recreation use such as campgrounds, resort areas, picnic areas, golf courses, swimming pools, fish ponds and others; or it can be but one facet of the multiple use of lands primarily committed to the growing of crops or some other farm or ranch activity. Examples of this latter type of multiple use are deer and duck hunting clubs, dude ranches, horseback riding and packing and several other seasonal or dispersed types of recreation.

Private capital has found that investment in recreation enterprises, if properly designed and with adequate customer demand, can provide good returns on investments. The private sector is actively soliciting new recreation ventures, some of which are far beyond the capabilities of most Federal and State agencies in size, scope and facilities. Surely much of the future demand for non-urban recreation, especially by the affluent, will and should be provided for by private capital, thus permitting public expenditures to be channelled to the growing needs of the less fortunate, especially in and near the urban centers.

New and emerging forms of recreation which require exclusive use of lands or other resources offer new and challenging avenues for private investments. These recently expanding recreational activities, many resulting from innovation in recreation equipment, include the following: sky diving; precision parachute jumping; gliding and sail planing; off-road vehicle racing utilizing trail bikes, "scramble" bikes, dune or rock buggies, four-wheel-drive vehicles and snowmobiles; "drag boat" skiing and boat racing; travel trailer caravans and "rallies"; and recreational airplane flying. The demands placed upon lands and other resources by such specialized activities should be evaluated in relation to the requirements of conservation and of the recreation activities.

Some form of public assurance or financial incentive is necessary to induce private investors to provide additional specialized areas and facilities for these new and emerging forms of recreation. Several means are available to the States to encourage private investment in recreation resources. Perhaps the most acceptable to the public is the provision of long-term, low interest loans taking advantage of the borrowing power of the States. A very good suggestion in A Plan for Outdoor Recreation in Arizona, by the Arizona Outdoor Recreation Coordinating Commission, is State sponsorship of a mortgage insurance program to assist Arizona in the development of more private outdoor recreation facilities on both public and private lands. A similar program in Maine provided revenue bonds mortgage insurance on loans to developers of private recreational facilities. Reducing or suspending property, business, income and/or corporation taxes would provide incentive for investment in recreation resources and such investment would reduce deficiencies in recreation opportunities.

Two separate but related kinds of capital assistance are available to private enterprise. The first is a lease or concession to private developers to provide certain services on public lands, a form well established in law and business practice. Good examples are ski resorts in the national forests, where developments are owned and operated by private individuals or corporations on long-term, closely controlled special use permits. In these cases, the private developer pays to the government a percentage of his profit for use on the land. Another similar example is the development of private facilities (boat marina, swimming beaches, etc.) around reservoirs or at national parks.

Public investment in recreation resources on private lands, with protective agreements for assurance of the public good is a second form of capital assistance to private enterprise. Legislation and fiscal prudence require the States to have a legal interest (e.g., lease, easement, etc.) in any lands on which public investment is made. Although successful in isolated cases, public agencies have been reluctant to become involved because of insufficient funds to develop the existing public lands and legal problems of public investment on private lands.

Indian Reservations

Tribal lands, held in trust by the United States, may be developed for a wide range of uses designed to strengthen the reservation's human resources. Indian reservations encompass some of the major scenic reserves of the Region; and in terms of outdoor recreation, the Indian tribes are just beginning to tap the potential of their diverse and dramatic land and water resources. The Economic Development Act is providing a means whereby tourist development projects can be funded jointly by tribal councils and the Federal government.

With respect to its outdoor recreation responsibilities, the Indian tribal government is unique. It is similar to a municipal government in its responsibility for providing active and passive recreation for reservation inhabitants. However, with the Indian tribes primarily interested in promoting the development and use of reservation lands which will result in greater employment and increased income for the Indians, the tribe more closely resembles the private recreation supplier.

The Arizona State Attorney General has ruled that an Indian tribal council may participate in the Land and Water Conservation Fund program, provided it resembles a municipal government in organizational structure and can meet required contractual guarantees. Indian facilities providing for such activities as hunting and fishing, trail rides and pack trips, camping, picnicking, boating, winter sports, summer home colonies and pageants are being expanded to accommodate the rising demand by non-Indians for these recreation pursuits.

The Indian Development District of Arizona, a non-profit State chartered organization formed in 1967, with a membership of 15 Arizona and 2 California reservations has been instrumental in assisting several tribes in developing recreational facilities to attract tourists and expand local employment opportunities. However, in order to benefit both Indian needs and Regional outdoor recreation objectives, it will be necessary for tribal councils to coordinate their recreation planning with that of State and Federal recreation agencies.

Within the near future, Indian reservations will afford outstanding opportunities for long-term private investment and concessionaire operations in many outdoor recreation activities. The development and operation of organized group camps for a wide variety of purposes, either directly by the Indian tribes or by lessees of reservation sites, should be strongly encouraged.

Needs for Unique Natural, Primitive and Cultural Areas

Lands classed in these categories are limited in availability by special characteristics that permitted such classification. Such areas cannot be created artificially, so demand for Class IV (Unique Natural) and Class V (Primitive) recreation experiences not met by the existing and potential supply of such lands must be satisfied on surplus Class III lands.

As people have moved into the cities, they have forgotten the skills and pleasures of solitude and solitary activities associated with primitive camping. Some people are afraid of solitude and the ordinary noises of the night. The apparent need to be close to others of similar interest established a trend toward larger campgrounds and massed facilities, as opposed to isolated, primitive and remote units.

However, the slow but inexorable increase in primitive camping will eventually require that we impose some form of control on use of our delicate back country resources. The character of the recreation experiences afforded by Classes IV and V areas are very dependent on the quality of the resource. Therefore, it is essential that the present low level of use be sustained to prevent overuse and consequent loss of the resource or at least its character. This control may take the form of rationing, perhaps to include a national or State lottery, leading to a waiting list.

The needs for wilderness areas (specially designated Class V lands), certain Class IV natural areas and cultural and historical sites (Class VI lands) have not been quantified in this study; however, these needs will be discussed in detail in the section dealing with "Special Areas".

Water - A Key Element

Surveys by the Outdoor Recreation Resources Review Commission found that the availability of water was a prime factor in the enjoyment of most outdoor recreation. Whether for a quiet stroll around the Cortez Park lagoon in Phoenix, a picnic beside Oak Creek, fishing in the Colorado River or a fast boat ride at Lake Mead, water is an alluring amenity. Any stream, lake, reservoir or canal can enhance recreation experiences. The actual effectiveness of water for recreation use, however, largely depends on four factors: (1) proximity to people, (2) suitability for recreation use, (3) physical and legal accessibility, both to water and the adjoining land, and (4) the provision of recreation facilities. Of these, proximity to population is the most significant.



Young and old alike enjoy the refreshing water at Boulder Beach in the Lake Mead National Recreation Area (Bureau of Reclamation).



Boys from the Orange County YMCA in California line-up for breakfast during a visit to Lake Mead (Bureau of Reclamation).

For the most part, the location of new water resource developments, which are usually remote from population centers, is inconsistent with the pattern of recreation needs. Water resource developments are usually undertaken in response to irrigation, power, flood control and water supply needs. Although recreation is frequently cited as an additional purpose of these projects, it is often subordinate to other concerns and purposes. Recreation, for instance, is not among the decisive considerations controlling the location of future projects. Further, it is rarely a dominant feature in the plan of operation of multi-purpose reservoirs. As a result, the period of greatest drawdown often occurs during peak recreation demand. Nevertheless, current study procedures used to justify water resource proposals entail consideration of recreation benefits. These benefits then contribute toward the economic feasibility of the project and reduce the costs otherwise attributable to its other purposes. Recreation is thus an important element in assessing the desirability and priority of many projects.

Before recreation benefits are attributed to new projects in remote areas, the possibility of providing water-oriented opportunities near Phoenix and Tucson should be explored. Las Vegas is fortunate in having Lake Mead within a short drive of the urban center. Large water projects located in remote sections of the Region will contribute little towards meeting priority urban needs. They will receive use and provide benefits, but the question is one of comparing the equities of recreation investment in areas where needs are greatest against those areas where needs are slight. Only when evaluation confirms pressing needs should recreation benefits be attributed to new projects.

Federal Water Project Recreation Act

The Federal Water Project Recreation Act of 1965 (Public Law 89-72) provides for recreation and fish and wildlife enhancement as a project purpose in Federal multi-purpose reservoirs. The Federal government will pay all joint project costs and 50 percent of the separable costs allocated to these enhancement facilities, while the remaining separable development costs and the burden of operation, maintenance and replacement must be borne by a non-Federal public entity. In the absence of an indication of intent by non-Federal entities to administer the enhancement facilities, only the minimum basic facilities necessary to protect life and health can be provided as project costs. The lands required to protect recreation, fish and wildlife potential of the project may be acquired and retained for 10 years after construction. During this time any non-Federal agency may agree to share costs and the enhancement facilities will be built. For reservoirs constructed before passage of the Act, the Secretary of the Interior may allot up to \$100,000 per project on a 50-50 cost sharing basis to provide needed facilities.

There may be numerous reasons why a non-Federal public entity is not willing to enter into a cost sharing agreement for enhancement facilities. This report considers two of those reasons: (1) non-Federal entities may be unwilling or legally unable to spend recreation dollars in areas away from high priority needs and (2) non-Federal entities may be unable to provide adequate matching funds. In both cases the results are identical--no recreation enhancement development beyond the facilities necessary to protect health and safety.

There is a great measure of justification for non-Federal agencies to avoid recreation expenditures in low priority areas. As this report indicates, there are high priority needs in the urban areas as well as preservation needs which can only be satisfied through large expenditures of money. These priority needs are reflected in the State outdoor recreation plans which must be considered in assessment and assignment of recreation benefits. There may be water projects justified by a favorable cost-benefit ratio in the absence of recreation benefits. These reservoirs, located in low priority areas of recreation needs, receive recreation use simply because many recreationists are attracted to areas where low density use is expected. In some instances, this use can be said to have been transferred from other bodies of water and other facilities and, therefore, is not truly a benefit. Where possible, some provision for basic minimum recreation needs should be provided as a project cost based on this transfer of use to the new project.

Reservoirs not satisfying priority recreation needs at the time of development may become important during a later time frame. It is therefore necessary not only to provide basic facilities for present use, but also to insure the project's recreation integrity for the future. The law presently does not provide this integrity for time frames beyond 10 years. It is recommended that this provision be modified to secure these lands for the life of the project.

When non-Federal agencies are willing to enter into a cost sharing agreement but unable to raise the necessary funds there should be some mechanism for increasing the Federal share of the enhancement facilities cost. Any increase in the Federal share should recognize areas of high priority needs, existing recreation facilities which would be destroyed by the project and degree of use by people from areas outside the non-Federal agency's jurisdiction. It should be noted that the opposite may also be valid: Federal participation in enhancement facilities not satisfying priority needs could be less than 50 percent. It is suggested that a sliding scale of Federal involvement would make the program flexible and somewhat more responsive to recreation needs.

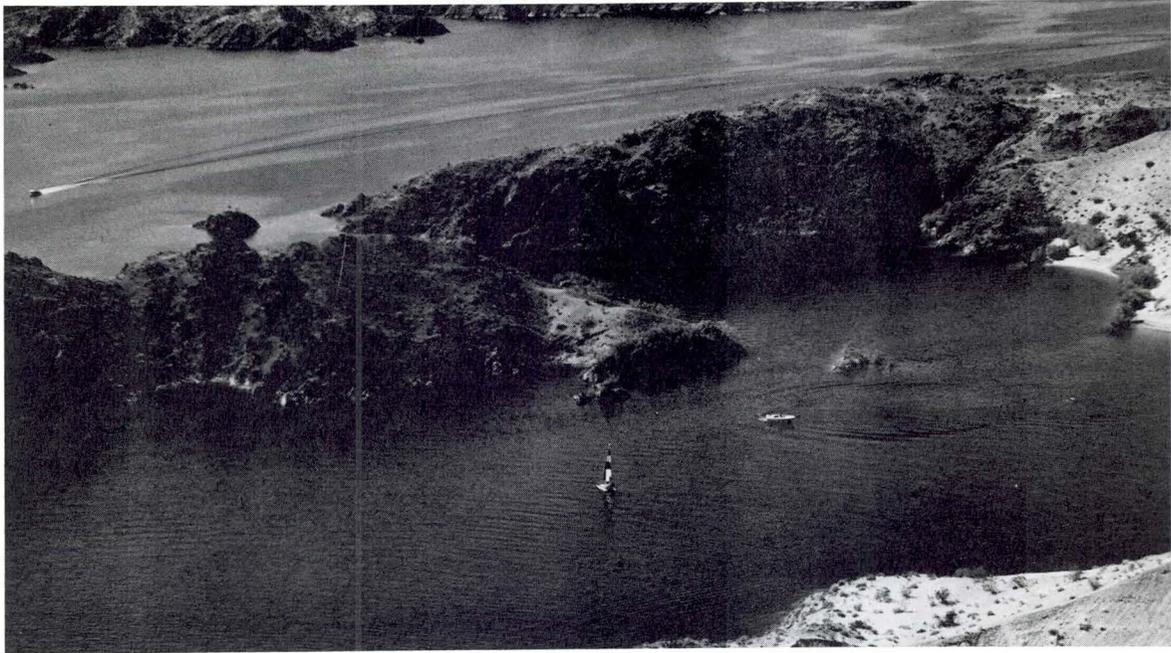
A sliding scale could also provide an incentive for environmental amenities adjacent to a reservoir project. In this case, provisions for amenities, such as open space zoning, natural areas or greenbelts, could decrease the required degree of non-Federal participation.

Development of facilities at existing lakes and reservoirs many times offer the best potential for meeting recreation needs. Many of these bodies of water are ideally located near population centers. Public Law 89-72 provides for enhancement facilities at existing Department of the Interior projects on the same 50-50 basis as new projects. Unfortunately, the law limits Federal participation to \$100,000. Greater flexibility is needed and the limit should be raised accordingly. The same problems discussed under new construction regarding cost sharing agreements apply to existing projects. A similar sliding scale of Federal participation should be implemented. In most instances, operation, maintenance and replacement costs dwarf the costs of acquisition and development. It would seem that a non-Federal agency willing to support operation, maintenance and replacement costs may be paying its fair proportion of overall costs in many instances.

Existing Lakes and Reservoirs

As pointed out above, among the alternative possibilities, development of facilities at existing lakes and reservoirs offers the most promising potential for satisfying recreation needs. On those reservoirs and lakes owned and administered by non-Federal interests, every effort should be made to encourage recreation development by other means including Federal and State financial assistance. Most financing will be by private capital; however, use of the Land and Water Conservation Fund monies and State grant funds may be justified, if developments are placed according to location of needs.

In the Lower Main Stem Subregion, the Lower Colorado River Land Use Plan is providing guidance to planners and administrators for developing recreation along the Colorado River. The inventory of water acreage available and suitable for recreation did not include rivers or streams less than one-eighth mile in width; therefore, with the exception of the various impoundments along the main stem, much of the water acreage of the river does not appear in the existing area inventory. With the inclusion of all of the river acreage in the potential water surface available for recreation, there is no deficit in water supply. The major problem for meeting needs in the Lower Main Stem Subregion is providing public access along the river. The Land Use Plan has considered this problem. As long as the recreation developments can be planned and constructed as indicated by the various cooperating agencies, the water-based recreation needs of the Lower Main Stem Subregion can be satisfied.



Lake Mohave formed by Davis Dam provides many water-based opportunities. (Bureau of Reclamation)

The first step in satisfying water-based recreation needs for the Gila Subregion is to provide better access to the existing reservoirs and lakes within the Subregion. Maricopa County has master-planned the development of Lake Pleasant Regional Park which lies northwest of Phoenix about 40 miles. The park contains 5,700 acres, of which 2,230 is water. It is estimated by the Maricopa County planners that Lake Pleasant Regional Park will accommodate 40,000 recreationists at any one time when fully developed.

Recreation Reservoirs

Reservoirs are rarely provided for recreation purposes alone. Since multi-purpose reservoirs are infrequently located where the recreation needs are greatest, a single-purpose reservoir offers a most promising means for satisfying recreation needs. In fact, small single-purpose recreation reservoirs (or at least reservoirs with recreation as the paramount purpose) and swimming pools distributed equitably within easy travel time from urban centers may best meet recreation needs. Such reservoirs might not accommodate speedboating or water-skiing, but given proper planning and well-designed facilities, they do provide for a variety of other experiences, including swimming, fishing and other boating as well as attendant picknicking, camping and hiking in many instances. Aquatic parks developed around canal side lagoons are certainly among the most attractive examples

of such single-purpose recreation facilities. Legislation should be considered to allow Federal agencies to construct recreation reservoirs on a shared cost basis with local interests where the need for such facilities can be demonstrated.

Presently Authorized Projects

In the Gila and Little Colorado Subregions, where there is a need for additional water-based recreation opportunities, an authorized project that includes recreation as a project purpose should probably be considered as satisfying recreation needs. Alternatives that might better meet needs should still be considered, particularly if these alternatives are better located with respect to population.

The authorized Central Arizona Project, which will import water into central Arizona from the Colorado River will provide new recreation opportunity along its route. Planning for the project, which is now in progress, contemplates recreation development along the aqueduct route and at certain impoundments connected with the project. Satisfaction of water-based recreation needs near Tucson is of particular importance. Priority should be given to water project development in this area if such projects include recreation as a purpose.

Since the Central Arizona Project also will skirt Phoenix, recreation planning for the project is being coordinated closely with city, county, State and Federal agencies. A dam and reservoir planned for construction below the confluence of the Verde and Salt Rivers will provide a water-based recreation mecca for boaters and water-skiers.

Waterway Recreation

The potential recreation afforded by the Region's waterways offers additional alternatives to reservoirs and lakes. The value of establishing greenbelts and recreation areas along the Region's waterways has long been recognized. The potential of this resource was discussed in the section "A Case for Open Space". A linear river parkway allows access at several points, serves different areas along its route and affords varying recreation opportunities. A canal or stream unifies the parkway as a common feature providing both a focus and possible corridor for access to different parts of the park. The wild, scenic and recreation values of streams are discussed fully in a later section of this report. The advantages of such parkways are particularly evident in cities where a stream or canal can integrate open space and recreation facilities with settlement patterns.

An outstanding example of such a waterway-oriented parkway is the proposed Rio Salado Project along the Salt River through Phoenix (see page XII-33). In addition to helping to meet water-based and water-enhanced recreation needs, such potential parkways--even where



Teenagers enjoying a day of fishing at Cottonwood Cove, located on the Colorado River below Hoover Dam (Bureau of Reclamation).

stream courses are intermittent--can serve to guide settlement and development of flood plains in economic and physically desirable ways. Among the latter greenbelts is the Gila River below Phoenix, which has been set aside by the Bureau of Land Management. Such flood plain regulation and zoning, which is now required by the National Flood Insurance Act of 1968, might greatly alleviate flood damage and its associated problems, while at the same time enhancing the environment by providing valuable recreation and open space benefits. The Outdoor Recreation Resources Review Commission in its report, Outdoor Recreation for America, expressed this potential as follows:

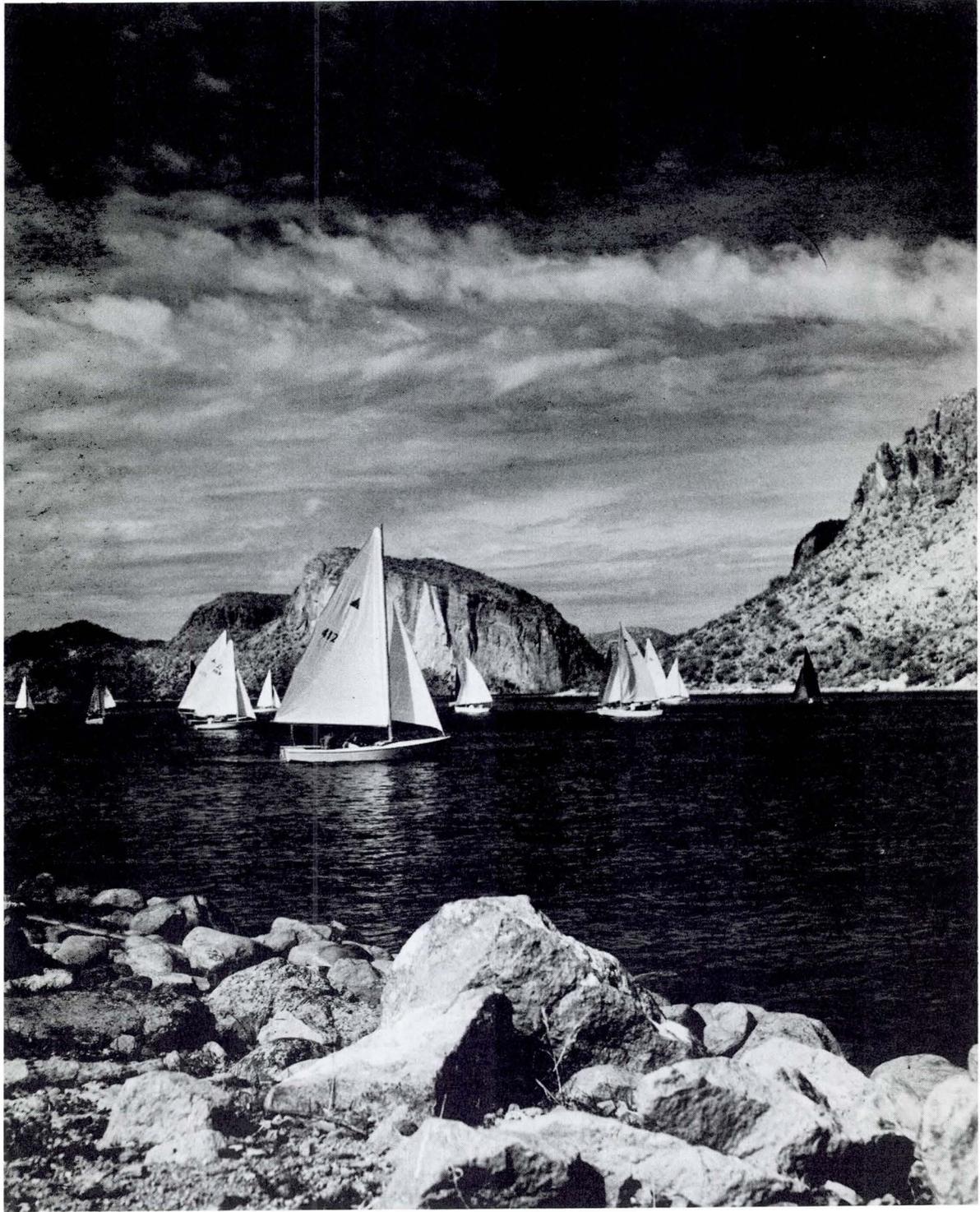
"Many attractive areas along our rivers and streams are lost for outdoor recreation by default. Some are subject to intermittent flooding and, therefore, present substantial problems. The attractiveness of these sites for residences or their location along navigable waterways often brings about pressures for their protection from floods by dams, levees or channel improvements. In some instances, these improvements are necessary and warranted. In many cases, however, it may be more economic and efficient from a public point of view to restrict the use of flood plain areas to purposes like outdoor recreation which require only limited development and which is not frustrated by periodic floods."

