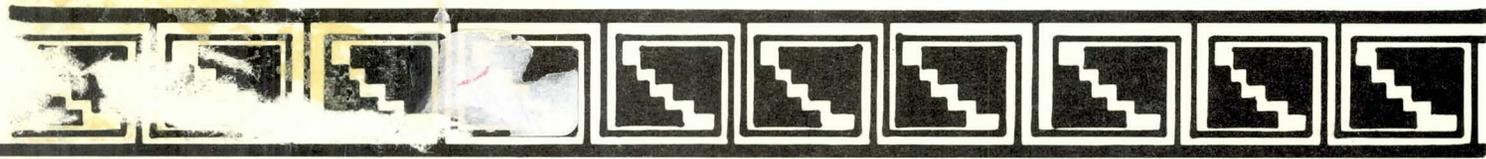
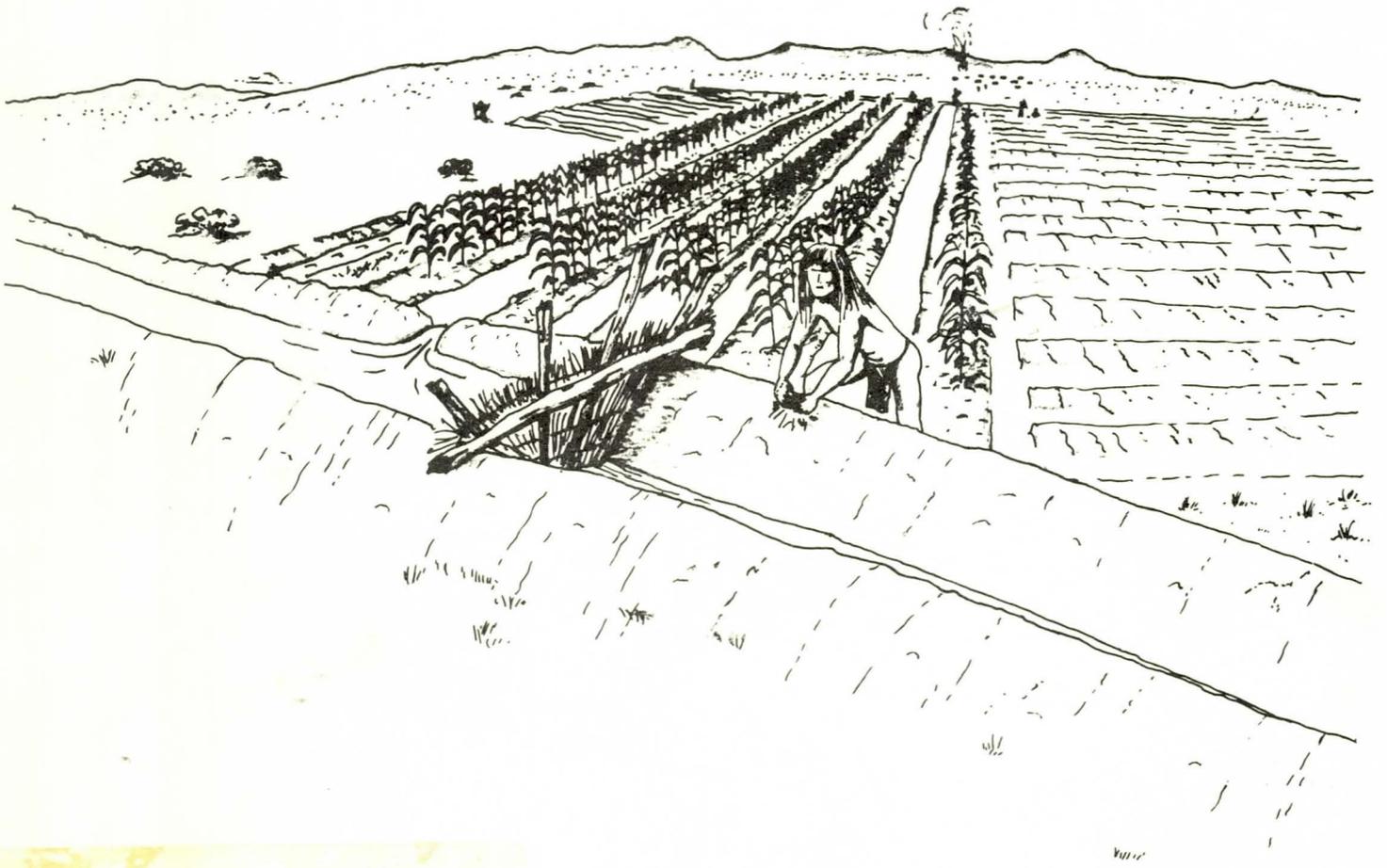


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HOHOKAM RESOURCE CONSERVATION AND DEVELOPMENT AREA PLAN



ON THE COVER

The ancient Hohokam Indians were the first to recognize the potential of the resources in south central Arizona. They were remarkable engineers, carving out sophisticated irrigation systems using only stone tools and lots of manpower. This civilization supported a larger rural population than actually tills the soil today.

The civilization vanished about 1400 CE, but their legacy remains. The modern canal systems in use today follow much the same alignments that the ancient engineers used.

The cover depicts a typical irrigated farm of the Hohokam era. The cover art and the other art in the plan was provided by the Gila River Indian Community.