Canals and diversions, private and semi-privately owned, can provide recreation opportunities in water-short areas. Liability, pollution and structural problems generally discourage owners from allowing and developing recreation activities on these properties. By easing the legal and physical restraints, more resources could become available, with appropriate supervision and safety, for trails, outdoor education sites, water sports and other recreation activities, especially in urban and low income areas where the need is the greatest.

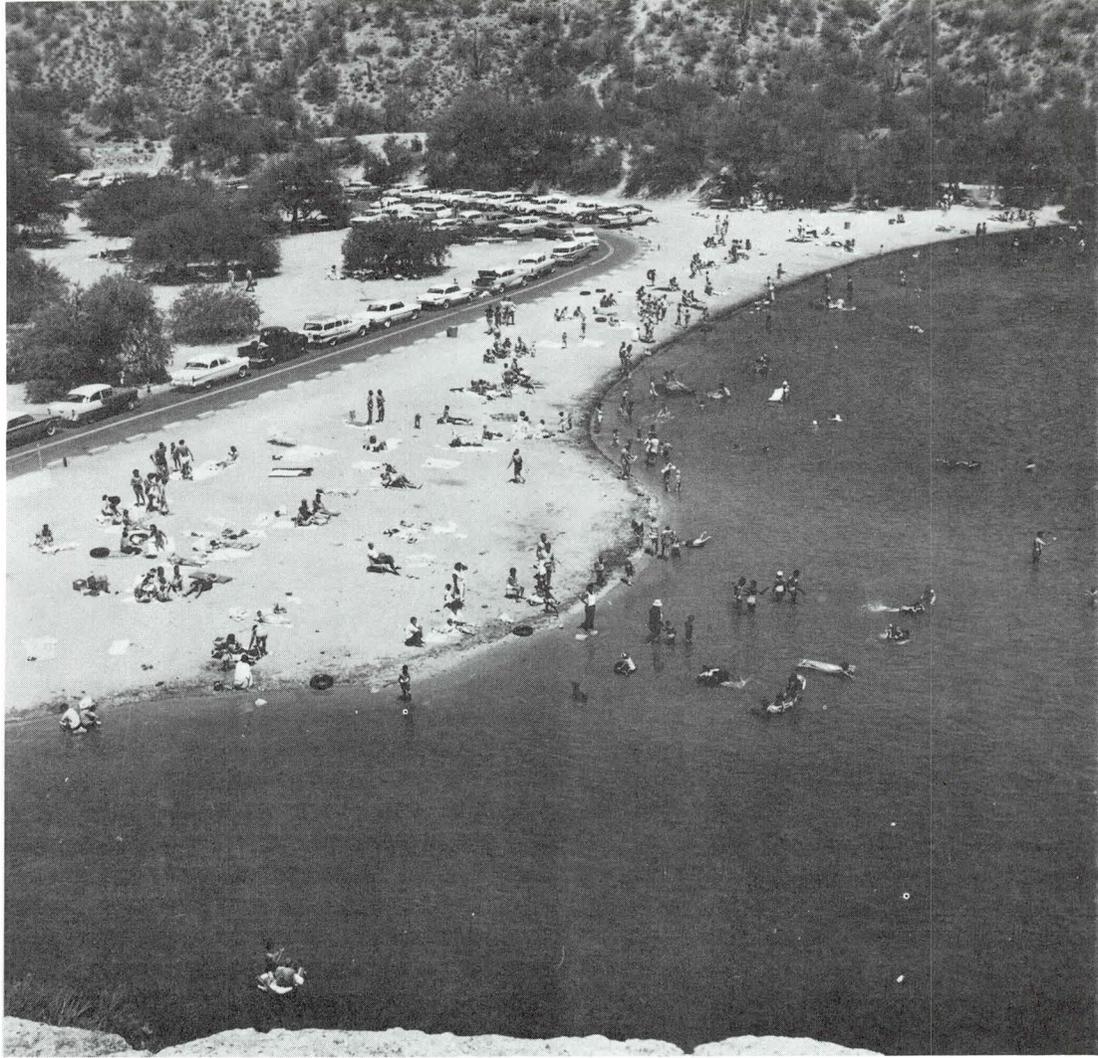
Public Swimming Pools

The demand for swimming alone can probably be satisfied more effectively by the construction of large public swimming pools, rather than single-purpose reservoirs. This would allow for a greater return on the public dollar, particularly since swimming has the highest participation rate of all water-based recreation activities.

A vital ingredient in any program for building recreation reservoirs and swimming pools to satisfy urban water needs is the provision of inexpensive and convenient public transportation to such sites. This has the dual function of enabling more people (particularly the urban disadvantaged) to take advantage of the increased opportunities available, while requiring less acreage to be set aside solely to accommodate the private automobiles.



Sailing on Canyon Lake, part of the Salt River Project, near Phoenix, Arizona (Salt River Project).



Swimming and picnicking at Butcher Jones Beach on the Salt River Project's Saguaro Lake (Salt River Project).

New Management Techniques

The provision of additional water acreage is only one aspect of the plan for meeting water-based recreation needs. Better management practices, greatly expanded facilities and improved pollution control are equally important considerations. Agencies responsible for planning, construction and administration of water impoundments have made significant progress in the past few years in recognizing and alleviating problems and developing innovative methods of providing increased recreation under less than optimum conditions. Much additional progress is needed in the future, however, to realize the full potential of water impoundments for recreation use. Some of these problems are discussed in the following paragraphs.

Planning and providing for facilities including swimming beaches, boat ramps, marinas and others is difficult at those reservoirs experiencing drastic seasonal or cyclical drawdowns. Multi-purpose reservoirs designed for maximum storage many times have steep foreshore and back-shore terrain that are hazardous for recreation use. Sudden water releases at power projects can create very dangerous conditions for downstream recreationists. Early season debris also creates hazardous conditions for boaters, water-skiers, fishermen and swimmers. Related land areas suitable for facility development in many cases cannot be developed or used because of the lack of access roads; therefore, the ultimate recreation capacity of these waters and related lands cannot be achieved until such time that new roads are constructed.

Aquatic plant life is essentially confined to the shallow margins of a lake or reservoir, which are precisely the areas most drastically affected by fluctuations in water level. There will be no large aquatic plants along the margins of reservoirs having water fluctuations of more than 10 feet during the growing season. Since these plants comprise an important source of food and habitat for many species of fish, waterfowl and water-oriented birds, their absence or destruction can seriously curtail the wildlife and recreation values of reservoirs. Fluctuation, especially if rapid, may have a deleterious effect on bottom fauna, of great importance as fish food.

A solution to the problems associated with erratic drawdowns, would be the construction of two smaller "tandem" reservoirs rather than a single large one. One reservoir would be maintained with a relatively stable pool and used primarily for recreation purposes, while the other would accommodate the severe water level fluctuations associated with irrigation, flood control and power uses. Such a project would have the additional advantage of enhancing the downstream (below dam) recreation potential also, since an effective program of stream flow management (elimination of flood - drought extremes of flow by regular releases of water) can be implemented with little or no adverse effect on reservoir recreation use.

Such an operation obviously would entail a greater overall project cost and, therefore, more benefits (as well as costs) would have to be allocated to recreation. Today, with the rapidly expanding popularity of water sports, and the acknowledged social benefits of recreation in general, there seems to be little reason for not allocating a greater share of project development to recreation.

This concept of single-purpose recreation reservoirs also applies to small stable subimpoundments in or adjacent to large fluctuating multi-purpose reservoirs. This technique provides a stable water surface conducive to optimum swimming conditions. The additional costs involved may well be offset by decreases in facility costs over a fluctuating situation and higher recreation use, both in value and total amount.

Recreation Use of Reclaimed Water

Reuse of reclaimed water from sewage treatment processes has many potential uses, including recreation. Location is an important factor; sewage is produced where the people are. Golf courses located adjacent to sewage treatment plants, for instance, could use water for irrigating turf. Recreation lakes have been created using sewage effluent.

An example of waste water reclamation for recreation purposes is the proposal to develop a 1,000-acre regional park along the west bank of the Santa Cruz River outside Tucson. By using municipal and industrial effluents, the city hopes to create a chain of five lakes and irrigate turf for golf courses and playing fields. In addition, a municipal zoo and other recreation attractions are planned. The city is now attempting to get financial assistance for the project through the Arizona Lake Improvement Fund and the Federal Water Quality Administration.

Tucson has also undertaken an innovative project to use non-potable water to create a recreation lake. Originally, this ground water was pumped for agricultural use, but it became too saline. Once the problem of seepage at the reservoir site is solved, a 10-acre reservoir, known as Kennedy Lake, will be available as a much needed local recreation resource.

SPECIAL QUALITY AREAS AND NEEDS

Special areas and needs are those outstanding natural and cultural features of irreplaceable value which are significant to man in his search for quality in life. Why man must preserve these features and how he can go about it are important questions which must be answered.

If the essence of ecology is the interrelationship of all living things, then we must recognize natural and cultural values as part of the larger whole. As long as man continues to assault the environment upon which his existence depends, a threat exists to these special values. Even the continued existence of man may be threatened. Many of our special areas have been lost and the environmental degradation and resource depletion continue. While the degree of seriousness of the problem is a matter of disagreement among individuals, most will agree that this environmental degradation must be stopped.

The special areas which concern this report serve several valuable purposes. They provide the base for a continuing study of where we have been and where we are going, and of what we have done and what we can do. Special areas are living examples of our past which provide a basis for restoring our spirit and escaping from the complexities of modern society.

The National Environmental Policy Act of 1969 (Public Law 91-190) provides a basis for anticipating and preventing environmental degradation. It is not a panacea, but the fact that such a policy is needed indicates the scope and seriousness of the problem. The Act declares it to be National policy that we strive to achieve a standard of excellence in our relationship to our physical surroundings. All Federal agencies are directed to interpret and administer existing laws and regulations in accordance with the Act. A three-man Environmental Quality Council is established under the Act to review government programs, recommend environmental policy and aid the President in preparing a required annual environmental report. The President's report covers the adequacy and status of natural resources, program review, and suggested remedies.

Other legislation has been directed towards the preservation of lands in their natural state. The National Park System, Wild and Scenic Rivers System, and Wilderness System are just a few of the programs attempting to preserve our natural areas. When added to the programs designed for public outdoor recreation (National Recreation Areas, National Trail System, etc.) we have a framework for acquisition and maintenance of special areas. The rate at which natural areas are disappearing indicates that we must accelerate our acquisition programs.

The attitude that our resources are inexhaustible can be changed through education. The National Park Service has undertaken two educational programs, the National Environmental Education Development program (NEED) and a nationwide network of Environmental Study Areas (EPA's) within the National Park System. NEED's goal is to foster an appreciative environmental awareness in our youth through an understanding of natural and social interactions in National Parks. An EPA is an environmental laboratory designed primarily for day use by school children to relate the individual to his world through concepts such as interdependence, varieties, similarities, patterns, adaptation and change. The guidelines provided at study areas can be used by all interested individuals of all age groups. There are numerous other possibilities for public environmental education such as television, adult night school and information publications.

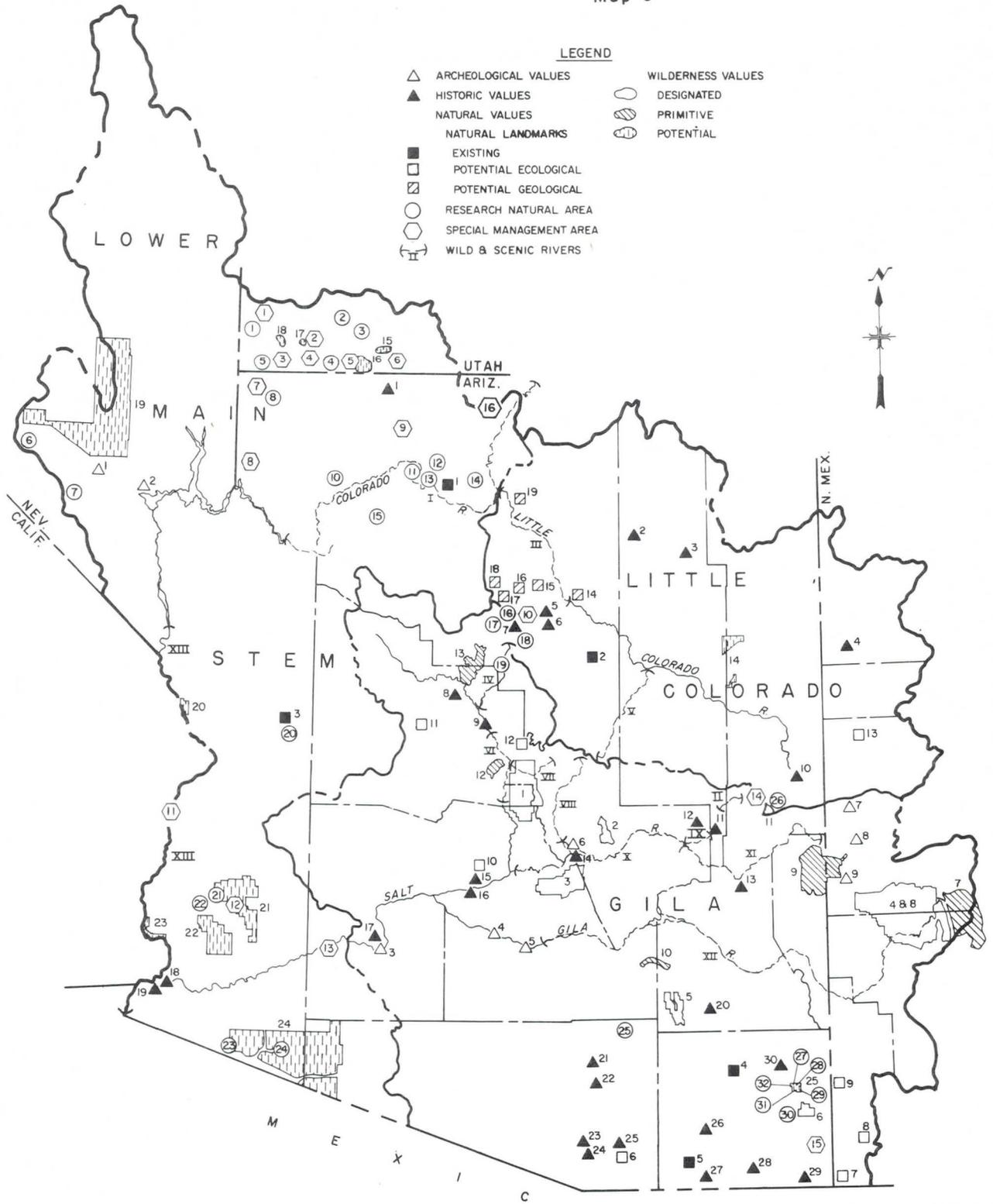
The program for the future should embody legislation, education, land acquisition and control, and citizen action group participation. Legislation provides a legal basis for preservation, but the process is slow and can be cumbersome. Effective education can counteract the lack of understanding of preservation needs; however, the effort of educating youth is also a long-term process. Methods such as zoning, acquisition, easements, and tax advantages can be more immediately effective, but they are vulnerable to local economic conditions. Local citizen action groups can play an important role in saving our diminishing natural and cultural areas. To have a truly effective program all of these processes must continue simultaneously.

Natural Values

The Lower Colorado Region contains some of the west's more beautiful and interesting natural features. These resources are very valuable from a recreation standpoint because they offer the opportunity to combine learning and healthy exercise in surroundings that are often visually spectacular. Some of these features are protected in the Region's parks and monuments; however many of the less famous natural features are vulnerable to destruction through development or overuse.

The framework for protection already exists for wild and scenic rivers, wilderness, and scenic trails and highways, however the problem of financing and inclusion within a system still remains. In other cases, a framework of recognition exists, such as the National Registry of Natural Landmarks and Special Management Areas. This does not guarantee preservation by statute although many of the natural features might be worthy of protective legislation. The following sections outline some of the programs now underway and, where applicable, give recommendations for measures to strengthen the programs or proposes specific natural features which should be considered for inclusion within a national or state system.

Map 3



- LEGEND**
- △ ARCHEOLOGICAL VALUES
 - ▲ HISTORIC VALUES
 - NATURAL VALUES
 - NATURAL LANDMARKS
 - EXISTING
 - POTENTIAL ECOLOGICAL
 - ▨ POTENTIAL GEOLOGICAL
 - RESEARCH NATURAL AREA
 - SPECIAL MANAGEMENT AREA
 - ⎓ WILD & SCENIC RIVERS
 - WILDERNESS VALUES DESIGNATED
 - WILDERNESS VALUES PRIMITIVE
 - WILDERNESS VALUES POTENTIAL

COMPREHENSIVE FRAMEWORK STUDY
 LOWER COLORADO REGION
 SPECIAL AREAS
 MAP NO. 3
 20 10 0 20 40 60
 SCALE IN MILES
 JUNE 1970

Wild and Scenic Rivers

In response to the increasing loss of natural free-flowing streams to both development and pollution, Congress enacted the Wild and Scenic Rivers Act, which became Public Law 90-542 on October 2, 1968. Belatedly, but assuredly, it was recognized that our rivers, no less than our mountains, deserts and beaches, had an important role to play in improving the quality of our environment and our leisure. In that Act, Congress declared that:

"...certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreation, geologic, fish and wildlife, historic, cultural or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations."

The Act recognized the diversity of rivers and has provided for three classifications of rivers within the system. These classifications take into consideration the physical and esthetic characteristics of a river and prescribe an administrative policy and a public use pattern that conforms to those characteristics. The classifications are:

Wild Rivers - Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shore lines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

Scenic Rivers - Those rivers or sections of rivers that are free of impoundments, with shore lines or watersheds still largely primitive and shore lines largely undeveloped, but accessible in places by roads.

Recreation Rivers - Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shore lines, and that may have undergone some impoundment or diversion in the past.

A reach of a river could be classified as a wild river with a separate reach of the same river flowing through a more populated and developed area being classified as a scenic or recreation river. Many of these proposed free flowing rivers and streams within the Region are in direct or indirect conflict with various proposals for water developments and flood control. These conflicts cannot be solved without intensive investigations, studies, and research. All values including the humanities, economics, natural resources, the environment, etc., must be given equal consideration and validity.

Section 5(d) of the Act requires the Secretaries of Agriculture and Interior to determine what additional stream segments have potential as wild, scenic or recreational rivers. Identification as a 5(d) river does not preclude the management and beneficial development of the river. It does, however, require that Federal planning and feasibility studies include an evaluation of the river's potential wild and scenic qualities as an alternative to development. This list will also provide the basis for selecting additional streams for preservation either at Federal or State level. The following rivers and stream stretches in the Lower Colorado Region are recommended as having potential for inclusion within the National Wild and Scenic Rivers System. All three types of streams...wild, scenic and recreation...are listed:

(Roman numerals refer to Map 3)

- I Colorado River - Glen Canyon Dam to Lake Mead
- II North Fork Diamond Creek
- III Little Colorado River - Grand Falls to confluence with Colorado River
- IV Oak Creek - source to confluence with Verde River
- V Chevelon Creek
- VI Verde River - headwaters of Horseshoe Lake to confluence with West Clear Creek
- VII East Verde River
- VIII Tonto Creek
- IX White River
- X Salt River - source to Stewart Mountain Dam
- XI Black River
- XII Gila River - source to Florence
- XIII Colorado River - Davis Dam to International Boundary (particularly Topock Gorge and Imperial Division)

Wilderness Values

Other sections of this chapter dwell on the need, as expressed through legislation, for preserving natural and historical values. The enactment of Public Law 88-577, the Wilderness Act, reinforces this commitment to preserve some of these values. Section 2 of this Act best expresses its purpose and intent:

"In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness."

The Act defines what wilderness is and should remain as follows:

"A wilderness, in contrast with those areas where man and his own works dominate the landscape, is an area where the earth and its community of life are untamed by man, where man himself is a visitor who does not remain. An area of undeveloped Federal land retaining its primeval character and influence without permanent improvements of human habitation, which is protected and managed so as to preserve its natural condition and which generally appears to have been affected primarily by the forces of nature with the imprint of man's work substantially unnoticeable; has outstanding opportunities for solitude or a primitive and unconfined type of recreation; has at least 5,000 acres of land or is of sufficient size as to make practical its preservation and use in an unimpaired condition; and may also contain ecological, geological or other features of scientific, educational, scenic, or historic values."

Present legislation does not provide for the designation of wilderness on lands administered by the Bureau of Land Management. Thus, before proposed as wilderness, the lands must be withdrawn from Bureau of Land Management jurisdiction. In order to preserve any existing wilderness values on these lands, this report recommends that the Wilderness Act be amended to provide a review procedure by which proposals for inclusion of BIM administered lands can be submitted to Congress. Among the BIM areas with wilderness values is the Aravaipa Canyon Primitive Area.

The wilderness areas in the Lower Colorado Region which have already been designated under the Act now include:



Designated

(Symbol and numbers refer to Map 3)

	Name	Subregion	Acres
1	Mazatzal Wilderness	Gila	205,346
2	Sierra Ancha Wilderness	Gila	20,850
3	Superstition Wilderness	Gila	124,140
4	Gila Wilderness	Gila	433,916
5	Galiuro Wilderness	Gila	52,717
6	Chiracahua	Gila	18,000

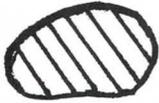
In addition, the following primitive areas are being studied to determine their suitability for inclusion into the Wilderness System, or have been proposed for inclusion.



Riders in Superstition Wilderness with spectacular Weavers' Needle in the background (USDA, Forest Service, Southwestern Region).



Exploring the Gila Wilderness on horseback (USDA, Forest Service, Southwestern Region).



Primitive

(Symbol and numbers refer to Map 3)

	Name	Subregion	Acres
7	Black Range**	Gila	169,984
8	Gila (both) (designated and primitive)**	Gila	132,788
9	Blue Range***	Gila	211,470
10	Aravaipa Canyon*	Gila	5,667
11	Mt. Baldy****	Little Colorado	7,400
12	Pine Mountain***	Gila	16,399
13	Sycamore Canyon***	Gila	49,590

* BIM lands designated as primitive areas by Secretary of the Interior.

** National Forest

*** National Forest which have been proposed.

**** Included in the Wilderness System by 91st Congress.

The following areas should be studied as potential wilderness. This list does not include all areas which have potential for inclusion within the System.



Future Study

(Symbol and numbers refer to Map 3)

	Name	Subregion	Acres
14	Petrified Forest National Park (portions)	Little Colorado	50,260
15	Virgin River Area	Lower Main Stem	5,500
16	Canaan Area	Lower Main Stem	8,000
17	Cottonwood Canyon Area	Lower Main Stem	9,800
18	Red Mountain Area	Lower Main Stem	12,440
19	Desert Wildlife Range	Lower Main Stem	665,000
20	Lake Havasu National Wildlife Refuge	Lower Main Stem	17,000
21	Kofa Game Range	Lower Main Stem	202,000
22	Castle Dome	Lower Main Stem	125,000
23	Imperial National Wildlife Refuge	Lower Main Stem	12,000
24	Cabeza Prieta Game Range	Lower Main Stem	624,000
25	Chiracahua National Mon.	Gila	4,685

National Registry of Natural Landmarks

The Historic Sites Act (Public Law 74-292, August 27, 1935) provides recognition of natural areas by dedicating them as Registered Natural Landmarks. This program does not involve a change in

landownership or administration or provide financial assistance for operation or maintenance. The Federal government seeks only to give these important areas a degree of national recognition.

Natural Landmarks (Existing)  (Symbol and numbers refer to Map 3)

1	Kaibab Squirrel Habitat	Arizona
2	Barringer Meteor Crater	Arizona
3	Hualapai Valley Joshua Trees	Arizona
4	Willcox Playa	Arizona
5	Ramsey Canyon	Arizona

Ecological Areas (Potential Additions)  (Symbol and numbers refer to Map 3)

6	Sonoita Creek	Arizona
7	Guadalupe Canyon	New Mexico
8	Animas Canyon	New Mexico
9	San Simon Cieniga	New Mexico
10	Camelback Mountain	Arizona
11	Granite Dells	Arizona
12	Fossil Creek	Arizona
13	Zuni Salt Lake	New Mexico

Geological Areas (Potential Additions)  (Symbol and numbers refer to Map 3)

14	Grand Falls, Little Colo. River	Arizona
15	Doney Craters to Black Monocline	Arizona
16	S P Crater	Arizona
17	Government Cave	Arizona
18	Red Mountain	Arizona
19	Lower Gorge, Little Colo. River	Arizona

Research Natural Areas

This program provides for the administrative establishment of Research Natural Areas on Federally-owned lands primarily for research and educational purposes. The identification and inventory of these areas is the responsibility of the Committee on Research Natural Areas. This committee, which represents a number of Federal agencies, was first organized in February 1966 in response to United States participation in the International Biological Program. Legislation is needed that would guarantee their integrity for present and future generations.

The present Research Natural Areas include examples of:

1. Typical or unusual faunistic and/or floristic types, associations or other biotic phenomena.
2. Characteristic or outstanding geologic features and processes.

Research Natural Areas



(Symbol and numbers refer to Map 3)

Name	Acres	Administering Agency
UTAH		
1 Blackbrush	400	Bureau of Land Management
2 Kolob Mesas	75	National Park Service
3 West Rim Phantom Valley	15,360	National Park Service
4 Desert San Dunes	1,200	Bureau of Land Management
5 Desert	1,000	Bureau of Land Management
NEVADA		
6 Wood Canyon	2,880	Bureau of Land Management
7 Pine Creek Canyon	240	Bureau of Land Management
ARIZONA		
8 Black Rock Mountain	154	Bureau of Land Management
10 Mt. Emma	1,154	National Park Service
11 Great Thumb	960	National Park Service
12 Swamp Point	1,120	National Park Service
13 Powell Plateau	5,120	National Park Service
14 Neal Springs	15	National Park Service
15 Wayside	480	National Park Service
16 San Francisco Peaks	1,024	Forest Service
17 G. A. Pearsons	154	Forest Service
18 Walnut Canyon	260	National Park Service
19 Oak Creek Canyon	940	Forest Service
20 Joshua Tree	160	Bureau of Land Management
21 Palm Canyon	840	Bureau of Land Management
22 Fishtail Canyon	160	Bureau of Land Management
23 Antelope Flat	57	Bureau of Sport Fisheries and Wildlife
24 Sierra Pinta	5,120	Bureau of Sport Fisheries and Wildlife
25 Butterfly Peak	1,000	Forest Service
26 Phelps Botanical Area	100	Forest Service
27 Far West Picket Park	90	National Park Service
28 East Picket Park	50	National Park Service
29 South Shake Springs	25	National Park Service
30 Pole Bridge Canyon	320	Forest Service
31 Jesse James	45	National Park Service
32 West Picket Park	40	National Park Service

Special Management Areas with Exceptional Values

In the national forests and on the Public Domain, there is yet another class of area with exceptional or unique natural values. These areas differ from research natural areas in that they are not set aside primarily for scientific, ecological or educational purposes. Usually they are open to multiple use including recreation, mining, grazing or timber production. Because of their unique quality, however, they have been designated for special management in order that their character would not be unnecessarily disturbed. Some of the most notable areas are listed. Multiple use plans provide for careful management of these areas in recognition of their unique character which will insure their future economic productiveness as well as their recreation enjoyment by the public.

Special Management Areas  (Symbol and numbers refer to Map 3)

Names	Acres	Administering Agency
UTAH		
1 Ripple Arch	762	Bureau of Land Management
2 Cottonwood Canyon	80	Bureau of Land Management
3 Joshua Tree	1,000	Bureau of Land Management
4 Sand Mountain	1,600	Bureau of Land Management
5 Red Mountain	6,320	Bureau of Land Management
6 Coral Pink Sand Dunes	1,200	State of Utah
ARIZONA		
7 Sullivan and Virgin River	50,000	Bureau of Land Management
8 Grand Wash Cliffs	35,000	Bureau of Land Management
9 Kanab Creek Canyon	70,000	Bureau of Land Management
10 C. Hart Merriam Scenic Area	275	Forest Service
11 Lower Colorado River	350,000	Bureau of Land Management
12 Kofa Game Range	660,000	Bureau of Sport Fisheries and Wildlife
13 Gila River Greenbelt	62,735	Bureau of Land Management
14 Phelps Botanical Area	100	Forest Service
15 Mexican Duck Habitat	1,000	Bureau of Land Management
16 Vermillion Cliffs	50,136	Bureau of Land Management

Scenic and Recreation Trails

The Lower Colorado Region's large size and diverse recreational opportunities invite touring by car. In addition, western Americans, more than most, are accustomed to using cars and traveling long distances to find variety in both the countryside and in their recreation experiences. It is surprising, therefore, that walking for pleasure, hiking, horseback riding and cycling have become increasingly

popular. Perhaps these more traditional and basic forms of recreation have gained appeal in reaction to the hectic pace of urban life. Perhaps too, we have become more sensitive or aware of the diversity of cultural and natural features that can only really be seen at slower speeds than one normally travels in a car. It is a tribute to Americans that they walk and cycle as much as they do, for very little has been done in the past to encourage these activities. Partly in response to the growing need and partly in hopes of preserving irreplaceable historic and scenic values, Congress enacted the National Trails System Act.

As authorized by Public Law 90-543, the Federal program provides for a National Trails System consisting of two basic kinds of trails. The first of these, National Recreation Trails, are located in or reasonably accessible to urban areas. The other type, National Scenic Trails, are primarily provided for the conservation and enjoyment of nationally significant scenic, historic, natural or cultural qualities. National Recreation Trails may be established, without Congressional approval, by the Secretary of Agriculture on lands administered by him and by the Secretary of the Interior on lands under his jurisdiction as well as on State and local lands with consent. National Scenic Trails can only be authorized and designated by Congress. Trails in the Region recommended for possible inclusion in the system by the National Trails System Act on October 2, 1968 are the Mormon Battalion Trail and the Continental Divide Trail.

The system of National Recreation Trails located in and around metropolitan areas is probably the most urgently needed. Because of the nature of recreation demand, riding and hiking trails emanating in concentric patterns from metropolitan centers should have priority over trail systems in other areas. Although there is potential for a number of Recreation Trails in the Region, only the Sun Circle Trail is now under consideration for designation under the Act. An inventory of other potential trails is needed if the program is ever to reach its full promise.

The Sun Circle hiking and riding trail system (Map 4) consists of a 110-mile loop of interconnecting trails around Phoenix. Radiating from the main trail, like spokes from the hub of a wheel, are proposed primary and secondary trails, which touch many of the city and county parks complementing the trails within these parks. Its genesis serves to illustrate how similar systems can be developed. This system of trails was first conceived by the Arizona State Horsemen's Association Trails Committee. At the request of the Association, the Maricopa County Board of Supervisors appointed the Maricopa County Hiking and Riding Trails Committee, composed of representatives from various interested agencies, organizations and departments. Maricopa County Parks and Recreation Department was then empowered to acquire rights-of-way and leases for the trail. The Committee prepared a report,

published in 1965 by the Maricopa County Planning and Zoning Department, entitled Hiking and Riding Trails in Maricopa County, Arizona. In addition to recommending the 110-mile Sun Circle Trail, the report proposed 580 miles of secondary trails linking valley urban areas and the County Regional Park System.

In June 1964, the Board of Supervisors of Maricopa County adopted these proposals as their comprehensive plan for a system of hiking and riding trails. In November 1964, Maricopa County, Bureau of Reclamation and the Salt River Valley Water Users' Association entered into an agreement that permits the use of certain Salt River Project rights-of-way for public recreation purposes. The Arizona Highway Department provided a horse, cyclist and pedestrian crossing over the freeway at Dunlap Avenue and at Guadalupe Road and the city, county and State are planning drainage underpasses to allow hikers and riders passageway under busy thoroughfares. The Bureau of Land Management and the Forest Service have established trails in the Superstition Mountains and other interest points. In its report, the Maricopa County Hiking and Riding Trails Committee expressed the hope that eventually a statewide system of hiking and riding trails might be established after the pattern of inter-agency cooperation demonstrated with the Sun Circle Trail project.

Among the shortcomings of the National Recreation Trails System, of which the Sun Circle Trail is a proposed part, is the lack of inducement for local entities to participate. There are, for instance, no acquisition, development or maintenance funds associated with designation under the Act. Land and Water Conservation Fund grants might be available on an independent basis, but only if trail projects assume priority compared with other statewide recreation needs which is unlikely in view of the overwhelming needs for other facilities and programs. Another problem common to most trail proposals is the lack of eminent domain, essential for acquiring rights-of-way across private land to link segments of the trail on public lands. If extended to include private lands and some form of public subsidy for acquisition and development, the National Recreation Trails program could greatly enhance metropolitan recreation environments.

Trails are really linear extensions of open space allowing the hiker to regard the countryside as one vast pleasure park. There are no boundaries--no divisions between public and private land or park and farm land. The hiker would be less concerned with seeking out designated public parks if he could enjoy footpaths cutting across attractive walking country. There is a great deal that can be done. Many lands are publicly-owned including water district and military lands which offer opportunities for development close to cities. Bicycle paths can be designed as part of new subdivisions such as those in Litchfield Park. The many old stock driveways afford a unique resource potential for horseback riding trails. These designated

HIKING AND RIDING TRAILS

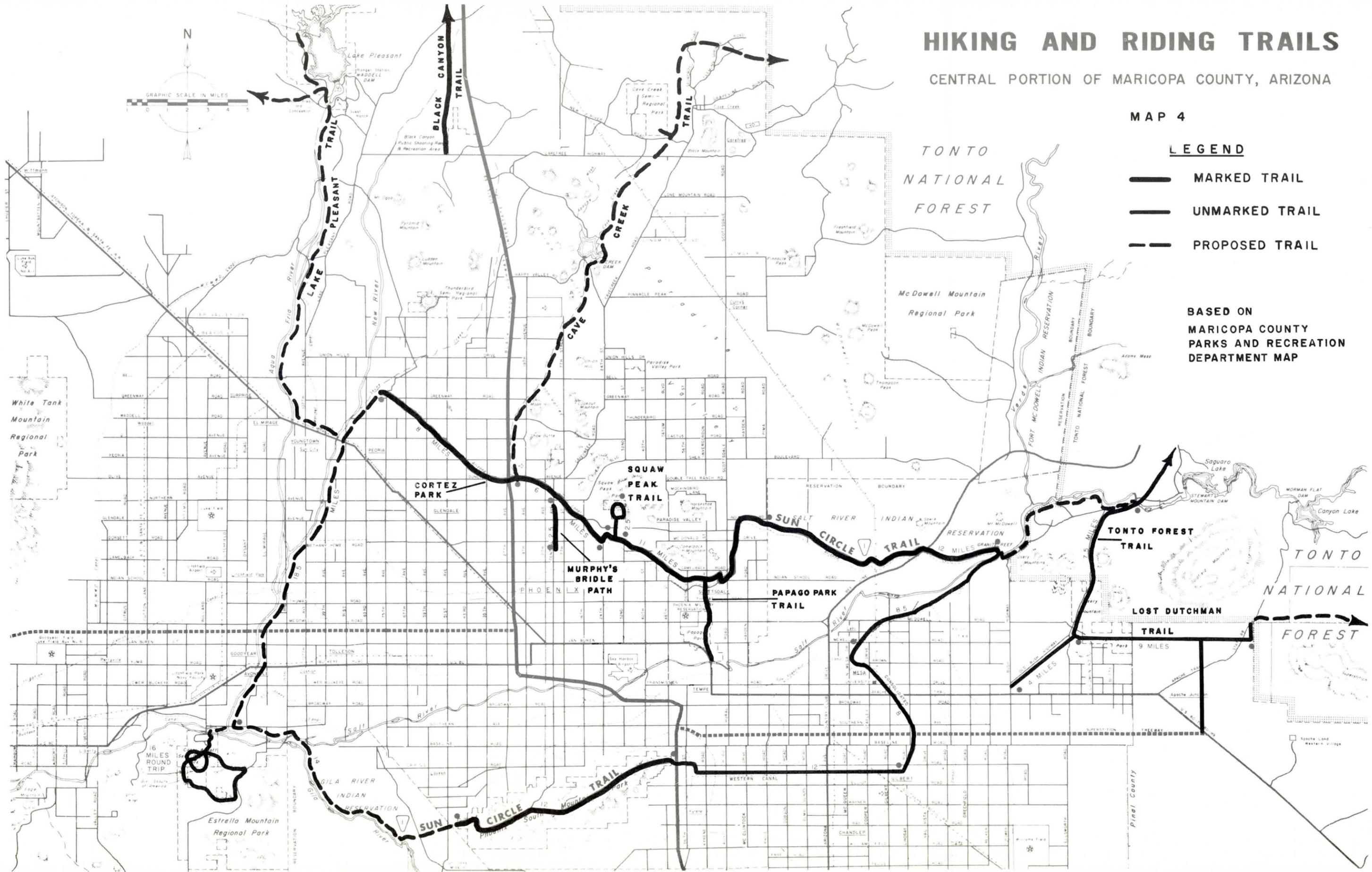
CENTRAL PORTION OF MARICOPA COUNTY, ARIZONA

MAP 4

LEGEND

-  MARKED TRAIL
-  UNMARKED TRAIL
-  PROPOSED TRAIL

BASED ON
MARICOPA COUNTY
PARKS AND RECREATION
DEPARTMENT MAP



driveways extend as much as 100 miles across Federal lands. Negotiations are underway by the Arizona State Horsemen's Association and the State Trails Committee, appointed by the Governor, to open and permanently reserve portions of many of the old livestock driveways for use by horsemen and hikers. Some of the many historic trails throughout the State offer excellent potential for inclusion within the National Scenic Trails System. Among these are the Butterfield-Immigrant Trail, the Coronado Trail, the Gila-Colorado River Trail and the Santa Cruz River Trail. All possibilities should be intensively studied by the State and developed where appropriate.

Scenic Highways

The scenic quality of some of the Region's highways are widely known and appreciated. Such colorful photographic magazines as Arizona Highways have done much to popularize these qualities and to attract thousands of tourists and visitors annually. In 1965, these tourists are estimated to have spent \$400 million in Arizona alone. The Region's States are certainly aware of the value of their scenic countryside and have taken steps to protect it. By any measure, however, more controls are needed if the Region's distinctive scenic qualities and highways are to be preserved.

Driving for pleasure and sight-seeing are the most popular recreation activities in the Region. Combined with the fact that the Region adjoins California and its highly mobile population, it is hardly surprising that Arizona's interest in scenic highways is somewhat ahead of national concern. In 1963, for instance, the Arizona State Highway Commission established the Arizona Parkways System. The Federal Highway Beautification Act (Public Law 89-285), on the other hand, was not passed until 1965 and the Department of Commerce did not identify highways eligible for grants until 1966.

As envisioned by the Arizona Highway Commission, parkways are more than scenic highways, in that they are really elongated linear parks. Geared to leisurely driving, these roads afford travelers both recreational and inspirational experiences. They provide opportunities to observe nature, to sense the history of areas and to enjoy many kinds of recreational activities available along the way. The areas of exceptional natural beauty through which such roads pass, should tempt travelers to stop at vista points and roadside rests. There should be ample opportunities for safe parking off the road where travelers can learn about interesting features of the landscape or relax and enjoy picnics. A system of loop trails should invite travelers to explore the adjoining countryside, which should be preserved as permanent open space either by purchase or easement. Main trunk trails, one for bicycles and one for horses, might parallel the road. Parkway should fit easily and naturally into the folds of the land. Long straightaways, drastic cuts and fills should be avoided.

Access points from abutting properties should be kept to a minimum and commercial traffic should be discouraged by design, if not by regulation. Prohibited and excluded developments along parkways include advertising signs, commercial and industrial buildings, facilities or areas, utility lines except at crossovers and any other construction or clearing not compatible to the parkway concept.

So far, the Highway Commission has designated two stretches of highway as parkways. The Joshua Tree Forest Parkway follows U.S. Highway 93 between Wikieup and Wickenburg. The Pinal Pioneer Parkway follows U.S. Highway 80/89 between Florence and Oracle Junction south of Phoenix. The Highway Department has plans for two additional parkways: the Coronado Trail along U.S. Highway 666 between Clifton and Alpine and along Interstate Highway 15 following the Virgin River.