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Hohokam RC&D Area

Land Ownership and Administration

Potential Well Production

Major Land Resource Areas & Annual Precipitation

Sediment Yield

NRCD and SCS Administrative Areas

HOHOKAM RESOURCE CONSERVATION AND DEVELOPMENT AREA PLAN

Prepared by the Hohokam RC&D Council, acting for the following sponsors:

WEST PINAL NRCD	ROOSEVELT WATER CONSERVATION DISTRICT
ELOY NRCD	SALT RIVER VALLEY WATER USERS ASSOCIATION
WINKELMAN NRCD	GILA RIVER INDIAN COMMUNITY
AGUA FRIA-NEW RIVER NRCD	CITY OF CHANDLER
BUCKEYE-ROOSEVELT NRCD	CITY OF GILBERT
EAST MARICOPA NRCD	CITY OF GLENDALE
GILA BEND NRCD	CITY OF MESA
FLORENCE-COOLIDGE NRCD	CITY OF SCOTTSDALE
TONTO NRCD	CITY OF TEMPE
WICKENBURG NRCD	TOWN OF BUCKEYE
BUCKEYE WATER CONSERVATION AND DRAINAGE DISTRICT	TOWN OF GILA BEND
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY	TOWN OF WICKENBURG
MARICOPA COUNTY MUNICIPAL WATER CONSERVATION DISTRICT # 1	MARICOPA COUNTY
McMICKEN IRRIGATION DISTRICT	PINAL COUNTY
ROOSEVELT IRRIGATION DISTRICT	GILA COUNTY
ADAMAN IRRIGATION WATER DELIVERY DISTRICT	

Assisted by U.S. Department of Agriculture
and cooperating federal, state, and local agencies.

Prepared under authority of the
Agriculture and Food Act of 1981 (PL97-98)

USDA, Soil Conservation Service
Phoenix, Arizona

FOREWORD

This area plan of Action represents the culmination of many years of work by our sponsors to provide RC&D program assistance throughout the south-central part of the state. Gila and Pinal counties were authorized to receive program assistance by the Secretary of Agriculture in 1983.

Sponsors have worked since that time to develop the framework for resource conservation which is presented here. The knowledge and expertise of both rural and urban sponsors are represented by the wide array of resource needs and opportunities identified.

We thank all those who participated in our regional planning meetings. These people provided a sound basis for identifying projects and evaluating problems. They also provided the priorities for the measures which affect their areas. These priorities are reflected in this area plan.

The proposals presented here represent the views of many citizens in both the public and private sectors. The program is designed to accelerate services beyond what is presently available, and to bring new kinds of assistance to bear on problems that have not yet been approached. Our program is open-ended, with a view toward maintaining flexibility in dealing with changing resource demands.

We will seek technical and financial assistance from federal, state, and local agencies. We also seek to incorporate private investment in sound resource management and development. To this end we encourage cooperation among agencies at all levels to carry out programs which address problems and opportunities dealing with flood and erosion control, water conservation and quality, air pollution, waste control, and the broad spectrum of social and economic issues so critical to our state's well being.

This plan presents the basic data and evaluation of problems to serve as a springboard for action on a wide front. We know that this plan will make our area a better place for all of us to live. We look forward to carrying out this mission with confidence and enthusiasm.

ACKNOWLEDGEMENTS

The Council appreciates the time, materials, information, and assistance provided by the organizations and individuals who helped develop this plan:

ARIZONA DEPARTMENT OF WATER
RESOURCES

ARIZONA STATE LAND DEPARTMENT

CENTRAL ARIZONA ASSOCIATION OF
GOVERNMENTS

CENTRAL ARIZONA COLLEGE, ARAVAIPA
CAMPUS

MARICOPA ASSOCIATION OF
GOVERNMENTS

MARICOPA COUNTY PLANNING AND
DEVELOPMENT DEPARTMENT

GILA COUNTY PLANNING DEPARTMENT

PINAL COUNTY PLANNING DEPARTMENT

AGRICULTURAL STABILIZATION AND
CONSERVATION SERVICE

SOIL CONSERVATION SERVICE

COOPERATIVE EXTENSION SERVICE

FARMERS HOME ADMINISTRATION

BUREAU OF LAND MANAGEMENT

UNITED STATES GEOLOGICAL SURVEY

ECONOMIC DEVELOPMENT
ADMINISTRATION

ARIZONA DEPARTMENT OF COMMERCE

ARIZONA STATE PARKS BOARD

U.S. FOREST SERVICE

BUREAU OF INDIAN AFFAIRS
ARIZONA ASSOCIATION OF
CONSERVATION DISTRICTS

Special thanks to:

Bill "Buckeye" Smeltz

Walter Meyer

Gila River Indian Community



OFFICE OF THE GOVERNOR
STATE HOUSE
PHOENIX, ARIZONA 85007
November 20, 1985

IN REPLY
REFER TO:

BRUCE BABBITT
GOVERNOR

Mr. Will Williams, Chairman
Hohokam Resource Conservation
and Development Council
110 N. Oregon
Chandler, Arizona 85224

Dear Mr. Williams:

The Hohokam Resource Conservation and Development (RC&D) Council is to be commended for the work that has gone into the recently published draft area plan for the Hohokam RC&D Area. The RC&D program is a vital asset to the State of Arizona and the role it plays in natural resource conservation and economic development will become even more important to our state in the future.

The State of Arizona will continue to support and encourage the RC&D program as it strives to improve the quality of life in our state.

Sincerely,

Bruce Babbitt
Governor

BB:dpb

SUMMARY

The Hohokam Resource Conservation and Development (RC&D) Area reflects all of Arizona's unique natural, social and cultural resources. It stretches from the cool, moist Coniferous Forest in the northeast corner of the Area to the hot, dry Lower Sonoran Desert along its west boundary. Mountain streams bubble down the boulder strewn watercourses under the Mogollon Rim. Only a few miles away and downstream, they are replaced by the dry arroyos of the desert which flow only infrequently following intense summer thunderstorms.

Within this land of contrast is the largest population center in Arizona as well as sparsely settled ranch country in the middle of a National Forest. There is evidence of the prehistoric Hohokam culture and parts or all of nine present day Indian reservations. Mining and agriculture, two of the basic industries which were instrumental in settling the Arizona territory, continue to play a major but declining economic role in the Area.

There is indeed a great demand placed on the land, water and related natural resources because of this diversity. Conflicts flare between land users. Competition for water stretches the limited supply to dangerous limits. Because of these conflicts and demands, the six Natural Resource Conservation Districts in Maricopa County sought support from other sponsors in the County and formed the Hohokam RC&D Area.

The Area received authorization for operations in 1972. The sponsors began a process of communication and sharing which has resulted in reducing the resource problems in the Area. However, because some of the Conservation Districts also reached into Gila and Pinal counties, the RC&D Council sought to include these counties in the Area. This was authorized by the Secretary of Agriculture in 1983 and is

the reason for this major revision of the Area Plan.

With this change the Hohokam RC&D Area expanded to 12.4 million acres and includes all of Gila, Maricopa and Pinal counties in south central Arizona. There are 32 incorporated communities, 20 irrigation districts, 2 Councils of Government, and numerous other local organizations in the area. At the present time, 30 of these organizations are sponsors of the Area.

Land ownership within the Hohokam RC&D Area is complex. The above table shows the ownership by major categories, but does not show how this is scattered into a complicated mosaic around the Area.

Land use changes are a common occurrence on all but the federal lands within the Hohokam Area. Urbanization in the Phoenix Metropolitan Area converted 80,000 acres from cropland to urban land in the ten years between 1972 and 1982. By the turn of the century, population is expected to reach 4 million in this metropolitan area. Similar growth rates are occurring in western Pinal and northern Gila counties. This will remove about 130,000 more acres from cropland.

Although most of this change is occurring on the private land, there is also change on the state and Indian lands. The Arizona State Land Department has begun a series of urban leases in the Phoenix and Scottsdale areas. These lands were formerly used for grazing or cropland. With assured water rights, several of the Indian tribes in the Area are beginning to develop additional cropland areas. Quite a bit of this land had had only limited grazing on it in the past.

<u>Status of Land Ownership</u>	<u>Percentage</u>
U.S. Forest Service	21.0
U.S. Bureau of Land Management	19.7
Indian Reservations	16.3
State of Arizona	15.4
Private/Corporate	20.5
Other*	7.1

*Other includes lands owned or administered by federal, state and local governments for defense and recreation purposes primarily.

Rapid change such as this often occurs faster than inventories can be made and adequate plans developed to prevent resource misuse. Conflicts arise as farmers and urbanites try to exist side-by-side. Dairies, swine producers, and feedlots become unwelcome. Flooding increases as land is covered with pavement and homes.

The Hohokam Council advocates and supports sound land use planning efforts to reduce these conflicts. We recognize the need to accelerate soil surveys in unsurveyed areas and to consolidate and update existing soil surveys. These surveys will help urban developers avoid problem areas and allow agriculturists to install efficient irrigation systems. They will also help ranchers, foresters, and recreation planners identify problem areas, improve their land, and reduce erosion.

Growth and change also impact the water quality and quantity. More people and new cropland require more water. Flooding increases as people encroach upon the floodplains or as land is covered with pavement and houses and runoff doubles or triples. More people dump increased amounts of waste products into the soil or water.

Most of the water supply for the Hohokam RC&D Area has traditionally come from groundwater. Even in those irrigation districts where some surface water is available from reservoirs on the Agua Fria, Gila, Salt, and Verde rivers, they depend on

groundwater for at least one-half or more of their total water needs. Such a heavy demand has resulted in a dramatic drop in the groundwater levels throughout much of the Area.

As a result, the State Legislature passed a Groundwater Management Act in 1980. This Act seeks to achieve a balance between pumping and inflow by the year 2025. It identified four Active Management Areas (AMAs) in which the groundwater drop was especially heavy. The water users within each of these AMAs will be responsible for reducing water use in order to meet the goal of the Act. Most of the Phoenix and Pinal AMAs and a small part of the Tucson AMA are within the Hohokam RC&D Area.

In 1985, the Central Arizona Project (CAP) delivered the first water from the Colorado River to users in Maricopa County. As the various cities and irrigation districts receive their allotments of CAP waters, they must reduce their pumping of groundwater by an equal amount. However, many of these groups must also develop the systems to receive and distribute this water.

Approximately 87 percent of all the water used in the Area today is for agriculture. Shortly after the year 2000 it is predicted that this will drop to 71 percent. The major change will take place in Maricopa County where the municipal and industrial use will increase from 18 percent to nearly 43 percent. In an attempt to insure a future increase from 18 percent to nearly 43

percent. In an attempt to insure a future supply, some of the cities in Maricopa County have purchased farmland in other counties to acquire the water rights.

The result of all these actions is an urgent need to conserve water, build delivery systems, and develop new supplies to serve the Area. Plans must be prepared to make optimum use of all water and to reduce any unnecessary or inefficient uses. Lands which are taken out of crops must be stabilized to prevent wind erosion. The Hohokam RC&D Council considers these efforts to be of prime importance.

Flood problems plague a large portion of the Area. Damaging floods have occurred along the Salt, Gila, Santa Cruz, San Pedro, and Agua Fria Rivers since 1979. The Santa Cruz, in particular, offers a serious challenge because of the heavy siltation in its channel. As a result, it has topped its banks more frequently and swept over larger portions of the floodplain.

High intensity, summer thunderstorms wreak havoc in many smaller drainages throughout the Hohokam Area. Many small communities without a sufficient tax base find it difficult to solve these problems. As a result, they are often unable to attract new industries or development. The larger, faster growing cities often find that new developments create new flood problems in our relatively flat alluvial valleys.

Problems of this nature can only be solved as people throughout a watershed or river basin work together. The cost of projects to provide flood protection or control is high. But, the threat to life in our rapidly growing area increases yearly and must be reduced through a federal, state, and local planning and construction effort. The Hohokam RC&D Council places a high priority on finding solutions to this problem.

The land and water resources are the base which supports the plant, animal and human life of an area. When they are properly managed and wisely used the quality of life benefits. We believe that the consequences of not developing adequate inventories and plans for using our land and water resources

are too great to consider.