The success of the parkway or any scenic highway system depends on how effectively the scenic quality of lands adjoining the highway are protected. Because the power of land use regulation rests largely with local government, the program is very much dependent on local action. Since Arizona has no open space program allowing tax relief or other incentives to private landowners, there are few means available other than persuasion to limit development of lands adjoining highways.

In an attempt to strengthen controls over lands bordering scenic highways, the Advisory Commission on Arizona Environment together with the Arizona Highway Department sponsored three new bills all of which were introduced early in the 1970 State legislative session. The most important of these, H.B. 195, would establish a scenic easement board with authority to acquire land or development rights for a scenic easement along interstate, primary, secondary and State highway systems. The right of eminent domain was also made a part of the original bill. The other two laws, H.B. 196 and H.B. 249, dealt with controlling advertising signs and junkyards along highways.

Besides the parkway program, Arizona also has an extensive system of roadside rests along primary and secondary roads. According to the Plan for Outdoor Recreation in Arizona, there are numbered over 600 in 1967. Usually, they consist of pull outs with litter cans, toilets and sometimes picnic facilities. Their justification rests not only on the amenity of view, esthetics and recreation but on safety as well, for these areas serve as useful rest stops to weary travelers. Along the interstate highway system, only one rest stop, of some 37 now planned, has actually been built. Ultimately, the Department of Highways would like to provide a rest stop every 30 or 40 miles along Arizona's highways. Roadside rests also provide an opportunity for advertising kiosks as an alternative to highway billboards. These kiosks would inform the traveler of local services (i.e., hotels, motels, restaurants and garages).

On the Federal level, the value of protecting scenic qualities along highways as well as the possible damage resulting from careless highway location have been recognized in the Department of Transportation Act (Public Law 90-495). Under this law, it is now national policy that special effort be made in planning and locating future highways to preserve the natural beauty of the countryside, public park and recreation lands, wildlife and waterfowl refuges and historic sites. Furthermore, the Secretary of Transportation may not approve any project requiring the use of any public recreation area unless there is no feasible alternative. A precedent-setting case decided under this Act was the controversy surrounding the location of Interstate Highway 280, the Junipero Serra Freeway south of San Francisco in California. The California Division of Highways proposed to extend this highway through the scenic watershed lands around the Crystal Springs Reservoirs owned by the City of San Francisco in San Mateo County.

The State Highway Commission's adopted route along the reservoirs was approved by the Bureau of Public Roads in 1958. In 1965, the city began opposing the reservoir route as detrimental to the scenic, recreational, wildlife and water qualities of the lands and reservoirs and proposed an alternative "ridge route". The city and others brought the matter to the attention of the Department of the Interior in 1967, and the Secretary indicated his support of the "ridge route" to the Secretary of Transportation. The Secretary of Housing and Urban Development took the same position. In May 1968, Federal approval of the reservoir route was withdrawn and the State was requested to study alternative routes. On July 11, the Federal Highway Administrator informed the State, county and city officials that he would wait 60 days for an agreed highway plan after which, if no agreement was reached, he would advise on which route would be funded by the Federal government.

In September 1968, the Administrator met with the officials and announced that the Federal government would furnish 92 percent of the costs of the "ridge route" alignment, contingent upon certain actions by both the City of San Francisco and the State. One requirement directed to the city was that it execute an agreement or other suitable document which would serve to legally and absolutely protect the watershed lands for continued open space and recreational uses. The State Highway Department is to design the freeway to produce the best design for service, safety and public use, blending with the environment and to protect esthetics.

On January 15, 1969, the Secretary of the Interior accepted grants of scenic and recreation easements covering 23,000 acres of watershed land. The easements provide that the area will be preserved in its natural state and that a portion will be used to provide

high-density recreation use. In March, the California Highway Commission formally agreed to the compromise route for Interstate 280 and ratified the easements.

The basic problem relating to any program enhancing highway travel is the lack of an alert and interested citizenry. When developments threaten to destroy or disturb the amenities of the Region's countryside, public interest must be sufficiently aroused to stop it. Usually, however, there is a good deal of inertia to overcome before the public can or will respond. In recognition of this, the following recommendations are made to provide legislative guarantees that the public's interest will be served.

1. Legislation should be enacted to establish and permanently protect scenic easements adjoining designated parkways and other stretches of scenic highways.
2. Legislation should be enacted that would prohibit all off premise outdoor advertising, meant to be viewed from the highway, from all State highways eligible for designation as official State parkways.
3. Legislation should be enacted requiring utility companies regulated by the Public Utilities Commission to coordinate with local planning commissions in the planning stage on the location of all utility placements that would be within view of parkways and scenic highways.

Rare and Endangered Species

The Secretary of the Interior is responsible by statute for identifying, protecting, and propagating native species of fish and wildlife, including migratory birds that are threatened with extinction. Public Law 89-669 defines a species in danger of extinction when its habitat is threatened with destruction, drastic modification or severe curtailment, or because of other factors, and its survival requires man's assistance. The Land and Water Conservation Fund provides financing for land acquisition supporting this program. Endangered species are those so few in number or so threatened by present circumstances as to be in danger of extinction. Rare species are those whose numbers are few throughout their range but may continue to survive if present conditions remain stable. Peripheral species are forms which may be found in satisfactory numbers outside the Region and their occurrence in the Region is at the edge of their natural range.

The species placed in these categories by fish and wildlife specialists are listed below:

Endangered Species

Mammals

Sonoran Pronghorn

Birds

Mexican Duck
American Peregrine Falcon
Masked Bob White
Yuma Clapper Rail
Southern Bald Eagle

Fishes

Gila Trout (New Mexico Species)
Arizona (Apache) Trout
Humpback Chub
Moapa Dace
Colorado River Squawfish
Gila Topminnow

Rare Species

Mammals

Spotted Bat
Kaibab Squirrel

Fishes

Little Colorado Spinedace
Virgin River Spinedace
Wound Fin

Amphibians

Vegas Valley Leopard Frog

Peripheral Species

Mammals

Coatimundi

Birds

Northern Black-bellied Tree Duck	Northeastern Rose-throated Becord
Zone-tailed Hawk	Northwestern Tropical Kingbird
Sennett's White-tailed Hawk	Northern Thick-billed Kingbird
Northern Gray Hawk	Northern Buff-breasted Flycatcher
Northern Black Hawk	Azure Eastern Bluebird
Ferruginous Hawk	Olive Warbler
Blue-throated Hummingbird	Dickey's Varied Bunting
Western Blue-throated Hummingbird	Arizona Grasshopper Sparrow
Northern Violet-crowned Hummingbird	Northern Rufous-winged Sparrow
Coppery-tailed Elegant Trogon	Western Botteris Sparrow
Northern Mexican Chickadee	Northwestern Least Grebe

Fishes

Mexican Stoneroller
Yaqui Chub
Yaqui Sucker
Yaqui Shiner

In addition to the above list, the Arizona Game and Fish Department list the following fish species as endangered: Loach Minnow; Spikedace; Desert Pupfish. Listed as rare is the Bonytail Chub. The Fish and Wildlife Appendix contains additional information on Rare and Endangered Species.

Cultural Values

National recognition of archeological and historical values was expressed as early as 1906 with the passage of the Preservation of Antiquities Act. This Act allowed for the protection of historic landmarks, historic and prehistoric structures and other objects of historic or scientific interest as well as the criminal prosecution of anyone appropriating, excavating, injuring or destroying antiquities located on public lands.

The Historic Sites Preservation Act of August 1935 permitted a program of cooperative agreements with Federal, State and local institutions for recovery of archeological data about to be lost through flooding behind dams. More than 20 years later, the Act of June 27, 1960, specifically provided for the preservation of historical and archeological data (including relics and specimens) which might otherwise be lost through dam construction.

Unfortunately, there has never been any provision for the recovery of archeological and historical data being lost as a result of Federal programs other than dam construction. These losses far surpass those resulting from the building of dams. Bills have been introduced into the United States Senate would extend coverage of the 1960 Act to all Federal and Federally-assisted or licensed programs. In addition, these bills would provide for the transfer of funds to the Secretary of the Interior, for scientific, prehistorical, historical or archeological surveys, investigations and salvage. In view of the accelerating development of the Southwest, such legislation is vitally needed.

Archeology

Four major cultural subareas may be distinguished in the Southwest: the Hohokam of the desert of central and southern Arizona; the Mogollon in the mountainous areas of eastern Arizona and western New Mexico; the Anasazi of the high plateau region known as the Four Corners; and the Patayan, which centers in the Colorado River Valley in a desert environment. There was considerable interchange of cultural characteristics among the major subareas of the Lower Colorado River Basin in prehistoric times. The prehistoric cultures of the Southwest are ancestral to historic and modern Indian cultures of the area. For example, the Hopi of northern Arizona and the Zuni of west-central New Mexico still live on or near the town sites of their prehistoric ancestors.

Another apparent continuity between prehistoric and historic people is seen in the Patayan subarea where the Havasupai, Yavapai and Walapai continue to live in their ancestral homeland along the Colorado River. And in the desert region of southern Arizona the relationships of the present-day Pima and Papago farmers to the prehistoric Hohokam is well established. Present evidence no more than suggests what happened to the prehistoric Mogollon people; some may have joined the Anasazi to the north, others may have joined the Hohokam.

The Southwestern cultural tradition had its roots in the food collecting pattern of western North America. This tradition began to the north around 7000 B.C. and became established about 5000 B.C. in the Southwest. About the beginning of the Christian era, a Southwestern culture clearly distinguishable from those of adjacent regions developed from this food collecting tradition. Cultivation of food plants and pottery making was introduced from Mexico, community populations gradually increased and a more sedentary pattern of living evolved.

The Hohokam flourished in the desert of south-central Arizona. Low, hot, and rarely rained upon, this country was entirely dependent upon streams such as the Salt and Gila Rivers which arose in the mountains to the east. Irrigation farming was the subsistence base of the Hohokam culture and sometime between A.D. 500-900 these prehistoric people engineered a complex irrigation system along these major streams. The earliest period in the history of the Hohokam dates from around 300 B.C. to A.D. 500. It is known from only one site, Snaketown, on the Gila River Indian Reservation near Chandler, Arizona. Other sites representative of Hohokam culture are: A.D. 500-900--the Grewe Sites, just east of Casa Grande Ruins National Monument, and Roosevelt 9:6, at Roosevelt Lake, Arizona; and after A.D. 1100--Casa Grande Ruins National Monument and the upper levels of Ventana Cave.

Like the Hohokam, the Mogollon culture developed from a food collecting base. But, overall, the Mogollon line of development seems less specialized than that of the Anasazi to the north and the Hohokam to the southwest. Despite their earlier beginnings in farming and ceramics, the Mogollon seems to have lost its leadership in Southwestern cultural development relatively early. Later in its history, the Mogollon culture was influenced by both the Anasazi and the Hohokam. Mogollon subsistence was more evenly divided among hunting, gathering and agricultural pursuits than were other Southwestern cultures as indicated in investigations in the Tularosa Cave, Cordova Cave and Mogollon Village Sites in the Tularosa Mountains of southwestern New Mexico.

Although Anasazi cultural tradition is centered in the high plateau country of the Four Corners area, some development occurred in

the Little Colorado River Valley of northern Arizona in prehistoric times. Modern Pueblo Indians and their ancestors have inhabited this general region since about the time of Christ, relying mainly upon natural runoff from springs and the heads of streams to water their crops. The Anasazi have far surpassed the other Indians of the Southwest in architecture, as represented at Navajo National Monument in northern Arizona and at closely related sites such as Mesa Verde National Park and Chaco Canyon National Monument outside the Colorado River Basin.

The Patayan people lived in the valley of the Colorado River below the Grand Canyon. Their culture seems to be characterized by a great poverty of material remains, possibly because of a greater use of perishable materials which have not been preserved. In historic times these people farmed on the alluvial flood plains of the Lower Colorado River but hunted and foraged in the surrounding desert mountains during the flood times. Possibly ancestral to the Patayan people, and preceding them by several thousand years, were the prehistoric Indians who occupied Gypsum Cave near Lake Mead National Recreation Area and the Tule Lake Site nearby, both in Nevada.

Archeological Sites
of Major Significance



(Symbol and numbers refer to Map 3)

- | | | | |
|---|--------------|---|-----------------------|
| 1 | Tule Springs | 6 | Roosevelt |
| 2 | Gypsum Cave | 7 | Tularosa Cave |
| 3 | Snaketown | 8 | Cordova Cave |
| 4 | Grewe Site | 9 | Mogollon Village Site |
| 5 | Casa Grande | | |

History

In the Lower Colorado Region, historic landmarks are generally connected with three major influences in the Region's history: the Indian supremacy, the Spanish settlement and the American period. The first European to visit the basin was Fray Marcos de Niza, a Franciscan who, in 1539, traveled from Mexico in search of the rumored fabulously wealthy cities known as the Seven Cities of Cibola. It was not until the 19th Century that American hunters and trappers began drifting into the Region.

Indian, Mexican and American influences still flavor the life style in the Region. The traditions and western way of life have been retained. For many of the recent migrants, moving to the Region is a practical expression of their desire for a broader perspective and for a simpler, less formal way of life.

Significant Historic
Sites



(Symbol and numbers refer to Map 3)

1	Pipe Springs N. Mon.	16	Park of the 4 Waters
2	Old Oraibi	17	Gatlin Site
3	Awatovi	18	Yuma Territorial Prison
4	Zuni	19	Yuma Crossing
5	Merriam (C. Hart) Base Camp	20	Sierra Bonita Ranch
6	Winona Site	21	Tucson
7	Lowell Observatory	22	San Xavier del Bac
8	Jerome	23	Presidio at Tubac
9	Camp Verde	24	Tumacacori N. Mon.
10	Casa Malpais	25	Fort Buchannon
11	Fort Apache	26	Tombstone
12	Kinishba Ruins	27	Lehner-Mammoth-Kill Site
13	Point of Pines	28	Double Adobe
14	Roosevelt Dam	29	San Bernardino Ranch
15	Pueblo Grande Ruin	30	Fort Bowie N. Mon.

ADDENDUM

ADDENDUM

CONTENTS

	<u>Page</u>
Definitions	XII-A-1
Recreation Land Classification System	A-4
Programs of Public Agencies and Private Interests	A-8
Bibliography	A-23
Study Procedures	A-27
Statistical Tables	
Base Plan	A-36
OBE-ERS Plan	A-55

ADDENDUM

DEFINITIONS

Activity Day. A statistical unit of recreation use by one person in pursuit of a single activity for all or a part of one 24-hour period (see Recreation Day).

Existing Supply. The total acreage of recreation areas that were operational in 1965. Data were derived from the Bureau of Outdoor Recreation's Nationwide Plan inventory and the National Association of Soil and Water Conservation Districts' inventory of private enterprises supplemented by information from management agencies.

National Recreation Area. Areas which have natural endowments that are well above the ordinary in quality and recreation appeal, of lesser significance than the unique scenic and historic elements of the National Park System, but affording a quality of recreation experience which transcends that normally associated with areas provided by state and local governments.

National Significance. National significance is ascribed to areas or sites which possess exceptional value or quality in illustrating or interpreting the natural or cultural heritage of the Nation.

Non-Resident Tourist. All those traveling on one-day or overnight trips within a State of which they are not residents.

Operation, Maintenance and Replacement Costs. The value of goods and services needed to operate a constructed project and make repairs and replacements necessary to maintain the project in sound operating condition during its economic life.

Outdoor Recreation. Leisure time activities which utilize outdoor recreation resources and facilities.

Outdoor Recreation Carrying Capacity. An expression of the optimum per acre annual visitation at recreation areas. Levels of development, physical conditions (soil, climate, vegetation, slope, etc.) and the quality and type of recreation experience are factors that were considered in evolving capacity estimates.

Outdoor Recreation Unit. A facility or group of complementary facilities normally in a camp, picnic site or park, designed to accommodate a family or other small group.

Participation Day. Synonymous with Activity Day.

Participation Rate. The number of occasions of participation in various outdoor recreation activities by an individual during a measured time period as set forth in Outdoor Recreation Resources Review Commission Study Report No. 19, usually 1 year.

Recreation Day. A statistical unit of recreation use consisting of a visit by one person for all or a portion of one 24-hour period. One recreation day may consist of one or several activity days by the same person (see Activity Day).

Recreation Demand. The quantity of participation in outdoor recreation activities that will occur based on surveys indicating trends in increased participation rates through time. Demand as used in this study does not include latent demand that might be expressed if additional opportunities were available.

Recreation Facilities. Structures or other improvements specifically constructed for use in outdoor recreation activities in a designated area.

Recreation Needs. The difference between demand and supply expressed in units of recreation days or land acreage requirements.

Resident Tourist. All those residents of a State traveling on one-day or overnight trips within that State.

Standard Metropolitan Statistical Area (SMSA). A county or group of contiguous counties which contain at least one city of 50,000 or more inhabitants or "twin cities" with a combined population of at least 50,000. For more detail refer to U.S. Bureau of the Census publications.

Statewide Significance. Statewide significance is ascribed to areas or sites which possess outstanding value or quality in illustrating or interpreting the natural or cultural heritage of the state. A recreation area of statewide significance is one that will receive use from all state residents but without the endowments necessary for national recognition.

Travel Time Zones. Potential demand for recreation is directly related to available time. Time coupled with means of mobility governs the distances recreation seekers are willing and able to travel. In this study, three travel zones were established for each metropolitan area:

1. Zero to 2 hour zone.
2. Two to four hour zone.
3. Over four hour zone.

Urban Population. The total number of people living in urban places and urbanized areas as defined in the 1960 census of population.

Visitor Day. Twelve visitor hours of recreation use. (It may be composed of twelve persons visiting for one hour each, etc. A visitor hour is composed of one person visiting for 60 minutes, five persons for 12 minutes each, etc. One overnight 24-hour visit would consist of two visitor days.) (See Activity Day and Recreation Day.)

Water-based Recreation. Those activities which require water for participation such as boating, swimming, sailing and canoeing. Boating was the key activity used to determine needs for this study because it requires the most space and can be undertaken only on relatively large bodies of water. Fishing needs are treated at length in the Fish and Wildlife Appendix.

RECREATION LAND CLASSIFICATION SYSTEM

Class I Lands - High-Density Recreation Areas

Physical Requirements. Physiographic features such as topography, soil type, drainage, etc., should be adaptable to special types of intensive recreation use and development. An attractive natural setting is desirable; however, man-made settings are acceptable. There are no specific size criteria, and there is great variation in size from one area to another.

Location. Usually within or near major centers of urban population but may occur within such units as national parks and forests remote from population concentrations.

Activities. Intensive day or weekend type such as picnicking, water sports, winter sports, group field games and other activities for many people.

Developments. High degree of facility development which often requires heavy investment. They are usually managed exclusively for recreation purposes. Development may include a road network, parking areas, bathing beaches and marinas, bathhouses, artificial lakes, playfields and sanitary and eating facilities.

Responsibility. Commonly held under municipal, county or regional ownership. Many commercial resorts have similar characteristics and collectively provide a significant portion of recreation opportunities for urban population centers.

Class II Lands - General Outdoor Recreation Areas

Physical Requirements. May have varied topography, interesting flora and fauna within a generally attractive natural or man-made setting adaptable to providing a wide range of opportunities. These areas range in size from several acres to large tracts of land.

Location. Usually more remote than Class I areas, however, relatively accessible to centers of urban population and accommodate a major share of all outdoor recreation. Included are portions of public parks and forests, public and commercial camping sites, picnic grounds, trail parks, ski areas, resorts, streams, lakes and coastal areas.

Activities. Extensive day, weekend and vacation use types such as camping, picnicking, fishing, hunting, water sports, winter sports, nature walks and outdoor games.

Developments. Generally less intensive than Class I areas. Includes, but not limited to, access roads, parking areas, picnic areas, campgrounds, bathing beaches, marinas, streams, natural and/or artificial lakes. Areas are equipped with some man-made facilities which may vary from simple to elaborate. Thus, campgrounds may have only the barest necessities for sanitation and fire control; or they may have ample and carefully planned facilities such as cabins, hot and cold running water, laundry equipment, stores, museums, small libraries, entertainment, juvenile and adult playfields. Other features may include permanent tows for ski areas, fully equipped marinas, lodges, dude ranches and luxury hotels.

Responsibility. Federal, State or local governments, including regional park and recreation authorities and private clubs and other forms of private ownership assisted by public agencies on problems of access and development of basic facilities.

Class III Lands - Natural Environment Areas

Physical Requirements. Varied and interesting land forms, lakes, streams, flora and fauna within attractive natural settings.

Location. Usually more inaccessible from population centers than Classes I and II areas and occur throughout the country and, on an acreage basis, are the largest class in both public and private ownership.

Activities. Extensive weekend and vacation types dependent on quality of the natural environment such as sight-seeing, hiking, nature study, picnicking, camping, swimming, boating, canoeing, fishing, hunting and mountaineering. The primary objective is to provide for traditional recreation experience in the out-of-doors commonly in conjunction with other resource uses. Users are encouraged to enjoy the resource "as is", in natural environment.

Developments. Access roads, trails and, where considered necessary, minimum sanitary facilities. There may be other compatible uses of the areas such as watershed protection, water supply, grazing, lumbering and mining provided such activities are managed so as to retain the attractiveness of the natural setting.

Responsibility. Federal, State or local governments including regional park and recreation authorities and private ownership.

Class IV Lands - Outstanding Natural Areas

Physical Requirements. Outstanding natural feature associated with an outdoor environment that merit special attention and care in management to insure their preservation in their natural condition.

Includes individual areas of remarkable natural wonder, high scenic splendor or features of scientific importance. One or more such areas may be part of a larger administrative unit such as a national park or forest.

Location. Any place where such features are found.

Activities. Sight-seeing, enjoyment and study of the natural features. Kinds and intensity of use limited to the enjoyment and study of the natural attractions so as to preserve the quality of the natural features and maintain an appropriate setting. May be visited on a day, weekend or vacation trip.

Developments. Limited to minimum development required for public enjoyment, health, safety and protection of the features. Wherever possible, access roads and facilities other than trails and sanitary facilities should be kept outside the immediate vicinity of the natural features. Visitors encouraged to walk to the feature or into the area when feasible. Improvements should harmonize with and not detract from the natural setting.

Responsibility. Public agencies (Federal, State and local) and private landowners with assistance from public agencies who may identify, set aside and manage natural features. Generally the Federal government assumes responsibility for the protection and management of natural areas of national significance; the States for areas of regional or State significance; and local government and private owners for areas of primarily local significance.

Class V Lands - Primitive Areas

Physical Requirements. Extensive natural, wild and undeveloped area and setting removed from the sights, sounds and smells of civilization. Essential characteristics are that the natural environment has not been disturbed by commercial utilization and that the areas are without mechanized transportation. The area must be large enough and so located as to give the user the feeling that he is enjoying a "wilderness experience". The site may vary with different physical and biological conditions and may be determined in part by the characteristics of adjacent land. Size may vary in different parts of the country. These areas are inspirational, esthetic, scientific and cultural assets of the highest value.

Location. Usually remote from population centers.

Activities. Camping out on one's own without mechanized transportation or permanent shelter or other conveniences.

Developments. No development of public roads, permanent habitations or recreation facilities except trails. No mechanized equipment allowed except that needed to control fire, insects and disease. Commercial use of the area that may exist at the time of establishment should be discontinued as soon as practical.

Responsibility. Usually Federal but may also be by State agencies or private landowners (such as the high mountain country held by large timber and mining companies).

Class VI Lands - Historic and Cultural Sites

Physical Requirements. These are sites associated with the history, tradition or cultural heritage of national, State or local interest and are of enough significance to merit preservation or restoration.

Location. The location of the feature establishes the site.

Activities. Sight-seeing, enjoyment and study of the historic or cultural features. Kinds and intensity of use limited to this type of study and enjoyment.

Developments. Management should be limited to activities that would effect such preservation and restoration as may be necessary to protect the features from deterioration and to interpret their significance to the public. Access to the area should be adequate but on-site development limited to prevent overuse. Development should not detract from the historic or cultural values of the site.

Responsibility. Public agencies (Federal, State and local) and private landowners who identify, set aside and manage historic and cultural areas.

PROGRAMS OF PUBLIC AGENCIES AND PRIVATE INTERESTS

Federal Recreation Programs

The Federal government assists the States and other interests in their efforts to provide outdoor recreation through numerous Federal agencies. Currently, there are some 53 Bureaus and about 35 independent offices, agencies, boards, commissions, committees and councils involved with outdoor recreation. All but six of these are, in some measure, concerned with recreation in the Lower Colorado Region.

Within the Region, Federal agencies administer about 47 million acres of land or about 52 percent of all lands. Each agency has different policy objectives and management responsibilities. The National Park Service, Forest Service, Bureau of Land Management, Bureau of Reclamation, Corps of Engineers, Bureau of Sport Fisheries and Wildlife, Department of Defense and Bureau of Indian Affairs have planning, administrative and management responsibilities for public land and water resources. In addition, there are other agencies with planning and advisory roles as their primary function including the Bureau of Outdoor Recreation, Department of Housing and Urban Development and the Soil Conservation Service.

Department of the Interior

National Park Service

The National Park Service is primarily responsible for promoting and regulating the recreational use of National Parks and Monuments. This use must be regulated in such a way as to conserve the scenery, natural and historic objects and the wildlife, in order that these values will be left unimpaired for the enjoyment of future generations.

There are three categories of areas in the National Park System today--natural, historical and recreational. In natural areas, the management is directed toward maintaining and, where necessary, re-establishing the natural ecological balance. Appropriate public use and enjoyment is provided for, to the extent that it can be accommodated without impairing natural values. In historical areas, resource management is directed toward maintaining and, where necessary, restoring the historical integrity of structures, sites and objects significant to the commemoration or illustration of the historical values. Recreational areas are established primarily to conserve and develop for public enjoyment, recreation resources of national significance, including those of scenic, natural or historic interest and their wildlife.

The National Park Service also administers the Registered National Landmark and the Historic Properties Preservation programs, which are dedicated to the preservation of both public and private historic sites.

Bureau of Land Management

The basic recreation objective of the Bureau of Land Management is to provide the greatest possible public use and enjoyment of the public lands consistent with multiple use and sustained yield management of the several natural resources for which the lands are managed, as well as preservation and protection of natural and cultural values and maintenance of a quality environment.

Specific long-term objectives are:

1. Provide for an adequate variety and supply of quality outdoor recreation uses on the public lands commensurate with public needs, resource potentials and consistent with a quality environment.
2. Preserve and protect significant natural, historic and cultural resources and provide for their public use and development where consistent with preservation goals.

Specific goals for achieving these objectives are:

1. Complete and maintain an inventory of existing and potential outdoor recreation opportunities and an evaluation and analysis of these opportunities in terms of priorities for public use and enjoyment.
2. Establish and maintain a data bank on visitor use, characteristics and demands.
3. Identify, evaluate and provide appropriate public access to land and water-based recreation areas.
4. Identify, support and participate in national and regional recreation programs of significance.
5. Establish and maintain control of recreation use through public education, regulation, land classification and enforcement.
6. Develop the technical capabilities and expertise to plan and manage recreation opportunities.
7. Clean up the public lands and maintain quality and environmental standards.

8. Increase the capacity to provide adequate recreation facilities and respond to increasing demands for outdoor recreation opportunities.
9. Plan for and develop water-based recreation opportunities where appropriate.
10. Preserve, protect and develop, where appropriate, archeological, primitive, historical, cultural and natural values.
11. Achieve a balanced development and maintenance program and provide a sound basis for making capital investment in outdoor recreation.

Bureau of Sport Fisheries and Wildlife

The Bureau of Sport Fisheries and Wildlife administers various programs and facilities within the Lower Colorado Region. These include management and enforcement of migratory bird laws and regulations, cooperative predatory animal control and wildlife service programs, migratory bird refuges, a national system of fish hatcheries, research laboratories, a river basin study program and research programs involving fish and wildlife of recreational and economic importance.

Under the provisions of the Fish and Wildlife Coordination Act, the Bureau cooperates with the State fish and game agencies in the analysis of water project development proposals by any department or agency of the United States, or by any public or private agency under Federal permit or license.

Recommendations are made for the mitigation of project-caused fish and wildlife losses, for enhancement of these resources and for the provisions of public hunting and fishing on project areas.

The Bureau also administers the Federal Aid in Fish and Wildlife Restoration programs (Dingell-Johnson and Pittman-Robertson) and the National Anadromous Fishery Program Act. Under these programs, Federal monies are allocated to the State fish and game agencies for fish and wildlife research, restoration and management and for acquisition, development and administration of lands and waters for fish and wildlife.

The Bureau of Sport Fisheries and Wildlife administers seven National Wildlife Refuges and three National Fish Hatcheries in the Lower Colorado Region. Public hunting and fishing are allowed on portions of the refuges. Wide use is also made of all the refuges and hatcheries by general recreationists. Recreational activities within these installations, however, are coordinated with wildlife management

objectives and may be restricted as to time of year, or in some cases, to certain areas where recreation activities will not interfere with conservation objectives.

Bureau of Reclamation

The Bureau plans, constructs, and operates projects which develop water resources for multiple-use. One of these uses is recreation. The reservoirs or lakes, canals and live streams created by these projects provide water-related recreational opportunities. With the advent of Senate Document 97 and the Federal Water Project Recreation Act, (P.L. 89-72) the Bureau became more directly involved in the development of recreation and fish and wildlife enhancement facilities on its projects.

In the past a minimum acreage of land has been acquired in Federal ownership for access and control beyond the area covered by impounded water. Current requests for project authorizations include recommendations for additional land acquisition for recreation and fish and wildlife preservation. Upon completion of a project, actual management of the recreational facilities is assumed by some agency other than Reclamation, and in many cases a non-Federal agency. Usually, this agency operates the facilities at its own expense and shares in the cost of the recreational development, particularly, if the facilities have been provided under the authority of the Federal Water Projects Recreation Act.

Bureau of Outdoor Recreation

The Bureau of Outdoor Recreation has a short history dating from May 1962. The agency was formed as a result of recommendations by the Outdoor Recreation Resources Review Commission. The Bureau is responsible for providing coordination of Federal plans and programs relating to outdoor recreation on public lands. Its objective is to assure the effective and efficient use of all available outdoor recreation resources. As part of its program, the Bureau is also responsible for the preparation of a Nationwide Outdoor Recreation Plan. All Federal agencies are directed by Public Law 88-29 to conduct their programs in general conformance with this plan. In addition, the Bureau administers the Land and Water Conservation Fund which provides grants for Federal, State and local recreation projects.

Bureau of Indian Affairs

The Bureau of Indian Affairs is responsible for a wide range of activities designed to conserve and utilize the natural resources on the 16 million acres of Indian lands in the Lower Colorado Region. Among its programs, the Bureau offers limited financial and technical assistance to the Indians in developing the recreation resources of

their lands. Most of the lands are not public, however, and are developed as though they were privately-owned.

Some Indians, such as the Apache Tribe at Fort Apache have realized the economic value of their recreation resources and are undertaking various improvements. The Bureau of Indian Affairs has encouraged these undertakings and is succeeding in interesting other tribes in similar programs, as well as in assuming either full or partial responsibility for operation and maintenance of the completed projects.

Department of Agriculture

Forest Service

The Forest Service manages the national forests under the provisions of the Multiple Use-Sustained Yield Act of 1960. That Act directed that the national forests be managed for outdoor recreation, range timber, watershed and wildlife and fish purposes.

Thus, outdoor recreation is a very important use of the national forests. Campgrounds, picnic sites and other facilities for intensive recreation are provided as funds are available, following a planned development program based upon current needs and projected trends. Emphasis is also placed upon wilderness management, the consideration of esthetics in all phases of land use and the protection of areas of outstanding historic, scenic, geologic, ecological or other special qualities.

With the passage of the Wilderness Act of September 3, 1964, Congress identified 854,969 acres of wilderness on the national forests to be managed in such a manner that they will remain unimpaired for future use and enjoyment as wilderness, and declared wilderness as one of the multiple use resource of national forests. In addition 587,631 acres of national forest land has been designated as primitive areas to be managed as wilderness until their suitability for wilderness classification has been determined.

Suitable areas on the national forests are developed under special use permit for recreation resorts, organization sites and other types of recreation endeavors. Lakes, reservoirs and streams on the national forests are developed to provide for boating, fishing and other water-related recreation opportunities.

Soil Conservation Service

In its recreation program, the Soil Conservation Service deals with both the public and private sectors. Twelve major categories of outdoor recreation on private lands are recognized by the Service.

These are: (1) vacation cabins, cottages and homesites; (2) camping grounds; (3) picnic and field sports area; (4) fishing waters; (5) golf courses; (6) hunting areas; (7) natural, scenic and historic areas; (8) riding stables; (9) shooting ranges; (10) vacation farms and ranches; (11) water sports areas; and (12) winter sports areas. Although assistance is primarily related to the soil, water and plant aspects of recreational land use, the Service also provides technical recreation help to landowners and operators involved in developing private outdoor recreation businesses.

Under provision of Public Law 83-566, the Watershed Protection and Flood Prevention (Small Watershed) Act and in those R.C.&D. projects authorized by the Secretary of Agriculture, the Department of Agriculture, through the Soil Conservation Service, shares with State and local agencies up to one-half the cost of construction, land rights and basic facilities needed for access and enjoyment of recreation areas. The Department may also advance funds to local organizations for immediate purchase of lands, easements and rights-of-way to prevent encroachment by other developments on small watershed projects.

Farmers Home Administration

The Farmers Home Administration makes or insures loans to rural community groups to finance recreational facilities and to family farmers to establish income-producing recreation enterprises.

Under Authorization provided in 7 U.S.C. 1926: Consolidated Farmers Home Administration Act of 1961, as amended, section 306, recreation association loans are available to eligible rural nonprofit community associations to finance such facilities as swimming pools, tennis courts, lakes and ponds for boating and fishing, picnic grounds, shooting preserves, camping grounds and similar recreation facilities.

Under authorization provided in 7 U.S.C. 1923, section 306, Consolidated Farmers Home Administration Act of 1961, as amended, recreation facility loans are available to assist eligible farm and ranch owners or tenants to convert all or a portion of the farms they own or operate to outdoor income-producing recreational enterprises which will supplement or supplant farm or ranch income.

Under authorization provided in 7 U.S.C. 1010, 1011 (Supp V) 1959-63, Food and Agriculture Act of 1962; Public Law 87-703, resource conservation and development loans may be made to provide assistance, to provide recreation facilities, among other things, to local sponsoring agencies in authorized areas where acceleration of programs of resource conservation, development and utilization will increase economic opportunities for local people.

Department of Defense

The primary responsibility of the Department of Defense is to coordinate the planning and programming of the various branches of the military services. Departmental policy is primarily concerned with military aspects. Large areas suitable for recreational use are made available, however, if their use is compatible with military programs.

In compliance with Public Law 89-797, the Departments of Defense and Interior have developed a cooperative plan to carry out a program of development, maintenance and coordination of fish and game conservation and rehabilitation on military reservations. The plans allow for the issuance of hunting and fishing permits to the public where possible. Suitable areas are determined in cooperation with the Bureau of Sport Fisheries and Wildlife and the State departments of fish and game. Other types of recreational use of military land are limited by a lack of Federal funds. Fees may be charged for recreational use and the fees collected used for development of the resource involved.

Army Corps of Engineers

The Corps of Engineers is responsible for the planning and construction of multiple purpose water control, local flood protection, navigation and beach erosion control projects. For many years the Corps has been authorized to construct and operate recreation areas and facilities at these water projects. On most existing reservoir projects, the Corps has provided basic public use facilities including access roads, parking areas, campgrounds and picnic areas, boat launching ramps, water supply and sanitary facilities. In some cases, the recreation facilities are operated under nominal leases by other agencies. The Federal Water Project Recreation Act also applies to the Corps of Engineers' reservoir projects as with the other Federal agencies. Thus, for reservoir projects authorized subsequent to 1965, unless a State or local government agency assumes management of the recreation and fish and wildlife enhancement facilities, and agrees to bear at least one-half of the separable cost for operation, maintenance and replacements, the Corps can only provide minimum basic facilities for public health and safety. This cost sharing under P.L. 89-72 is applicable for all Corps reservoir projects unless the reservoir and its recreation facilities are included or proposed for inclusion within a national recreation area, or are appropriate for administration by a Federal agency as a part of a National Forest system, as part of lands classified for retention in Federal ownership, or in conjunction with an authorized Federal program for the conservation and development of fish and wildlife. For non-reservoir flood control projects, the Corps has established policies requiring non-Federal participation quite similar to that necessary under P.L. 89-72.

Federal Power Commission

The Federal Power Commission requires "Exhibit R" to be filed with an application for license of a non-Federal hydroelectric project. This exhibit is to contain a proposed plan for the full public utilization of project waters and adjacent lands for recreational purposes, so far as is consistent with proper operation of the project for the development of water power and other public purposes.

State Recreation Program

The Lower Colorado Region embraces nearly all of Arizona and parts of New Mexico, Utah and Nevada. Because so much of the land within the Region is arid and of limited potential, a high percentage still remains in Federal ownership. As a result, most of the population tends to concentrate in a few urban centers such as Las Vegas, Phoenix and Tucson. Consequently, it has been the policy within the States to emphasize and satisfy the recreational needs of these population centers. The following policy statement from the Plan for Outdoor Recreation in Arizona (p. 6-26) illustrates this emphasis:

Recreation projects providing facilities in close proximity to population centers shall have priority over projects providing the same type of facilities far removed from population centers.

Like many other areas, however, the recreational resources are not always found in the counties or cities where most of the people live. These populous counties usually have more funds available for developing recreation facilities than adjoining less populous areas. These funds, however, are rarely used to develop potential resources in areas outside of the populous county or city jurisdictions. Thus, one of the primary objectives of State government is to meet the needs of the population centers by providing facilities in areas which are otherwise unable to underwrite such projects. The states have also assumed the responsibility for supplying public areas and facilities for holiday, weekend and vacation use beyond the day use zone of urban centers.

State Organizations

With so much of the land in public ownership or Indian trust (99.6 percent in Nevada and 81 percent in Arizona), cooperation between all levels of government is essential. Each State has, therefore, established a coordinating branch of government. These coordinating branches are responsible for preparing a statewide comprehensive plan for development of the recreational resources of the State. In addition, they administer the disbursement of funds

allocated through the Bureau of Outdoor Recreation under Public Law 88-578, the Land and Water Conservation Fund Act of 1965.

As in most States, the responsibility for implementing the recreation program belongs to three agencies: the State parks authority, the State fish and game agency and the highway department. Table 10 indicates the general functions of these agencies in each State in the Region. Generally, it is the role of the State parks authority to supply non-urban overnight and day use park facilities.

The highway departments are involved with providing a system of roadside rests and view areas along highways. They also administer funds granted under Public Law 89-285 (Highway Beautification Act) for esthetic or recreation projects along State highways. The State fish and wildlife programs provide for the maintenance and improvement of the fish and wildlife resource. This is usually supported through the sale of hunting and fishing licenses. Additional responsibilities involve the administration of grants under the Federal Aid to Wildlife (Pittman-Robertson) and the Federal Aid to Fisheries (Dingell-Johnson) Acts.

TABLE 10

OUTLINE OF STATE ORGANIZATIONS
AND RECREATION FUNCTIONS

<u>Organization</u>	<u>Function</u>
<p><u>Arizona</u></p> <p>Arizona Outdoor Recreation Coordinating Commission</p>	<p>Coordinates recreation plans and developments of Federal, state, county, city, town, and private agencies. Receives and allocates funds from Land and Water Conservation Act and State Lake Improvement Fund to carry out recreation programs. Establishes criteria for administration of the State comprehensive plan for outdoor recreation resources.</p>
<p>Arizona State Parks Board</p>	<p>Authorized to select, acquire, preserve, establish and maintain areas of natural features, scenic beauty, historical and scientific interest. Responsible for historic preservation within the State as authorized under the National Historic Preservation Act of 1966.</p>
<p>Arizona Highway Commission</p>	<p>Constructs and maintains and operates roadside rest areas and scenic overlooks. Constructs and maintains historical monuments and markers as well as administration of highway beautification program.</p>
<p>Arizona Game and Fish Commission</p>	<p>Responsible for care and propagation of all game, fish and birds. Operates State game farms and fish hatcheries. Enforces game and fish laws and issues hunting and fishing licenses. Coordinates Federal Aid programs under Pittman-Robertson and Dingell-Johnson Acts.</p>

TABLE 10 (cont'd)

<u>Organization</u>	<u>Function</u>
<u>New Mexico</u>	
State Park and Recreation Commission	Acquires, develops, maintains and administers suitable land and water recreation areas.
Department of Game and Fish	Maintains game and fish through research, surveys, acquisition and development of land and water for wildlife, waterfowl, and fish purposes. Coordinates Federal Aid programs under Pittman-Robertson and Dingell-Johnson Acts.
State Highway Department	Constructs, maintains and operates roadside rest areas and scenic overlooks. Administers highway beautification program.
<u>Utah</u>	
Utah State Recreation Planning Subcommittee	Directs preparation and maintenance of State recreation plan. Reviews grants-in-aid under Land and Water Conservation Fund and Highway Beautification Act.
State Park and Recreation Commission	Develops, operates and maintains parks. Formulates and implements comprehensive plan for acquisition, planning, protection, operation, maintenance, development and wise use of State parks and property for grazing, fish and game, mining, development and utilization of water and other natural resources.

TABLE 10 (cont'd)

<u>Organization</u>	<u>Function</u>
<u>Utah (cont'd)</u>	
Utah State Department of Fish and Game	Protect, propagate, manage and distribute game animals, furbearing animals, game birds and game fish throughout the State. Coordinates Federal Aid programs under Pittman-Robertson and Dingell-Johnson Acts.
Utah Department of Highways	Implements highway beautification programs and together with county road departments provides access to all resources.
<u>Nevada</u>	
Division of State Parks	Acquires, develops, operates, maintains and interprets a well-balanced system of areas of outstanding scenic, recreational, scientific and historic importance. Prepares and maintains a comprehensive statewide outdoor recreation plan and is responsible for on-going State Park planning projects. Establishes qualifications and standards for an historic marker program, establishes and maintains a State Historic Marker registry system and develops and maintains a system of historic site markers.
Nevada Department of Fish and Game	Manages fish and game resources, enforces hunting and fishing laws. Acquires access rights to fishing waters in cooperation with Federal, State and local levels of government. Coordinates Federal Aid programs under Pittman-Robertson and Dingell-Johnson Acts.