More people require more services, more food, more recreation, more roads, more jobs and more water. They demand a quality environment, but without proper understanding and education may quickly destroy that which they desire.

All of us acting together must find the proper balance that will ensure the future. We can maintain a base of agricultural land which is among the most productive in the world. We can preserve much of the riparian and upland wildlife habitats which support a wildlife population consisting of several rare and endangered species. We can help the rural communities find new industries to diversify their economic base. We can provide an adequate and varied recreation base to meet the needs of young and old. We can prevent waste and pollution of our valuable water resources.

Our objectives are to maintain a quality, natural resource base and to develop the economic potential. We believe that these apparently contradictory objectives are obtainable. The Hohokam RC&D Council will direct its activities toward meeting these goals through short-term work plans. Priorities for assistance have been established and will be updated each year. Financial and technical assistance, interagency coordination, and local initiative will be utilized to achieve these objectives.

ADOPTION OF PLAN

The Hohokam RC&D Council hereby adopts this Hohokam RC&D Area plan.

Hohokam RC&D Council, Arizona

By: Willis Williams
Willis Williams
Chairman

Date: 11-23-85

This action authorized at an official meeting of the Hohokam RC&D Council on November 23, 1985.

Attest: Bill Smeltz
Bill Smeltz
Secretary-Treasurer

PLAN OF ACTION

INTRODUCTION

The Resource Conservation and Development program was authorized under Public Law 74-46, 16 U.S.C. 590a-f; P.L. 87-703, as amended, 7 U.S.C. 1010-1011; and P.L. 97-98, 16 U.S.C. 3451-3461. It offered local people and agencies the opportunity to initiate and carry out a broad-based program of conservation and use, accelerated economic development, and reduced unemployment or under-employment with assistance from agencies of the U.S. Department of Agriculture.

This concept is based on the following principles:

----Prudent use, management, and protection of natural resources, with full consideration of the social and economic benefits to people as a fundamental requirement for improving the quality of life.

----People can develop and carry out an action-oriented resource conservation and development plan for their area if local leaders assume responsibility and bring to bear all available political, social, and economic forces to aid in the area's protection, improvement, and development.

This Hohokam RC&D Area Plan highlights the resource problems and concerns of people throughout the Area. It will serve to guide the Council as it seeks to serve as a catalytic agent through which local people may shape their future. Already we have seen larger investments for improvement and growth by private interests and local, state and federal agencies.

The following information about our objectives, policies, courses of action, and priorities are provided so that you may understand and join with us in this endeavor.

MAJOR COURSES OF ACTION

PRIORITIES

----Measure proposals will be considered and accepted if eligible. Measures may be initiated by agencies, organizations, or individuals.

----Technical assistance for measure implementation will be requested from appropriate federal, state, local, and private interests.

----Financial help in the form of loans and grants will be requested from federal, state, and local agencies to carry out measures which are not eligible for RC&D financial assistance.

----Financial and technical assistance may be provided to sponsors in carrying out eligible RC&D measures as shown in the plan of action.

----Measure plan development and implementation will be coordinated through the RC&D Council.

----Cooperation and assistance will be provided to the Arizona Council of RC&D's to prioritize financial assistance measures for all RC&D areas in the state, and to address problems of mutual statewide concern.

----This area plan will be reviewed annually, and revised or amended as needed.

----An annual plan of work will be developed.

----Position statements on specific areas of concern (see appendix for current position statements), will be encouraged and implemented.

Priorities for financially assisted RC&D measures will be determined on at least an annual basis by the RC&D council. Priorities for associated measures will be established at the time of adoption by the council on the basis of high, medium, or low priority. In general, priorities will be determined by the following criteria:

---- Potential to accelerate the conservation, development, and utilization of natural resources.

----Contribution to the general level of economic activity.

----A positive effect on the environment.

----Conformity to overall project objectives.

----Strong interest from local sponsors with the leadership ability and resources to carry out the project.

----The urgency of the project.

----The economic feasibility of the project.

----The number of people to benefit.

----The impact on physically deteriorated and economically depressed areas.

MAJOR POLICIES

----Encourage all existing and potential sponsors to be active in initiating RC&D measures through which their local goals and needs may be met.

----Promote coordination between agencies, groups, and individuals in the conservation and development of the natural resources.

----Encourage new industries and the expansion of existing industries in the rural communities of the area.

----Assist in the development of the recreational resources of the area by coordinating the efforts of many public and private interests.

----Provide assistance in compliance with all requirements respecting nondiscrimination as contained in the Civil Rights Act of 1964 and the regulations of the Secretary of Agriculture (7 CFR Sec. 15.1-15.12) which provide that no person in the United States shall, on the basis of race, color, or national origin, be excluded from participation in, be denied benefits of, or be subjected to discrimination under any activity receiving federal financial assistance.

----Quality in the natural resource base for sustained use.

----To develop, improve, and conserve the natural resources of the area.

----To give local leaders a chance to use all existing related programs in carrying out the program.