TABLE 10 (cont'd)

<u>Organization</u>	<u>Function</u>
Nevada (cont'd) State Park Advisory Commission	Reports to the Governor or Legis- lature relative to the park and recreation policy of the State and advises the Administrator of the Division of State Parks concerning formulation of the policy of the Division.
State Highway Department	Constructs, maintains and operates roadside rest areas and administers beautification programs.

City and County Recreation Programs

Undoubtedly, cities and counties face the most difficult tasks in satisfying recreational needs. Demand generated within highly populated areas often places a heavy burden on local agencies to provide facilities. Land, the basic resource, is frequently lost to the subdivider and speculator. If vacant and open land is available, it is frequently too expensive to acquire for recreation purposes. Many parks must be created at great cost by removing existing improvements. Some counties and towns adjoining densely populated areas have inadequate funds to develop recreation resources. Yet, it is these areas where land costs are reasonable and where most of the vacant land is located.

With the sheer variety of facilities needed and offered, there is a heavy responsibility placed on the cities and counties. Not only must playgrounds and city parks be provided, but non-urban regional parks also. Special attention must be devoted to the needs of young people, the aged and infirm, and persons with low incomes. Active recreational guidance programs requiring large staffs of specialized personnel must also be maintained.

In spite of these problems, the local authorities are meeting the recreational needs within the larger metropolitan areas. In fact, sufficient acreage in Phoenix and Tucson has been dedicated for recreation to satisfy regional needs for several decades to come. Unfortunately, much of the land is isolated in large blocks and is not distributed evenly throughout the area. These large parks are not, therefore, readily available to the public for use when time is a limiting factor (e.g., after work or school).

Ultimately, the local agencies must coordinate and plan their efforts with State and Federal agencies. New Federal legislation, such as the Land and Water Conservation Fund Act, which provides financial assistance for recreational projects, requires comprehensive plans as a prerequisite to any grants. The Urban Beautification and the Open Space Land Acts are both Federal programs providing assistance to communities. In addition, special regional assessment districts based on user areas rather than county or city boundaries, are requiring coordinated efforts on the local level.

The Private Role

The scope of outdoor recreation is far too broad for governmental organizations alone to satisfy. Non-government groups, both commercial and non-profit, have always played an essential role in providing recreation facilities and services in the Lower Colorado Region. Some Federal agencies, such as the Bureau of Reclamation, which is otherwise not authorized to administer extensive recreation developments, does

allow leases and concessions to private interests in its developments. The Army Corps of Engineers similarly leases lands and allows concessions on some of its projects, as does the National Park Service within national parks and recreation areas.

But even more significant than the private role within public recreational areas is the role played in meeting recreational demands in privately-owned areas. The federal grant should cooperate with private investors seeking to establish new commercial recreation enterprises consistent with the development plans for the area, by assisting in the search for suitable sites, negotiating to assure provision of utilities and services, securing road connections, providing buffer zones and similar constructive measures.

More than 11 million acres of private agricultural and other lands in the Region are available for recreation. Private landowners invite their friends and relatives to use these lands. The public has access to some of these areas when permission is obtained. Out-of-door activities of all kinds are utilized though they may be informal with limited facilities. The use of these resources reduces some of the pressure from public recreation areas.

One essential factor in private enterprise is the profit motive when monies and abilities are invested. The private sector is most successful in those types of recreation enterprises that require a greater degree of service than provided by public programs. Such types include development and operation of marinas, concessions, shooting preserves, golf courses, dude ranches, amusement parks, guide services and many others. The private businessman is in a position to establish these types of recreation activities of a quality and quantity beyond that which is possible by the public sector. Such developments and activities are often found in or near major public recreation areas.

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STUDY PROCEDURES

The following set of procedures were developed to utilize available information in the calculation and estimation of recreation supply, demand and needs for the Lower Colorado Region.

Supply of Outdoor Recreation Areas

The supply of outdoor recreation areas was determined for both the present and future target years of the study. These data were assembled on both land and water areas for each Subregion.

Existing Areas

The primary source of data on existing public recreation areas was the inventory conducted by the Bureau of Outdoor Recreation in 1964 for the Nationwide Outdoor Recreation Plan. Information on private recreation facilities and areas was obtained from a survey made by the National Association of Soil and Water Conservation Districts. This inventory, however, was limited to communities and areas of 5,000 population or less. Indian Trust lands, considered as private in this study, had not been reliably classed and, therefore, were not inventoried into the six ORRRC land use Classes. Water also was not classed.

Acreage Capacity

Supply data were converted to recreation days for comparability with recreation demand. Acreage capacity for 1965 was based on the optimum use of each of the land classes, except historic sites, at 1965 levels of development. Comparison between the 1965 supply in recreation days and the target year demand yielded deficiencies or surpluses. Each Federal agency and the States provided estimates of the 1965 capacity of their lands by class. These differed for each agency because of various levels and standards of development. Department of Defense lands were not considered in the supply, since their use is subject to military requirements and controls. Capacity estimates for locally administered lands were based on the model carrying capacities explained in the section describing the method for identifying resource requirements.

The capacity of water surface areas available and suitable for recreation was estimated for each Subregion. Factors considered in making these estimates, among others, included the proximity to major population centers, size of water body, length of season, and type of experience available.

Recreation Demand

The objective of this study was to estimate recreation demand, for selected recreation activities, upon the Lower Colorado's land and water resources for the base year 1965; and to project this demand expressed in "recreation days", to the target years 1980, 2000 and 2020. This demand was derived through the use of participation rates, (the average yearly rate at which people in a specific geographic area take part in outdoor recreation) calculated for each of the activities considered.

Assumptions

Participation Rates

For this study demand was assumed to be equivalent to participation; therefore, approximate participation rates had to be determined for the outdoor recreation activities under consideration. A procedure for deriving demand estimates is expounded at length in Study Report 19 of the Outdoor Recreation Resources Review Commission. Basically, it involved correlations between participation in a selected group of activities and the socio-economic characteristics of the population. The data was compiled as the National Recreation Survey and was gathered by interviews during the 1960 Census of the United States. The data from the National Recreation Survey have been adjusted to suit certain socio-economic factors characteristic of Arizona. These adjusted participation rates were developed by the Arizona Outdoor Recreation Coordinating Commission for use in the State of Arizona's Plan for Outdoor Recreation. In estimating the demand in the Lower Colorado Region, the Arizona participation rates were assumed to be appropriate for use in Nevada, Utah and New Mexico. It should be pointed out that these projections were developed for Arizona as a whole and do not consider the various differences in socio-economic factors existing between the different Subregions and the other States involved.

Recreation Activities

Only the following 20 activities were considered in this study: picnicking; attending outdoor sports events; nature walks; attending outdoor concerts, dramas, etc.; playing outdoor games and sports; bicycling; horseback riding; swimming; sailing and canoeing; other boating; water-skiing; sledding and tobogganing; ice skating; snow skiing; fishing; hunting; camping; hiking; mountain climbing; and miscellaneous. Of the above activities, only five (swimming; sailing and canoeing; other boating; water-skiing and fishing) are considered to be water-based. Certain activities such as walking and driving for

pleasure and sight-seeing have not been included in this list because the resource requirements and recreation development requirements to satisfy these activities could not be adequately measured (see discussion under "Demand - A Function of Population" on page 28).

Population Characteristics

The participation rates developed by the Outdoor Recreation Review Commission were for persons 12 years of age or older. It seemed reasonable, however, to assume that these rates would also apply to the entire population, including those under 12 years of age. For many activities outdoor recreation is, to a large extent, family oriented (picnicking, camping, etc.). In addition, for certain activities (bicycling, playing outdoor games and sports, sledding, etc.) the participation rates are probably even higher for persons under 12 years of age, thus resulting in an underestimate. Therefore, the entire population was used in computing recreation demand.

Demand was divided into three population classifications: Lower Colorado Resident SMSA (Standard Metropolitan Statistical Area); Resident Non-SMSA; and Non-Resident (Tourist). Recreation demand by activity for each of the three population components was calculated for each of the three Subregions.

Recreation Day

A recreation day is defined as a "statistical unit of recreation use consisting of a visit by one person for all or a portion of one 24-hour period. One recreation day may consist of one or several activity days by the same person." An "activity day" is defined as a "statistical unit of recreation use by one person in pursuit of a single activity for all or a part of one 24-hour period". Since recreation demand is to be expressed in recreation days, it was necessary to derive a method for converting activity (or participation days) to recreation days. A California Department of Parks and Recreation Study entitled "A Summary Report on Recreation Surveys, 1966" determined, after comparing activity and recreation days for certain activities at select sites, that one activity day was equivalent to .833 recreation days. Because comparable information did not appear to be available for the Lower Colorado Region, the California conversion factor was used in this study.

Estimating Base Year (1965) Demand

Resident SMSA Demand

In order to express needs and requirements for outdoor recreation resources by Subregion, the demand generated and satisfied within those Subregions must be estimated. Significantly, over 70 percent of the

Region's population is concentrated in the Phoenix, Tucson and Las Vegas metropolitan areas. According to the Arizona Plan for Outdoor Recreation, an average of 75 percent of the demand of the residents of Phoenix and Tucson was satisfied within 100 miles of these centers, 17 percent within 200 miles and 8 percent beyond 200 miles. It was further estimated that the zero to 2 -hour travel time zone (a maximum round trip travel time zone of 4 hours) was equivalent to the 100-mile day use zone. In this zone, almost all of the 1-day recreation trips are made. The 2 to 4 -hour travel time zone (4 to 8 hours round trip) was considered equivalent to the 200-mile weekend use zone that accommodated about 17 percent of the total demand. It is within the first 4 hours from home that almost all, some 92 percent of the total demand, is met and all day and weekend use takes place. Any recreation trip over 4 hours (8 hours minimum round trip) was considered synonymous with the over 200-mile extended trip or vacation zone.

Assuming that the same relationships apply to Las Vegas, it was possible to allocate percentages of demand satisfied within travel time zones for each of the Standard Metropolitan Statistical Areas in the Region. A further distribution of the demand by Subregion was made on the basis of the percentage of the land area in the travel time zone that is included within a particular Subregion. For purposes of this estimate of demand, 5 percent of the total demand generated in this Region was considered to be satisfied outside of the Region. Thus, although 8 percent of the demand was satisfied in the over 4-hour travel time zone, 5 percent of the total was manifest outside of the Region. The remaining 3 percent was the factor used in calculating the demand within the over 4-hour travel time zone.

To summarize, the SMSA demand allocated to each Subregion was computed by multiplying each activity participation rate by the sum of the following:

1. Percent of 0 to 100 -mile travel zone in the Subregion X 1965 SMSA population X 75 percent (percent of demand satisfied in 0 to 2 -hour travel time zone); +
2. Percent of 100 to 200 -mile travel zone in the Subregion X 1965 SMSA population X 17 percent (percent of demand satisfied in 2 to 4 -hour travel time zone); +
3. Percent of over 200-mile travel zone in the Subregion X 1965 SMSA population X 3 percent (percent of demand satisfied in over 4-hour travel time zone and within Region).

Resident Non-SMSA Demand

The resident demand, exclusive of any SMSA demand and that portion of demand satisfied outside of the Region, is assumed to be satisfied entirely within each of the respective Subregions. Thus, each Subregion's population (minus any SMSA population within that Subregion) was first multiplied by 0.95 (5 percent of all demand was assumed to be satisfied outside the Region) and then by each of the activity participation rates.

Non-Resident (Tourist) Demand

In order to determine the total tourist demand, the number of tourists entering the Lower Colorado Region in 1965 was multiplied first by the percent of tourists engaging in outdoor recreation and then by their average length of stay. Figures so obtained were then converted to activity days and allocated to specific activities using the following method: Individual participation rates were added to arrive at a total comprehensive participation rate. The individual rates were then divided by this total rate to determine what percent of the total tourist demand should be allocated to each activity. (For purposes of this analysis, it was assumed that Regional participation rates also applied to tourists.)

The total tourist demand was then allocated to the Subregions.

Projecting Demand to Target Years (1980, 2000, 2020)

After estimating recreation demand for the base year of 1965, the demand was projected to the 3 target years. To accomplish this, it was necessary to make two types of projections--population and participation.

Population

For the non-tourist demand components (Resident SMSA and Resident Non-SMSA) the modified OBE-ERS population projections were used for each Subregion and for each SMSA. The U. S. population growth rate was applied to the 1965 tourist estimate as it was assumed the number of tourists in the future would parallel the growth in total U. S. population.

Participation

The "socio-economic" factors that affect participation in outdoor recreation, as described in ORRRC Study Report No. 20, were considered separately from opportunity factors (the increased opportunities resulting from development of new recreation resources). The eight socio-economic factors were expected to increase 1965 participation

rates by 30.8 percent, 65.8 percent and 94.4 percent respectively for the 3 target years. All activities should also experience improved opportunity levels that will further increase the participation rates by 10, 20 and 30 percent respectively in the target years.

Summary

For each of the 4 years for which recreation demand was computed (1965, 1980, 2000 and 2020), the total number of activity days for each Subregion was determined by adding the three demand components (Resident SMSA, Resident Non-SMSA and Tourist) as allocated to the individual Subregions. Finally, these activity day totals were converted to recreation days by multiplying by the factor .833 (as explained in the "Assumptions" section).

Recreation Needs

Needs are defined as the difference between recreation supply and demand in terms of recreation days. As described in the section explaining the basis for estimating outdoor recreation demand, supply and demand were respectively converted to recreation days from acreage and activity occasions. Needs were determined for the base year 1965 and for the projection years of 1980, 2000 and 2020.

Resource Requirements

Recreation needs are expressed in recreation days. In order that these needs could be meaningfully used in the recreation plan, they translated into development requirements and acreage acquisition requirements. In evolving both development and acreage requirements, driving and walking for pleasure and sight-seeing were not considered. These activities do not necessarily occur on land dedicated to recreation. Acreage acquisition requirements were limited to Class I and Class II lands, since additional Class III lands would satisfy a relatively small portion of the demand.

The distribution of demand by ORRRC land class was necessary to indicate deficiencies or surpluses in the supply of any one class of land. This was done for all classes except historic and cultural sites (Class VI), which primarily involve activities not considered in this report, e.g., sight-seeing. The procedure for apportioning demand between the five recreation classes entailed estimating the percent of total participation days occurring on each land class. Each activity was analyzed separately and later combined to indicate total participation by class.

The demand and consequent need for Class I opportunities is closely related to short travel time from population centers. It was necessary, therefore, to allocate the total regionwide demand for

Class I lands, which amounted to 47.2 percent of the total resident demand, to the Subregions on the basis of their population. The greatest demand for this type of resource occurred in the Gila Subregion and the least in the sparsely populated Subregions. The Regional demand remaining after the Class I portion was subtracted and divided among the other classes in each Subregion as follows:

Class II	71 percent of the remainder
Class III	23 percent of the remainder
Class IV	3 percent of the remainder
Class V	3 percent of the remainder

In order to compare supply with demand, it was necessary to account for the private role. The supply figures were, therefore, adjusted by adding an estimated number of recreation days that was assumed to be the 1965 capacity of the private recreation resource. The capacity estimates for Classes I and II were increased by amounts equal to 10 percent of Class I and 10 percent of Class II demand, respectively. Since Indian Trust lands are largely open to public recreation use, their capacity was estimated at the model rate of Class III areas (8 recreation days per acre per year) as described below. The remaining Class III private lands were estimated to have a capacity of 5 percent of the 1965 Class III demand. The difference between demand and supply then yielded recreation day deficits for each of the various land classes. If there was a deficit demand for ORRRC Classes IV or V, this figure was transferred to a Class III deficit, since Class III would probably assume the burden of meeting that demand. The provision of new Classes IV and V areas is not feasible. In any case, the need for additional unique natural and primitive areas is actually based on their existence rather than their development or creation.

Future Federal development needs were estimated based on information provided by the various Federal agencies. Satisfying these development needs involves increasing the capacity of existing lands primarily through the provision of more facilities. Non-Federal needs were of two kinds: development and additional acreage acquisitions. Development needs were simply the amount of unsatisfied demand that was not met by the Federal government.

Model carrying capacities were developed for ORRRC Classes I, II and III. In making these estimates, participation in each of the activities considered was distributed to one of the appropriate ORRRC classes. The density of use was then estimated for each activity and a maximum number of recreation days per acre was computed for each class. The resulting capacity figures are indicated below:

Class I -- 3,200 recreation days per acre per year
Class II -- 1,300 recreation days per acre per year
Class III -- 8 recreation days per acre per year

These capacity estimates were then used to convert the target year recreation day deficits into non-Federal acreage acquisition needs. Federal acreage acquisition needs were indicated by the various Federal agencies based on their respective known or anticipated plans.

Water recreation requirements were considered separately from land requirements. The procedure involved separating out the demand for boating on lakes and reservoirs and comparing it with the present boating capacity of the water resource. The capacity estimate differed for each Subregion depending on location with respect to population centers, size and distribution of the water bodies, season of use, type of recreation experience afforded, etc. These estimates ranged between 20 to 100 boats per acre per year. The deficit recreation days were then converted into acres by dividing the capacity figure into the deficit. In using boating as the key activity to identify future water-based recreation requirements, it was assumed that if there were enough water to satisfy boating requirements there would also be enough for the other activities, including swimming and water-skiing.

Cost Estimates

Recreation requirements were expressed in terms of development and acreage acquisition needs. Average cost estimates for meeting these needs are in 1965 dollars and were based on the following procedures:

Class I

Development Costs

The provision of Class I areas has until now largely been a function of local city or county government. In making the cost estimate, therefore, an average of the capital (exclusive of land acquisition), operating, maintenance and replacement expenditures by cities in the Pacific Southwest was computed. The Recreation and Park Yearbook, published by the National Recreation and Park Association, was the source used in preparing this average. The final figure indicated to develop Class I lands was \$2 per recreation day.

Operation, Maintenance and Replacement Costs--

The Recreation and Park Yearbook was also used in estimating the operation, maintenance and replacement costs. This estimate was 50¢ per recreation day per year in 1965.

Acreage Acquisition Costs

The Recreation and Park Yearbook was again used in making acreage acquisition cost estimates. The Yearbook indicated capital expenditures by city including land acquisition costs. From information provided by the Department of Housing and Urban Development regarding the average per acre cost of land in projects funded through the Open Space Land Program, it was possible to approximate the amount cities were spending for land. The figure finally developed from the two above sources modified to suit the Lower Colorado Region was \$4,000 per acre.

Class II

Development Costs

The type of land typically providing Class II recreation opportunities most closely resembles the areas managed by State park and recreation departments. In the Pacific Southwest, California has the largest system of State parks and affords the best measure of what Class II development costs are. Therefore, a review was made of the average annual capital (exclusive of land acquisition), operating, maintenance and replacement expenditures by the California State Park System. The resulting figure of \$4 per recreation day was used in estimating the cost of developing Class II lands.

Operation, Maintenance and Replacement Costs

Based on averages involved in operating the California State Park System, the estimate of these costs is 30¢ per recreation day per year in 1965.

Acreage Acquisition Costs

For the Lower Colorado Region, the acquisition costs of Class II lands were based on data available from the National Park Service and Forest Service. This information was correlated with the California and Great Basin Regions to assure comparability. The final estimate adopted was \$550 per acre.

TABLE A-1
LOWER COLORADO REGION
RECREATION LANDS-1965

ADMINISTRATION	LAND AREA (ACRES)						
	Class I	Class II	Class III	Class IV	Class V	Class VI	Total
<u>Federal</u>							
Forest Service	700	4,570	12,532,340	66,700	1,447,710	3,000	14,055,020
Bureau of Land Management	4,000	105,050	19,332,660	2,012,260	925,060	16,060	22,395,090
National Park Service	12,200	81,220	1,617,050	310,690	896,390	4,910	2,922,460
Bureau of Sport Fisheries and Wildlife	--	160	1,694,360	--	--	--	1,694,520
Total Federal (Available for Recreation)	16,900	191,000	35,176,410	2,389,650	3,269,160	23,970	41,067,090
Federal Lands not Available for Recreation							5,768,410
<u>State</u>	--	3,570	213,290	4,090	9,500	40	230,490
<u>Local</u> ^{1/}	4,390	7,960	50,960	10,340	76,500	910	151,060
Total Public (Available for Recreation)	21,290	202,535	35,440,660	2,404,080	3,355,160	24,920	41,448,640
Public Lands not Available for Recreation							16,035,360
<u>Private</u>							
Indian Trust ^{2/}							15,549,700
Other Private	20,808	17,339	10,665,784	69	0	0	10,704,000
Total Private (Available for Recreation)							26,253,700
Private Lands not Available for Recreation ^{3/}							6,249,300
Total Region (Available for Recreation)							67,702,340
Region Lands not Available for Recreation							22,284,660

^{1/} Includes cities, counties, districts, etc.

^{2/} Not inventoried by Recreation Land Class.