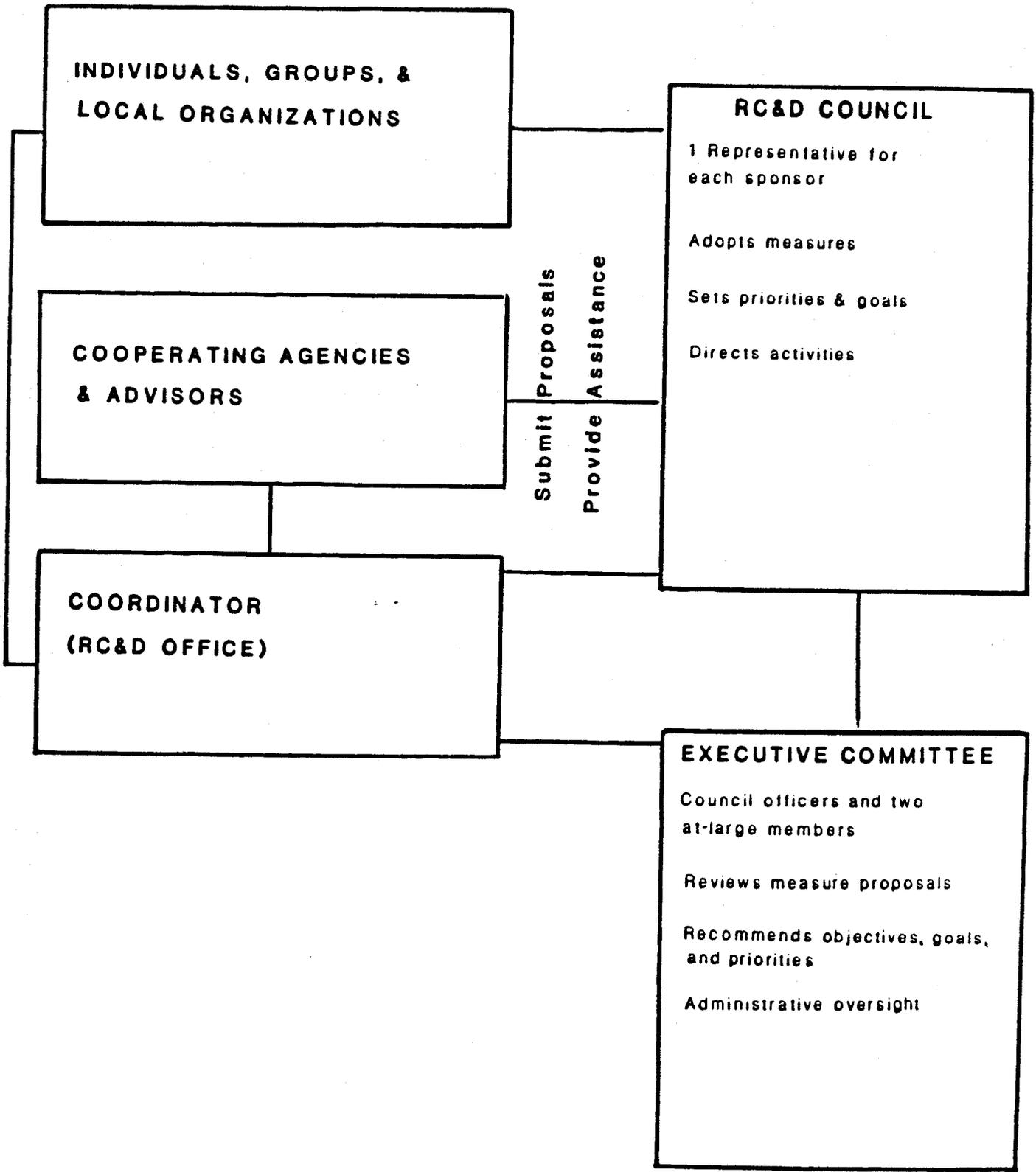
----To effectively plan and carry out the measures necessary to achieve the goals of the area.

KEY OBJECTIVES

----Develop the economic potential to provide sufficient income for better housing, utilities, health care, education, and other facilities that satisfy the basic human needs.

----Provide a satisfying cultural, historical, and recreational environment.

RC&D AREA ORGANIZATION



RC&D MEASURES

RC&D MEASURES

The following pages list the projects and actions, by priorities, which the RC&D council has adopted as RC&D Measures. They cover a broad spectrum of resource concerns, and include actions ranging from planning and construction to education and legislation.

These resource concerns were developed by local planning groups in various regions of the RC&D area. These groups, functioning as ad-hoc resource committees, identified local concerns and prioritized needed actions.

The priorities shown for the following measures are consolidated from the priority lists developed by the local groups. The council will provide assistance on the basis of these priorities. The council's three year operating plan reflects this system.

RC&D FINANCIAL AND TECHNICAL ASSISTANCE

Financial and technical assistance, when available, may be provided sponsors in carrying out eligible RC&D measures which have community benefits, have an RC&D measure plan covering the measure, and are sponsored by public bodies or public nonprofit corporations having authority and ability to install, operate, and maintain community-type measures.

Associated measures are actions other than RC&D financial assistance measures which are included or added to the RC&D Area plan. They are compatible with the objectives and goals of the RC&D Area. The RC&D Area sponsors plan and carry out associated measures, either as primary leaders or in a supporting role.

Summaries of RC&D financial assistance and associated measure categories may be found in the "Appendices" section.

KEY TO MEASURE LISTINGS

The data for each measure is displayed in a reading format. The sequence, from left to right is as follows:

- 1) RC&D Measure Number - Letter designates county (G=Gila, M=Maricopa, P=Pinal, A=Area-wide)
- 2) Measure Name
- 3) Type of Measure - (A)=Associated, (F)=Financially Assisted.
- 4) Measure Purpose
- 5) Sponsor(s)
- 6) Expected benefits
- 7) Estimated cost - "N/A" indicates no estimate available.
- 8) Type of assistance needed - "F"=financial, "T"=Technical
- 9) Year work is to begin. "C" indicates continued efforts expected over 2 or more years.

HIGH PRIORITIES

P102 On-farm Irrigation Systems Improvements

(A) Water Conservation Pinal Co. NRCDs
Reduced groundwater pumping. N/A F&T 1985 C.