^{3/} A portion of these lands may be available for recreation but have not been inventoried.

TABLE A-2
DEMAND, SUPPLY AND NEEDS
LOWER COLORADO REGION
(MODIFIED OBE-ERS)

TARGET YEAR (CUMULATIVE TOTALS)	SUPPLY RECREATION DAYS (1000)			DEMAND RECREATION DAYS (1000)	UNSATISFIED DEMAND ^{1/} RECREATION DAYS (1000)
	PUBLIC	PRIVATE	TOTAL		
Class I					
1965	24,088	3,741	27,829	37,410	14,083
1980				79,028	51,199
2000				173,282	145,453
2020				305,713	277,884
Class II					
1965	35,055	6,516	41,571	71,550	29,979
1980				133,891	92,320
2000				260,212	218,641
2020				434,426	392,855
Class III ^{2/}					
1965	190,561	125,453	316,014	23,178	--
1980				43,373	--
2000				84,294	--
2020				140,730	--
Class IV ^{2/}					
1965	7,643	--	7,643	3,023	
1980				5,657	
2000				10,995	
2020				18,356	
Class V ^{2/}					
1965	344	--	344	3,023	
1980				5,657	
2000				10,995	
2020				18,356	

XII-A-37

^{1/} Because there was a surplus supply of some land classes in certain Subregions, the figures shown as needs represent cumulative Subregional needs and do not necessarily reflect differences between Regional demand and supply.

^{2/} Unsatisfied Class IV and Class V demand will have to be satisfied by Class III supply.

TABLE A-3
 ADDITIONAL DEVELOPMENT AND
 LAND ACQUISITION
 NEEDS
 LOWER COLORADO REGION
 (MODIFIED OBE-ERS)

TARGET YEAR (CUM. TOTALS)	DEVELOPMENT NEEDS ^{1/} (REC. DAYS 1000)		NON-FEDERAL LAND ACQUISITION NEEDS ^{2/} (ACRES)
	FEDERAL	NON-FEDERAL	
Class I			
1965	--	14,083	4,400
1980	4,996	46,203	14,430
2000	19,846	125,607	39,250
2020	40,900	236,984	74,060
Class II			
1965	--	29,979	23,060
1980	23,211	69,109	53,160
2000	69,889	148,752	114,420
2020	103,913	288,942	222,260

^{1/} Federal development requirements are based on planned future Federal programs and apparent need with regard to resource ownership and distribution. The remaining development was allocated to the non-Federal sector.

^{2/} Satisfying these acquisition needs is a non-Federal responsibility only. The Federal development needs will be satisfied on existing lands through increased capacities as well as a shift of some lands from Class III multiple use to other single-purpose recreation classes. Estimates of this (cumulative) acreage shift for 1980, 2000 and 2020 are as follows: 1,313,809; 1,631,709; 1,874,284.

TABLE A-4
 COST OF SATISFYING NEEDS
 (CUMULATIVE TOTALS)
 LOWER COLORADO REGION
 (MODIFIED OBE-ERS)

TARGET YEAR	SECTOR OF ECONOMY	CLASS I			CLASS II		
		DEVELOPMENT AND OPERATION COSTS (DOLLARS)		LAND ACQUISITION COST (DOLLARS)	DEVELOPMENT AND OPERATION COSTS (DOLLARS)		LAND ACQUISITION COST (DOLLARS)
		DEVEL.	O.M.&R.(1)		DEVEL.	O.M.&R.(1)	
1980	FEDERAL	9,991,600	2,497,900	--	92,845,600	6,963,400	--
	NON-FEDERAL	92,405,800	23,101,400	57,720,000	276,435,200	20,732,600	29,238,000
2000	FEDERAL	39,691,200	9,922,800	--	279,556,800	20,966,800	--
	NON-FEDERAL	251,214,200	62,803,600	157,000,000	595,006,800	44,625,500	62,931,000
2020	FEDERAL	81,800,000	20,450,000	--	415,652,800	31,174,000	--
	NON-FEDERAL	473,967,800	118,491,900	296,240,000	1,155,768,400	86,682,500	122,243,000

(1) Includes annual operation, maintenance and replacement costs for the target year levels of development.

TABLE A-5
DEVELOPMENT AND
LAND ACQUISITION NEEDS
FOR WATER BASED RECREATION
LOWER COLORADO REGION
(MODIFIED OBE-ERS)

TARGET YEAR (CUM. TOTALS)	DEVELOPMENT NEEDS ^{1/} (REC. DAYS 1000)		NON-FEDERAL LAND ACQUISITION NEEDS ^{2/} (ACRES)
	FEDERAL	NON-FEDERAL	
Class I			
1965	--	2,817	880
1980	999	9,241	2,886
2000	3,969	25,121	7,850
2020	8,180	47,397	14,812
Class II			
1965	--	10,493	8,071
1980	8,124	24,188	18,606
2000	24,461	52,063	40,047
2020	36,370	101,130	77,791

^{1/} Federal development requirements are based on planned future Federal programs and apparent need with regard to resource ownership and distribution. The remaining development was allocated to the non-Federal sector.

^{2/} Satisfying these acquisition needs is a non-Federal responsibility only. The Federal development needs will be satisfied on existing lands through increased capacities as well as a shift of some lands from Class III multiple use to other single-purpose recreation classes.

TABLE A-6
 COST OF SATISFYING WATER
 BASED RECREATION NEEDS
 (CUMULATIVE TOTALS)
 LOWER COLORADO REGION
 (MODIFIED OBE-ERS)

TARGET YEAR	SECTOR OF ECONOMY	CLASS I			CLASS II		
		DEVELOPMENT AND OPERATION COSTS (DOLLARS 1,000)		LAND ACQUISITION COST (DOLLARS 1,000)	DEVELOPMENT AND OPERATION COSTS (DOLLARS 1,000)		LAND ACQUISITION COST (DOLLARS 1,000)
		DEVEL.	O.M.&R.(1)		DEVEL.	O.M.&R.(1)	
1980	FEDERAL	1,998	500	--	32,496	2,437	--
	NON-FEDERAL	18,481	4,620	11,544	96,752	7,256	10,233
2000	FEDERAL	7,938	1,985	--	97,845	7,338	--
	NON-FEDERAL	50,243	12,561	31,400	208,252	15,619	22,026
2020	FEDERAL	16,360	4,090	--	145,478	10,911	--
	NON-FEDERAL	94,794	23,698	59,248	404,519	30,339	42,785

XII-A-41

(1) Includes annual operation, maintenance and replacement costs for the target year levels of development.

TABLE A-7
 ADDITIONAL WATER ACREAGE
 REQUIRED TO SATISFY BOATING NEEDS
 LOWER COLORADO REGION
 (MODIFIED OBE-ERS)

Subregion	Cumulative Acreage Needs			
	1965	1980	2000	2020
Lower Main Stem	--	--	--	--
Gila	--	--	29,300	86,030
Little Colorado	--	6,000	19,680	38,760
Regional Total	--	6,000	48,980	124,790

TABLE A-8
LOWER MAIN STEM SUBREGION
RECREATION LANDS-1965

ADMINISTRATION	LAND AREA (ACRES)						Total
	Class I	Class II	Class III	Class IV	Class V	Class VI	
<u>Federal</u>							
Forest Service	--	650	1,956,000	5,600	--	10	1,962,260
Bureau of Land Management	1,600	96,100	14,285,860	1,302,440	925,060	15,180	16,626,240
National Park Service	12,200	80,640	1,494,920	224,270	858,430	540	2,671,000
Bureau of Sport Fisheries and Wildlife	--	160	1,694,300	--	--	--	1,694,460
Total Federal (Available for Recreation)	13,800	177,550	19,431,080	1,532,310	1,783,490	15,730	22,953,960
Federal Lands not Available for Recreation							4,302,040
<u>State</u>	--	2,340	130,650	3,450	9,500	30	145,970
<u>Local</u> ^{1/}	1,260	4,480	640	--	--	--	6,380
Total Public (Available for Recreation)	15,060	184,370	19,562,370	1,535,760	1,792,990	15,760	23,106,310
Public Lands not Available for Recreation							5,907,720
<u>Private</u>							
Indian Trust ^{2/}							1,824,000
Other Private	1,976	6,068	3,023,956	0	0	0	3,032,000
Total Private (Available for Recreation)							4,856,000
Private Lands not Available for Recreation ^{3/}							1,375,000
Total Subregion (Available for Recreation)							27,962,310
Subregion Lands not Available for Recreation							7,982,690

XII-A-43

^{1/} Includes cities, counties, districts, etc.

^{2/} Not inventoried by Recreation Land Class.

^{3/} A portion of these lands may be available for recreation but have not been inventoried.

TABLE A-9
DEMAND, SUPPLY AND NEEDS
LOWER MAIN STEM SUBREGION
(MODIFIED OBE-ERS)

TARGET YEAR (CUMULATIVE TOTALS)	1965 SUPPLY RECREATION DAYS (1000)			DEMAND RECREATION DAYS (1000)	UNSATISFIED DEMAND RECREATION DAYS (1000)
	PUBLIC	PRIVATE	TOTAL		
Class I					
1965	10,192	632	10,824	6,322	--
1980				21,013	10,189
2000				52,452	41,628
2020				83,337	72,513
Class II					
1965	15,253	2,508	17,761	25,080	7,319
1980				50,707	32,946
2000				100,216	82,455
2020				163,119	145,358
Class III ^{1/}					
1965	99,670	14,998	114,668	8,124	--
1980				16,426	--
2000				32,464	--
2020				52,841	--
Class IV ^{1/}					
1965	4,003	--	4,003	1,060	
1980				2,142	
2000				4,234	
2020				6,892	
Class V ^{1/}					
1965	182	--	182	1,060	
1980				2,143	
2000				4,234	
2020				6,892	

XII-A-44

^{1/} Unsatisfied Class IV and Class V demand will have to be satisfied by Class III supply.

TABLE A-10
 ADDITIONAL DEVELOPMENT AND
 LAND ACQUISITION
 NEEDS
 LOWER MAIN STEM SUBREGION
 (MODIFIED OBE-ERS)

TARGET YEAR (CUM. TOTALS)	DEVELOPMENT NEEDS ^{1/} (REC. DAYS 1000)		NON-FEDERAL LAND ACQUISITION NEEDS ^{2/} (ACRES)
	FEDERAL	NON-FEDERAL	
Class I			
1965	--	--	--
1980	3,656	6,533	2,040
2000	11,604	30,024	9,380
2020	25,440	47,073	14,710
Class II			
1965	--	7,319	5,630
1980	4,975	27,971	21,520
2000	12,561	69,894	53,760
2020	25,455	119,904	92,230

^{1/} Federal development requirements are based on planned future Federal programs and apparent need with regard to resource ownership and distribution. The remaining development was allocated to the non-Federal sector.

^{2/} Satisfying these acquisition needs is a non-Federal responsibility only. The Federal development needs will be satisfied on existing lands through increased capacities as well as a shift of some lands from Class III multiple use to other single-purpose recreation classes. Estimates of this (cumulative) acreage shift for 1980, 2000 and 2020 are as follows: 892,209; 899,109; 911,884.

TABLE A-11
 COST OF SATISFYING NEEDS
 (CUMULATIVE TOTALS)
 LOWER MAIN STEM SUBREGION
 (MODIFIED OBE-ERS)

TARGET YEAR	SECTOR OF ECONOMY	CLASS I			CLASS II		
		DEVELOPMENT AND OPERATION COSTS (DOLLARS)		LAND ACQUISITION COST (DOLLARS)	DEVELOPMENT AND OPERATION COSTS (DOLLARS)		LAND ACQUISITION COST (DOLLARS)
		DEVEL.	O.M.&R.(1)		DEVEL.	O.M.&R.(1)	
1980	FEDERAL	7,312,000	1,838,000	--	19,898,800	1,492,400	--
	NON-FEDERAL	13,066,400	3,266,600	8,160,000	111,885,200	8,391,400	11,836,000
2000	FEDERAL	23,208,000	5,802,000	--	50,245,200	3,768,400	--
	NON-FEDERAL	60,048,200	15,012,000	37,520,000	279,575,600	20,968,200	29,568,000
2020	FEDERAL	50,880,000	12,720,000	--	101,818,400	7,636,400	--
	NON-FEDERAL	94,146,200	23,536,500	58,840,000	479,614,000	35,971,000	50,726,500

(1) Includes annual operation, maintenance and replacement costs for the target year levels of development.

TABLE A-12
GILA SUBREGION
RECREATION LANDS-1965

ADMINISTRATION	LAND AREA (ACRES)						Total
	Class I	Class II	Class III	Class IV	Class V	Class VI	
<u>Federal</u>							
Forest Service	700	3,050	8,565,960	46,200	1,440,310	2,950	10,059,170
Bureau of Land Management	2,400	8,480	4,211,140	709,820	--	800	4,932,640
National Park Service	--	460	65,080	7,490	16,460	2,970	92,460
Bureau of Sport Fisheries and Wildlife	--	--	60	--	--	--	60
Total Federal (Available for Recreation)	<u>3,100</u>	<u>11,990</u>	<u>12,842,240</u>	<u>763,510</u>	<u>1,456,770</u>	<u>6,720</u>	<u>15,084,330</u>
Federal Lands not Available for Recreation							1,118,670
<u>State</u>	--	1,230	59,530	640	--	10	61,410
<u>Local</u> ^{1/}	2,840	3,220	49,920	10,340	76,500	690	143,510
Total Public (Available for Recreation)	<u>5,940</u>	<u>16,440</u>	<u>12,951,690</u>	<u>774,490</u>	<u>1,533,270</u>	<u>7,420</u>	<u>15,289,250</u>
Public Lands not Available for Recreation							7,445,750
<u>Private</u>							
Indian Trust ^{2/}							6,443,410
Other Private	16,020	10,185	5,268,766	29	0	0	5,295,000
Total Private (Available for Recreation)							11,738,410
Private Lands not Available for Recreation ^{3/}							2,316,590
Total Subregion (Available for Recreation)							27,027,660
Subregion Lands not Available for Recreation							9,762,340

XII-A-47

^{1/} Includes cities, counties, districts, etc.

^{2/} Not inventoried by Recreation Land Class.

^{3/} A portion of these lands may be available for recreation but have not been inventoried.

TABLE A-13
DEMAND, SUPPLY AND NEEDS
GIIA SUBREGION
(MODIFIED OBE-ERS)

TARGET YEAR (CUMULATIVE TOTALS)	1965 SUPPLY RECREATION DAYS (1000)			DEMAND RECREATION DAYS (1000)	UNSATISFIED DEMAND RECREATION DAYS (1000)
	PUBLIC	PRIVATE	TOTAL		
Class I					
1965	12,968	2,802	15,770	28,020	12,250
1980				51,842	36,072
2000				110,086	94,316
2020				205,072	189,302
Class II					
1965	17,575	2,850	20,425	34,888	14,463
1980				62,074	41,649
2000				122,773	102,348
2020				211,818	191,393
Class III ^{1/}					
1965	77,929	52,009	129,938	11,302	--
1980				20,109	--
2000				39,771	--
2020				68,617	--
Class IV ^{1/}					
1965	3,499	--	3,499	1,474	
1980				2,623	
2000				5,188	
2020				8,950	
Class V ^{1/}					
1965	161	--	161	1,474	
1980				2,623	
2000				5,188	
2020				8,950	

XII-A-48

^{1/} Unsatisfied Class IV and Class V demand will have to be satisfied by Class III supply.

TABLE A-14
 ADDITIONAL DEVELOPMENT AND
 LAND ACQUISITION
 NEEDS
 GILA SUBREGION
 (MODIFIED OBE-ERS)

TARGET YEAR (CUM. TOTALS)	DEVELOPMENT NEEDS ^{1/} (REC. DAYS 1000)		NON-FEDERAL LAND ACQUISITION NEEDS ^{2/} (ACRES)
	FEDERAL	NON-FEDERAL	
Class I			
1965	--	12,250	3,830
1980	1,340	34,732	10,850
2000	7,202	87,114	27,220
2020	14,160	175,142	54,730
Class II			
1965	--	14,464	11,130
1980	16,728	24,921	19,170
2000	40,786	61,562	47,360
2020	55,708	135,686	104,370

^{1/} Federal development requirements are based on planned future Federal programs and apparent need with regard to resource ownership and distribution. The remaining development was allocated to the non-Federal sector.

^{2/} Satisfying these acquisition needs is a non-Federal responsibility only. The Federal development needs will be satisfied on existing lands through increased capacities as well as a shift of some lands from Class III multiple use to other single-purpose recreation classes. Estimates of this (cumulative) acreage shift for 1980, 2000 and 2020 are as follows: 39,900; 58,400; 67,500.

TABLE A-15
 COST OF SATISFYING NEEDS
 (CUMULATIVE TOTALS)
 GILA SUBREGION
 (MODIFIED OBE-ERS)
CLASS I

TARGET YEAR	SECTOR OF ECONOMY	DEVELOPMENT AND OPERATION COSTS (DOLLARS)		LAND ACQUISITION COST (DOLLARS)	DEVELOPMENT AND OPERATION COSTS (DOLLARS)		LAND ACQUISITION COST (DOLLARS)
		DEVEL.	O.M.&R.(1)		DEVEL.	O.M.&R.(1)	
1980	FEDERAL	2,679,600	669,900	--	66,912,000	5,018,400	--
	NON-FEDERAL	69,464,800	17,366,200	43,400,000	99,685,600	7,476,400	10,543,500
2000	FEDERAL	14,403,200	3,600,800	--	163,144,000	12,235,800	--
	NON-FEDERAL	174,228,600	43,557,200	108,880,000	246,247,200	18,468,500	26,048,000
2020	FEDERAL	28,320,000	7,080,000	--	222,832,000	16,712,400	--
	NON-FEDERAL	350,284,600	87,571,200	218,920,000	542,742,000	40,705,600	57,403,500

(1) Includes annual operation, maintenance and replacement costs for the target year levels of development.

05-A-50 XII-A-11X

TABLE A-16
LITTLE COLORADO SUBREGION
RECREATION LANDS-1965

ADMINISTRATION	LAND AREA (ACRES)						Total
	Class I	Class II	Class III	Class IV	Class V	Class VI	
<u>Federal</u>							
Forest Service	--	875	2,010,380	14,900	7,400	40	2,033,595
Bureau of Land Management	--	470	835,660	--	--	80	836,210
National Park Service	--	120	57,050	78,930	21,500	1,400	159,000
Bureau of Sport Fisheries and Wildlife	--	--	--	--	--	--	--
Total Federal (Available for Recreation)	--	1,465	2,903,090	93,830	28,900	1,520	3,028,805
Federal Lands not Available for Recreation							326,195
<u>State</u>	--	--	23,110	--	--	--	23,110
<u>Local</u> ^{1/}	290	260	400	--	--	220	1,170
Total Public (Available for Recreation)	290	1,725	2,926,600	93,830	28,900	1,740	3,053,085
Public Lands not Available for Recreation							1,981,915
<u>Private</u>							
Indian Trust ^{2/}							7,282,290
Other Private	2,812	1,086	2,373,062	40	0	0	2,377,000
Total Private (Available for Recreation)							9,659,290
Private Lands not Available for Recreation ^{3/}							2,557,710
Total Subregion (Available for Recreation)							12,712,375
Subregion Lands not Available for Recreation							4,539,625

1/ Includes cities, counties, districts, etc.

2/ Not inventoried by Recreation Land Class.

3/ A portion of these lands may be available for recreation but have not been inventoried.

TABLE A-17
DEMAND, SUPPLY AND NEEDS
LITTLE COLORADO SUBREGION
(MODIFIED OBE-ERS)

TARGET YEAR (CUMULATIVE TOTALS)	1965 SUPPLY RECREATION DAYS (1000)			DEMAND RECREATION DAYS (1000)	UNSATISFIED DEMAND RECREATION DAYS (1000)
	PUBLIC	PRIVATE	TOTAL		
Class I					
1965	928	307	1,235	3,068	1,833
1980				6,172	4,937
2000				10,744	9,509
2020				17,303	16,068
Class II					
1965	2,227	1,158	3,386	11,582	8,197
1980				21,110	17,725
2000				37,224	33,838
2020				59,489	56,104
Class III ^{1/}					
1965	12,962	58,446	71,408	3,752	--
1980				6,839	--
2000				12,058	--
2020				19,271	--
Class IV ^{1/}					
1965	141	--	141	489	
1980				892	
2000				1,573	
2020				2,514	
Class V ^{1/}					
1965	1	--	1	489	
1980				892	
2000				1,573	
2020				2,514	

XII-A-52

^{1/} Unsatisfied Class IV and Class V demand will have to be satisfied by Class III supply.

TABLE A-18
 ADDITIONAL DEVELOPMENT AND
 LAND ACQUISITION
 NEEDS
 LITTLE COLORADO SUBREGION
 (MODIFIED OBE-ERS)

TARGET YEAR (CUM. TOTALS)	DEVELOPMENT NEEDS ^{1/} (REC. DAYS 1000)		NON-FEDERAL LAND ACQUISITION NEEDS ^{2/} (ACRES)
	FEDERAL	NON-FEDERAL	
Class I			
1965	--	1,833	570
1980	--	4,937	1,540
2000	1,040	8,469	2,650
2020	1,300	14,768	4,650
Class II			
1965	--	8,197	6,300
1980	1,509	16,216	12,470
2000	16,542	17,296	13,300
2020	22,751	33,353	25,660

XII-A-53

1/ Federal development requirements are based on planned future Federal programs and apparent need with regard to resource ownership and distribution. The remaining development was allocated to the non-Federal sector.