P110 Picacho Reservoir Recreation Area
(A) Water Development Eloy NRCD
Recreation, water supply. N/A F&T 1987

P111 Pinal County Erosion Control
(A) Critical Area Treatment Pinal Co. NRCDs
Wind Erosion Control, Highway safety, N/A F&T 1986 C

P112 Buttes Dam Benefits Inventory
A) Resource Inventory Florence-Coolidge
Provide additional information to evaluate project. \$5,000 T 1986

P113 Santa Cruz Erosion/Flood Project
(A) Special Resource Study Eloy NRCD
Identify treatment alternatives. N/A F&T 1988 C

P114 Casa Grande Effluent Management
A) Water Quality West Pinal NRCD
Improve water use, environmental improvement. N/A T 1986

P089 McClellan Wash
(A) Flood Prevention Eloy NRCD
Protect Picacho, Eloy & Coolidge areas N/A F&T 1990

A115 Recreational Carrying Capacity Study
(A) Special Resource Study Winkelman NRCD
Identify critical use elements for sensitive rangelands. \$10,000 T 1987 C

A108 Economic Enhancement from Non-forage Plant Uses
(A) Range Improvement Winkelman NRCD
Protect rangelands from indiscriminate harvesting practices. \$1,000 T 1985 C

M099 Adaman Farm Irrigation
(F) Improve irrigation supply and conserve groundwater Adaman Irrigation District
Conserve water supply, stabilize ag. production. \$200,000 F&T 1986

P116 Intensive Public Information Program for Range Improvement
(A) Educational Winkelman NRCD
Accelerate rangeland management improvements. \$10,000 T 1986

P117 San Pedro Erosion Control
(A) Critical Area Treatment Winkelman NRCD
Identify feasible treatment alternatives for landowners. N/A F&T 1985 C

P118 Improved Irrigation Efficiency
(A) Water Conservation Winkelman NRCD
Reduce groundwater pumping along San Pedro River. N/A F&T 1986 C

P119 Gila-San Pedro Confluence Improvement
(A) Flood Prevention Winkelman NRCD
Protect Winkelman Area from flooding. N/A F&T 1987 C

P103 San Pedro Bridge
(A) Transportation/Access Improvement Winkelman NRCD
Safety, Economic Enhancement. \$10,000 F&T 1986

P105 Winkelman Energy Inventory
(A) Resource Inventory Winkelman NRCD
Identify impacts of reorganizing utility services. \$5,000 T 1985 C

G120 Copper Basin Economic Profile
(A) Resource Inventory CAAG
Rural economic enhancement. \$20,000 F&T 1985

A100 Economic Development District
(A) Economic Development CAAG
Additional funding for planning & development. \$5,000 T 1985

P121 Winkelman Area Soil Survey
(A) Resource Study Winkelman NRCD
Improved resource management. \$100,000 T 1987 C

A122 Improved Soil Erosion Data
(A) Resource Study Winkelman NRCD
Improved resource management. N/A T 1986 C

G123 Star Valley Erosion Control
(A) Critical Area Erosion Treatment Tonto
NRCD
Erosion control, sediment reduction. N/A
F&T 1987

G091 Bear Flat Campground
(A) Water Quality Tonto NRCD
Water quality improvement, recreation. N/A
F&T 1985 C

G124 Tonto Basin Erosion Control
A) Critical Area Treatment Tonto NRCD
Erosion Control, sediment reduction. N/A
F&T 1985 C

G107 Christopher Creek Bridge
(A) Highway Improvement Tonto NRCD
Flood prevention, Highway safety. N/A F
1985 C

G125 Tonto Range Improvement
(A) Rangeland Improvement Tonto NRCD
Economic enhancement. N/A F&T 1986 C

G094 Pine/Strawberry Soil Survey
(A) Resource Study Tonto NRCD
Improved resource management. \$5,000 T
1986

G102 Tonto Creek Bridge
(A) Transportation/Access Improvement
Tonto NRCD
Economic development, safety. N/A T
1985 C

G126 Light Industry Development
A) Economic Development Tonto NRCD
Improve economic base in Southern-Gila
County. N/A F&T 1986 C

M012 Buckeye Drainage
(F) Land Drainage Buckeye I.D.
Improved crop production. N/A F&T
1985 C

M127 Arlington Critical Area Treatment
(F) Critical Area Erosion Treatment
Buckeye NRCD
Erosion control along Gila River. N/A F&T
1987

M090 Hassayampa Water Management
(A) Water Development Wickenburg NRCD
Flood prevention, water conservation,
recreation. N/A F&T 1985 C

M096 Gila River Flood Management
(A) Surface Water Management Buckeye &
Gila Bend NRCDs
Flood erosion prevention, economic
enhancement. N/A F&T 1985 C

M032 RWCD Floodway
(A) Flood Prevention MCFCD
Flood & Erosion Control N/A F&T 1985 C

A165 Maricopa County Soil Survey Update
(A) Resource Study Maricopa NRCDs
Community Development \$20,000 T 1986

MEDIUM PRIORITY

P128 Noxious Weed Control
(A) Weed Control District Florence-Coolidge
NRCD
Reduce spread of weeds, increase farm
income. N/A T 1988 C

P129 Red Rock Irrigation System
(F) Farm Irrigation Eloy NRCD
Reduce groundwater overdraft, increased
supply. N/A F&T 1989

P165 Casa Grande Irrigation Reservoir
(F) Farm Irrigation West Pinal NRCD
Water conservation, increased supply.
\$200,000 F&T 1988

P104 GRIC River Basin Study
(A) Special Resource Study East Maricopa &
GRIC NRCD
Improve water resource planning, enhance
economy. \$250,000 T 1986

A130 Az. Game & Fish Coordination
(A) Resource Management Winkelman NRCD
Improved coordination of wildlife & range
resource management. N/A T 1986 C

A131 Recreational Usage Liability
(A) Ranch Enterprise Assistance Winkelman
NRCD
Protect ranch operators from undue
liability. N/A T 1986 C

A132 Ground Water Recharge
(A) Water Conservation Winkelman NRCD
Enhance groundwater supplies in San Pedro
river basin. N/A T 1987 C

P133 San Pedro River Water Quality
Improvement
(A) Water Quality Winkelman NRCD
Reduce pollutants and turbidity in surface
water. N/A T 1987 C

P134 Gila River Water Quality
Improvement
(A) Water Quality Winkelman NRCD
Reduce pollutants and turbidity in surface
water. N/A T 1987 C