2/ Satisfying these acquisition needs is a non-Federal responsibility only. The Federal development needs will be satisfied on existing lands through increased capacities as well as a shift of some lands from Class III multiple use to other single-purpose recreation classes. Estimates of this (cumulative) acreage shift for 1980, 2000 and 2020 are as follows: 381,700; 674,200; 894,900.

TABLE A-19
 COST OF SATISFYING NEEDS
 (CUMULATIVE TOTALS)
 LITTLE COLORADO SUBREGION
 (MODIFIED OBE-ERS)

TARGET YEAR	SECTOR OF ECONOMY	CLASS I			CLASS II		
		DEVELOPMENT AND OPERATION COSTS (DOLLARS)		LAND ACQUISITION COST (DOLLARS)	DEVELOPMENT AND OPERATION COSTS (DOLLARS)		LAND ACQUISITION COST (DOLLARS)
		DEVEL.	O.M.&R.(1)		DEVEL.	O.M.&R.(1)	
1980	FEDERAL	--	--	--	6,034,800	452,600	--
	NON-FEDERAL	9,874,600	2,468,600	6,160,000	64,864,400	4,864,800	6,858,500
2000	FEDERAL	2,080,000	520,000	--	66,167,600	4,962,600	--
	NON-FEDERAL	16,937,400	4,234,400	10,600,000	69,184,000	5,188,800	7,315,000
2020	FEDERAL	2,600,000	650,000	--	91,002,400	6,825,200	--
	NON-FEDERAL	29,537,000	7,384,200	18,480,000	133,412,400	10,005,900	14,113,000

(1) Includes annual operation, maintenance and replacement costs for the target year levels of development.

OBE-ERS Recreation Plan for the Lower Colorado Region

All discussion of recreation needs and means and cost of meeting needs in this Appendix has been related to Modified OBE-ERS population projections. There is another set of population projections called the OBE-ERS Plan, which reflects a different pattern of future growth and development. The major difference between these two plans appears in the distribution of population in the Lower Main Stem and Gila Subregions. In the OBE-ERS Plan, the Gila Subregion is relatively larger and the Lower Main Stem is relatively smaller. On the whole, however, the 2020 Regional populations differ by only about 200,000 people. Since demand is a function of the population, the OBE-ERS Plan recreation needs are accordingly different. The tables on the following pages indicate these differences.

OBE-ERS needs are somewhat less than the Modified OBE-ERS Plan. This is primarily because the OBE-ERS Plan is about 200,000 less in total regional population. The most significant difference between the two plans occurs in the Lower Main Stem Subregion. In that Subregion the needs are considerably less. The other Subregions remain roughly comparable. The table below shows the relative unsatisfied demand for Class I and Class II recreation opportunities as they differ for each plan:

Unsatisfied Demand (1000's Recreation Days)		
Subregion	Class I	
	(Modified OBE-ERS)	(OBE-ERS)
Lower Main Stem	72,513	60,630
Little Colorado	16,068	12,940
Gila	189,302	187,888
	Class II	
Lower Main Stem	145,358	138,720
Little Colorado	56,104	53,339
Gila	191,393	191,299

TABLE A-20
DEMAND, SUPPLY AND NEEDS
LOWER COLORADO REGION
(OBE-ERS)

TARGET YEAR (CUMULATIVE TOTALS)	PUBLIC	SUPPLY RECREATION DAYS (1000)		TOTAL	DEMAND RECREATION DAYS (1000)	UNSATISFIED DEMAND ^{1/} RECREATION DAYS (1000)
		PRIVATE				
Class I						
1965	24,088	3,741		27,829	37,410	14,083
1980					73,735	45,906
2000					155,773	127,944
2020					289,287	261,458
Class II						
1965	35,055	6,516		41,571	71,550	29,979
1980					129,688	88,117
2000					246,306	204,735
2020					424,929	383,358
Class III ^{2/}						
1965	190,561	125,453		316,014	23,178	--
1980					42,012	--
2000					79,789	--
2020					137,653	--
Class IV ^{2/}						
1965	7,643	--		7,643	3,023	
1980					5,480	
2000					10,407	
2020					17,955	
Class V ^{2/}						
1965	344	--		344	3,023	
1980					5,480	
2000					10,407	
2020					17,955	

^{1/} Because there was a surplus supply of some land classes in certain Subregions, the figures shown as needs represent cumulative Subregional needs and do not necessarily reflect differences between Regional demand and supply.

^{2/} Unsatisfied Class IV and Class V demand will have to be satisfied by Class III supply.

TABLE A-21
 ADDITIONAL DEVELOPMENT AND
 LAND ACQUISITION
 NEEDS
 LOWER COLORADO REGION
 (OBE-ERS)

TARGET YEAR (CUM. TOTALS)	DEVELOPMENT NEEDS ^{1/} (REC. DAYS 1000)		NON-FEDERAL LAND ACQUISITION NEEDS ^{2/} (ACRES)
	FEDERAL	NON-FEDERAL	
Class I			
1965	--	14,083	4,400
1980	4,820	41,086	12,840
2000	19,846	108,098	33,780
2020	40,900	220,558	68,930
Class II			
1965	--	29,979	23,060
1980	23,211	64,906	49,930
2000	69,889	134,846	103,730
2020	103,913	279,445	214,960

^{1/} Federal development requirements are based on planned future Federal programs and apparent need with regard to resource ownership and distribution. The remaining development was allocated to the non-Federal sector.

^{2/} Satisfying these acquisition needs is a non-Federal responsibility only. The Federal development needs will be satisfied on existing lands through increased capacities as well as a shift of some lands from Class III multiple use to other single-purpose recreation classes. Estimates of this (cumulative) acreage shift for 1980, 2000 and 2020 are as follows: 1,313,809; 1,631,709; 1,874,284.

TABLE A-22
 COST OF SATISFYING NEEDS
 (CUMULATIVE TOTALS)
 LOWER COLORADO REGION
 (OBE-ERS)

TARGET YEAR	SECTOR OF ECONOMY	CLASS I			CLASS II		
		DEVELOPMENT AND OPERATION COSTS (DOLLARS)		LAND ACQUISITION COST (DOLLARS)	DEVELOPMENT AND OPERATION COSTS (DOLLARS)		LAND ACQUISITION COST (DOLLARS)
		DEVEL.	O.M.&R.(1)		DEVEL.	O.M.&R.(1)	
1980	FEDERAL	9,640,600	2,410,100	--	92,845,600	6,963,300	--
	NON-FEDERAL	82,172,400	20,543,100	51,360,000	259,623,600	19,471,700	27,461,500
2000	FEDERAL	39,691,200	9,922,800	--	279,556,800	20,966,800	--
	NON-FEDERAL	216,196,600	54,049,200	135,120,000	539,382,800	40,453,700	57,051,500
2020	FEDERAL	81,800,000	20,450,000	--	415,652,800	31,174,000	--
	NON-FEDERAL	441,116,600	110,279,100	275,720,000	1,117,780,000	83,833,500	118,228,000

(1) Includes annual operation, maintenance and replacement costs for the target year levels of development.

TABLE A-23
DEVELOPMENT AND
LAND ACQUISITION NEEDS
FOR WATER BASED RECREATION
LOWER COLORADO REGION
(OBE-ERS)

TARGET YEAR (CUM. TOTALS)	DEVELOPMENT NEEDS ^{1/} (REC. DAYS 1000)		NON-FEDERAL LAND ACQUISITION NEEDS ^{2/} (ACRES)
	FEDERAL	NON-FEDERAL	
Class I			
1965	--	2,817	880
1980	964	8,217	2,568
2000	3,969	21,620	6,756
2020	8,180	44,112	13,786
Class II			
1965	--	10,493	8,071
1980	8,124	22,717	17,476
2000	24,461	47,196	36,306
2020	36,370	97,806	75,236

^{1/} Federal development requirements are based on planned future Federal programs and apparent need with regard to resource ownership and distribution. The remaining development was allocated to the non-Federal sector.

^{2/} Satisfying these acquisition needs is a non-Federal responsibility only. The Federal development needs will be satisfied on existing lands through increased capacities as well as a shift of some lands from Class III multiple use to other single-purpose recreation classes.

TABLE A-24
 COST OF SATISFYING WATER
 BASED RECREATION NEEDS
 (CUMULATIVE TOTALS)
 LOWER COLORADO REGION
 (OBE-ERS)

TARGET YEAR	SECTOR OF ECONOMY	CLASS I			CLASS II		
		DEVELOPMENT AND OPERATION COSTS (DOLLARS 1,000)		LAND ACQUISITION COST (DOLLARS 1,000)	DEVELOPMENT AND OPERATION COSTS (DOLLARS 1,000)		LAND ACQUISITION COST (DOLLARS 1,000)
		DEVEL.	O.M.&R.(1)		DEVEL.	O.M.&R.(1)	
1980	FEDERAL	1,928	482	--	32,496	2,343	--
	NON-FEDERAL	16,434	4,109	10,272	90,868	6,815	9,612
2000	FEDERAL	7,938	1,985	--	97,845	7,338	--
	NON-FEDERAL	43,239	10,810	27,024	188,784	14,159	19,968
2020	FEDERAL	16,360	4,090	--	145,478	10,911	--
	NON-FEDERAL	88,223	22,056	55,144	391,223	29,342	41,380

(1) Includes annual operation, maintenance and replacement costs for the target year levels of development.

09-V-V-IX

TABLE A-25
 ADDITIONAL WATER ACREAGE
 REQUIRED TO SATISFY BOATING NEEDS
 LOWER COLORADO REGION
 (OBE-ERS)

Subregion	Cumulative Acreage Needs			
	1965	1980	2000	2020
Lower Main Stem	--	--	--	--
Gila	--	--	27,920	84,900
Little Colorado	--	5,650	18,200	35,820
Regional Total	--	5,650	46,120	120,720

TABLE A-26
DEMAND, SUPPLY AND NEEDS
LOWER MAIN STEM SUBREGION
(OBE-ERS)

TARGET YEAR (CUMULATIVE TOTALS)	1965 SUPPLY RECREATION DAYS (1000)			DEMAND RECREATION DAYS (1000)	UNSATISFIED DEMAND RECREATION DAYS (1000)
	PUBLIC	PRIVATE	TOTAL		
Class I					
1965	10,192	632	10,824	6,322	--
1980				14,305	3,480
2000				34,737	23,913
2020				71,454	60,630
Class II					
1965	15,253	2,508	17,760	25,080	7,319
1980				46,100	28,340
2000				89,156	71,896
2020				156,481	138,720
Class III ^{1/}					
1965	99,670	14,998	114,668	8,124	--
1980				14,934	--
2000				28,882	--
2020				50,691	--
Class IV ^{1/}					
1965	4,003	--	4,003	1,060	
1980				1,948	
2000				3,767	
2020				6,612	
Class V ^{1/}					
1965	182	--	182	1,060	
1980				1,948	
2000				3,767	
2020				6,612	

XII-A-62

^{1/} Unsatisfied Class IV and Class V demand will have to be satisfied by Class III supply.

TABLE A-27
 ADDITIONAL DEVELOPMENT AND
 LAND ACQUISITION
 NEEDS
 LOWER MAIN STEM SUBREGION
 (OBE-ERS)

TARGET YEAR (CUM. TOTALS)	DEVELOPMENT NEEDS ^{1/} (REC. DAYS 1000)		NON-FEDERAL LAND ACQUISITION NEEDS ^{2/} (ACRES)
	FEDERAL	NON-FEDERAL	
Class I			
1965	--	--	--
1980	3,480	--	--
2000	11,604	12,309	3,850
2020	25,440	35,189	11,000
Class II			
1965	--	7,319	5,630
1980	4,975	23,365	17,930
2000	12,561	58,834	45,260
2020	25,455	113,266	87,130

^{1/} Federal development requirements are based on planned future Federal programs and apparent need with regard to resource ownership and distribution. The remaining development was allocated to the non-Federal sector.

^{2/} Satisfying these acquisition needs is a non-Federal responsibility only. The Federal development needs will be satisfied on existing lands through increased capacities as well as a shift of some lands from Class III multiple use to other single-purpose recreation classes. Estimates of this (cumulative) acreage shift for 1980, 2000 and 2020 are as follows: 892,209; 899,109; 911,884.

TABLE A-28
 COST OF SATISFYING NEEDS
 (CUMULATIVE TOTALS)
 LOWER MAIN STEM SUBREGION
 (OBE-ERS)

TARGET YEAR	SECTOR OF ECONOMY	CLASS I			CLASS II		
		DEVELOPMENT AND OPERATION COSTS (DOLLARS)		LAND ACQUISITION COST (DOLLARS)	DEVELOPMENT AND OPERATION COSTS (DOLLARS)		LAND ACQUISITION COST (DOLLARS)
		DEVEL.	O.M.&R.(1)		DEVEL.	O.M.&R.(1)	
1980	FEDERAL	6,961,000	1,740,200	--	19,898,800	1,492,400	--
	NON-FEDERAL	--	--	--	93,460,400	7,009,500	9,883,500
2000	FEDERAL	23,208,000	5,802,000	--	50,245,200	3,768,400	--
	NON-FEDERAL	24,618,200	6,154,600	15,400,000	235,337,600	17,650,300	24,893,000
2020	FEDERAL	50,880,000	12,720,000	--	101,818,400	7,636,400	--
	NON-FEDERAL	70,379,400	17,594,800	44,000,000	453,062,000	33,979,600	47,921,500

(1) Includes annual operation, maintenance and replacement costs for the target year levels of development.

XII-A-64

TABLE A-29
DEMAND, SUPPLY AND NEEDS
GILA SUBREGION
(OBE-ERS)

TARGET YEAR (CUMULATIVE TOTALS)	1965 SUPPLY RECREATION DAYS (1000)			DEMAND RECREATION DAYS (1000)	UNSATISFIED DEMAND RECREATION DAYS (1000)
	PUBLIC	PRIVATE	TOTAL		
Class I					
1965	12,968	2,802	15,770	28,020	12,250
1980				53,237	37,467
2000				111,066	95,296
2020				203,658	187,888
Class II					
1965	17,575	2,850	20,425	34,888	14,463
1980				62,774	42,349
2000				121,055	100,630
2020				211,724	191,299
Class III ^{1/}					
1965	77,929	52,009	129,938	11,302	--
1980				20,335	--
2000				39,215	--
2020				68,587	--
Class IV ^{1/}					
1965	3,499	--	3,499	1,474	
1980				2,652	
2000				5,115	
2020				8,946	
Class V ^{1/}					
1965	161	--	161	1,474	
1980				2,652	
2000				5,115	
2020				8,946	

XII-A-65

^{1/} Unsatisfied Class IV and Class V demand will have to be satisfied by Class III supply.

TABLE A-30
 ADDITIONAL DEVELOPMENT AND
 LAND ACQUISITION
 NEEDS
 GILA SUBREGION
 (OBE-ERS)

TARGET YEAR (CUM. TOTALS)	DEVELOPMENT NEEDS ^{1/} (REC. DAYS 1000)		NON-FEDERAL LAND ACQUISITION NEEDS ^{2/} (ACRES)
	FEDERAL	NON-FEDERAL	
Class I			
1965	--	12,250	3,830
1980	1,340	36,127	11,290
2000	7,202	88,094	27,530
2020	14,160	173,728	54,290
Class II			
1965	--	14,464	11,130
1980	16,728	25,622	19,710
2000	40,786	59,844	46,030
2020	55,708	135,592	104,300

^{1/} Federal development requirements are based on planned future Federal programs and apparent need with regard to resource ownership and distribution. The remaining development was allocated to the non-Federal sector.

^{2/} Satisfying these acquisition needs is a non-Federal responsibility only. The Federal development needs will be satisfied on existing lands through increased capacities as well as a shift of some lands from Class III multiple use to other single-purpose recreation classes. Estimates of this (cumulative) acreage shift for 1980, 2000 and 2020 are as follows: 39,900; 58,400; 67,500.

TABLE A-31
 COST OF SATISFYING NEEDS
 (CUMULATIVE TOTALS)
 GILA SUBREGION
 (OBE-ERS)

TARGET YEAR	SECTOR OF ECONOMY	CLASS I			CLASS II		
		DEVELOPMENT AND OPERATION COSTS (DOLLARS)		LAND ACQUISITION COST (DOLLARS)	DEVELOPMENT AND OPERATION COSTS (DOLLARS)		LAND ACQUISITION COST (DOLLARS)
		DEVEL.	O.M.&R.(1)		DEVEL.	O.M.&R.(1)	
1980	FEDERAL	2,679,600	669,900	--	66,912,000	5,018,000	
	NON-FEDERAL	72,254,400	18,063,600	45,160,000	102,486,800	7,686,500	10,840,000
2000	FEDERAL	14,403,200	3,600,800	--	163,144,000	12,235,800	--
	NON-FEDERAL	176,189,000	44,047,200	110,120,000	239,376,000	17,953,200	25,316,500
2020	FEDERAL	28,320,000	7,080,000	--	222,832,000	16,712,400	--
	NON-FEDERAL	347,456,600	86,864,100	217,160,000	542,366,000	40,677,500	57,365,000

(1) Includes annual operation, maintenance and replacement costs for the target year levels of development.

XII-A-67

TABLE A-32
DEMAND, SUPPLY AND NEEDS
LITTLE COLORADO SUBREGION
(OBE-ERS)

TARGET YEAR (CUMULATIVE TOTALS)	1965 SUPPLY RECREATION DAYS (1000)			DEMAND RECREATION DAYS (1000)	UNSATISFIED DEMAND RECREATION DAYS (1000)
	PUBLIC	PRIVATE	TOTAL		
Class I					
1965	928	307	1,235	3,068	1,833
1980				6,194	4,959
2000				9,970	8,735
2020				14,175	12,940
Class II					
1965	2,227	1,158	3,385	11,582	8,197
1980				20,813	17,428
2000				36,095	32,709
2020				56,724	53,339
Class III ^{1/}					
1965	12,962	58,446	71,408	3,752	--
1980				6,742	--
2000				11,693	--
2020				18,375	--
Class IV ^{1/}					
1965	141	--	141	489	
1980				879	
2000				1,525	
2020				2,397	
Class V ^{1/}					
1965	740	--	740	489	
1980				879	
2000				1,525	
2020				2,397	

XII-A-68

^{1/} Unsatisfied Class IV and Class V demand will have to be satisfied by Class III supply.

TABLE A-33
 ADDITIONAL DEVELOPMENT AND
 LAND ACQUISITION
 NEEDS
 LITTLE COLORADO SUBREGION
 (OBE-ERS)

TARGET YEAR (CUM. TOTALS)	DEVELOPMENT NEEDS ^{1/} (REC. DAYS 1000)		NON-FEDERAL LAND ACQUISITION NEEDS ^{2/} (ACRES)
	FEDERAL	NON-FEDERAL	
Class I			
1965	--	1,833	570
1980	--	4,959	1,550
2000	1,040	7,695	2,400
2020	1,300	11,640	3,640
Class II			
1965	--	8,197	6,300
1980	1,509	15,919	12,250
2000	16,542	16,167	12,440
2020	22,751	30,588	23,530

XII-A-69

1/ Federal development requirements are based on planned future Federal programs and apparent need with regard to resource ownership and distribution. The remaining development was allocated to the non-Federal sector.

2/ Satisfying these acquisition needs is a non-Federal responsibility only. The Federal development needs will be satisfied on existing lands through increased capacities as well as a shift of some lands from Class III multiple use to other single-purpose recreation classes. Estimates of this (cumulative) acreage shift for 1980, 2000 and 2020 are as follows: 381,700; 674,200; 894,900.

TABLE A-34
 COST OF SATISFYING NEEDS
 (CUMULATIVE TOTALS)
 LITTLE COLORADO SUBREGION
 (OBE-ERS)

TARGET YEAR	SECTOR OF ECONOMY	CLASS I			CLASS II		
		DEVELOPMENT AND OPERATION COSTS (DOLLARS)		LAND ACQUISITION COST (DOLLARS)	DEVELOPMENT AND OPERATION COSTS (DOLLARS)		LAND ACQUISITION COST (DOLLARS)
		DEVEL.	O.M.&R.(1)		DEVEL.	O.M.&R.(1)	
1980	FEDERAL	--	--	--	6,034,800	452,600	--
	NON-FEDERAL	9,918,000	2,479,500	6,200,000	63,676,400	4,775,700	6,737,500
2000	FEDERAL	2,080,000	520,000	--	66,167,600	4,962,600	--
	NON-FEDERAL	15,389,400	3,847,400	9,600,000	64,669,200	4,850,200	6,842,000
2020	FEDERAL	2,600,000	650,000	--	91,002,400	6,825,200	--
	NON-FEDERAL	23,280,600	5,820,200	14,560,000	122,352,000	9,176,400	12,941,500

XII-A-70

☆ GPO 1980-574

(1) Includes annual operation, maintenance and replacement costs for the target year levels of development.