A135 Recreational Vehicle Tax
(A) Legislation Winkelman NRCD
Reduce range deterioration caused by
recreational usage. N/A T 1988

A67 Local Land Use Planning
(A) Resource Development All NRCDs
Improve planning through use of sound
resource data. N/A T 1986 C

P135 Dripping Springs Valley Crossings
A) Transportation/Access Winkelman NRCD
Community improvement, safety. N/A
F&T 1986 C

A136 Improved Range Site Interpretation
(A) Resource Study Winkelman NRCD
Improved range management data base.
N/A T 1987

G 137 Tonto Water Conservation
(A) Water Conservation Tonto NRCD
Improved water supply in Tonto Basin. N/A
F&T 1988

A138 Waste Treatment Project Assistance
(A) Community Facilities CAAG
Improve water quality, community
development. N/A F&T 1989

A139 Watershed Vegetation Improvement
(A) Rangeland Improvement Tonto NRCD
Rangeland improvement, water quality &
supply improvement. N/A F&T 1990 C

A140 Circuit Riding Waste Treatment
Operator
(A) Community Services CAAG
Community development. N/A T 1986

G142 Young Soil Survey
(A) Special Study Tonto CAAG
Protect water quality, improve local
planning. N/A T 1986

M085 Central Az. Water Control
(A) Water Development Maricopa Co.
NRCDs
Flood prevention, water supply improvement
(Salt/Verde Rivers). N/A F 1986 C

A084 Urban Water Conservation
(A) Water Conservation Maricopa Co. NRCDs
Reduced groundwater usage. N/A T 1986 C

M143 Aguila-Salome-Wenden Irrigation
(A) Water Conservation Wickenburg NRCD
Reduced groundwater pumping, improved
farm economy. N/A F&T 1988

M144 Wickenburg Critical Area Treatment
(F) Critical Erosion Area Treatment Town of
Wickenburg
Reduced sedimentation, protect private &
public property. N/A F&T 1989

M 145 Little Rainbow Flood Control
(A) Flood Prevention Gila Bend NRCD
Protect farm & highways from flooding.
N/A F&T 1986 C

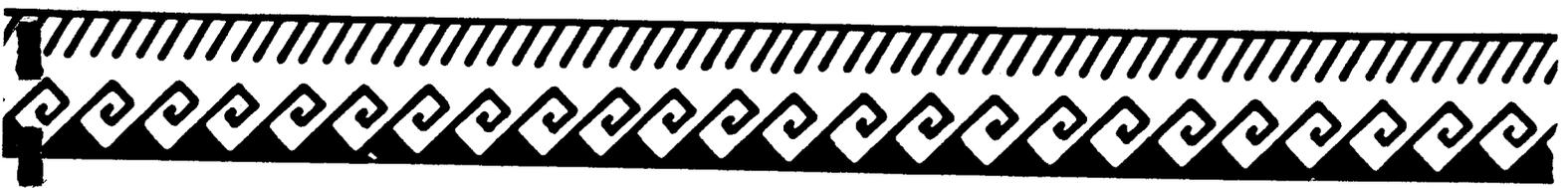
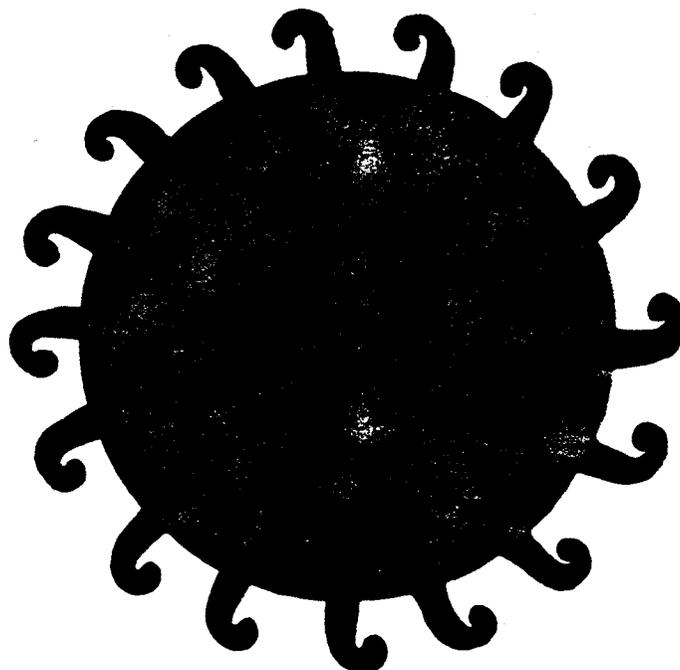
M146 Painted Rock Dam Water Use
(A) Water Development Gila Bend NRCD
Enhanced water supply in Gila Bend area,
productive use of improved flood waters.
N/A F&T 1990 C

M011 Harquahala Valley Irrigation
(A) Water Conservation Buckeye-Roosevelt
NRCD Reduced groundwater pumping,
improved farm economy. N/A F&T 1987 C

LOW PRIORITY

- P147 GRIC Salinity Reduction
(A) Farm Improvement East Maricopa NRCD
Improved crop production & water usage.
N/A T 1987 C
- A148 Wildcat Dumping
(A) Community Facilities Pinal County
Environmental enhancement, improved health. N/A T 1986 C
- A149 Sanitary District
(A) Community Facilities CAAG
Improved water quality, community development. N/A T 1988 C
- A150 Waste Water Training
(A) Community Services CAAG
Improved water quality, community development. N/A T 1986 C
- A151 Fire as Management Tool
(A) Resource Study Winkelman NRCD
Improved range forage & wildlife habitat.
N/A T 1986 C
- P152 Range Monitoring Program
(A) Rangeland Management Winkelman NRCD
Improved range management capabilities.
N/A T 1987 C
- P 153 Mammoth Critical Area Treatment
(F) Critical Erosion Area Treatment Town of Mammoth
Reduce erosion & sedimentation, protect property. N/A F&T 1989
- P154 Stream Turbidity Research
(A) Special Study Winkelman NRCD
Improve ability to manage water quality.
N/A T 1990
- P155 El Capitan Water Quality
(A) Water Quality Winkelman NRCD
Improve water quality of San Pedro River.
N/A T 1990
- P156 Improved Local Public Information
(A) Education Winkelman NRCD
Increased awareness of resource problems in Eastern Pinal County. N/A T 1986 C
- P157 Acid Rain Study
(A) Special Study Winkelman NRCD
Determine extent of damage, evaluate alternatives. N/A T 1989
- A158 Recreational Water Quality Planning
(A) Agency Coordination Tonto NRCD
Improved water quality. N/A T 1986 C
- P159 Gisela Erosion Control
(F) Critical Erosion Area Treatment Tonto NRCD
Reduced erosion & sedimentation, protect private property. N/A F&T 1991
- G160 San Carlos Range Inventory
(A) Resource Inventory Tonto NRCD
Improved range resource management. N/A T 1989
- G161 San Carlos Soil Survey
(A) Resource Study Tonto NRCD
Improved range resource management. N/A F&T 1988
- G162 Destination Tourism
(A) Economic Development Tonto NRCD
Diversify economy in Northern Gila County.
N/A T 1986 C
- P163 Gila River Water Conservation
(A) Water Conservation East Maricopa NRCD
Reduced ground water pumping. N/A F&T 1990 C
- M164 San Tan Irrigation
(A) Farm Irrigation East Maricopa NRCD
Improved water supply. N/A F&T 1986
- M077 Gilbert Flood Control
(F) Flood Prevention Town of Gilbert
Community flood protection. N/A F&T 1987

LOCATION, SETTING AND CLIMATE



LOCATION AND SETTING

The name "HOHOKAM" comes from an ancient civilization which flourished in central Arizona until the latter part of the fifteenth century. These people were farmers, and actually developed the first irrigation works to utilize the waters of the Gila and Salt rivers. Today's sophisticated irrigation systems are laid out along much the same lines as the ancient Indian developments.

The Hohokam Resource Conservation and Development Area is located in south-central Arizona. It includes the counties of Gila, Pinal, and Maricopa, and encompasses about twelve and one third million acres. The area contains over 60 percent of the irrigated cropland in Arizona.

Arizona's capitol and population center are located in Maricopa County, and the Phoenix vicinity continues to be one of the most rapidly growing areas in the United States. Pinal county is also experiencing accelerated growth, particularly in the Casa Grande area and along the corridor of Interstate 10.

There are some 34 incorporated cities and towns in the area, ten conservation districts, all or part of nine Indian reservations, twenty irrigation districts, one of the most active flood control districts in the country, and a number of local organizations with active interests in resource conservation. Many of these organizations and agencies are RC&D sponsors and supporters.

Maricopa County has long been the economic hub of Arizona. It has evolved from a farming and agri-business center into the financial and political hub of the state and much of the southwest. Agricultural lands have been giving way to rapid ubanization in the county, and high tech industries have been established as a significant part of the manufacturing economy. The Salt River

Project, the nation's first reclamation project, is more than 50 percent urbanized. It is projected to be almost totally urbanized around the turn of the century.

The county's primary resource problems are now focused on maintaining an adequate supply of water to support the burgeoning population, and finding ways to conserve available water. The farmlands around the periphery of the expected population growth have assumed higher priority for the installation of water saving conservation practices. Other significant problems include identifying, treating, and managing water quality problems, dealing with solid waste, containing hazardous wastes, and improving and maintaining air quality.

Pinal County has a largely agricultural based economy with a rapidly growing manufacturing sector. Cotton, grain, and vegetables are the mainstays of the farming operations. Most of the county's irrigated lands are contained within a groundwater management area which is under a state mandate to conserve water supplies. Irrigated lands receive a high priority for conservation treatment, and this trend is projected to continue.

The eastern part of the county is considered "mountain country", with emphasis on copper mining and cattle ranching. Some irrigated lands are located along the San Pedro River drainage, but the primary agricultural industry is ranching. The communities in this area have been hard hit by the recent years' downturn in the world copper market, with many mining operations slowing production or closing down. These communities are searching for ways to diversify their economies to ease the economic burden created by vagaries in the mining industry. Some of these communities are also burdened by significant flooding and erosion problems.

Gila County has the distinction of having virtually no private lands. The Tonto National Forest and the San Carlos and Fort Apache Indian reservations encompass virtually all of the county. The private lands are dispersed islands in a sea of public and Indian domain. Mining, recreation, tourism, and some lumbering are the primary economic activities. Ranching enterprises are carried on throughout the county, with small areas of irrigated farmlands devoted mostly to hay and pasture.

The mining communities of Globe and Miami have experienced the same economic hardship associated with copper mining described earlier. These communities do have some potential for diversifying their economies, particularly as retirement and recreation centers. The northern part of the county is a recreational playground for the Phoenix area population. Recreation usage is increasing rapidly, particularly near areas with streams or lakes, causing water quality and erosion problems. There are several areas throughout the county which experience flooding and erosion problems. The county is a significant watershed area for the Phoenix area population center's water supply, and thus its condition is crucial to the quantity and quality of that supply.

CLIMATE

The climate of south-central Arizona is one of its most important resources. It is generally mild, and well suited to both crops and people.

The warm, dry winters in the desert areas attract many winter visitors who have significant impacts on the economy. The upper elevations in the region have cool summer days, attracting throngs of recreationists from the hot deserts.

Annual rainfall varies from a low of about 6 inches to over 30 inches in the forested high country. Snow is common in areas above 3500 feet, but it is extremely rare in the deserts. Rainfall has been setting a new trend in recent years. It has been significantly above average from 1982 through 1984. During this same period, however, Phoenix set a record of 91 days with no measurable precipitation.

FREEZE DATES

Last 32° temperature in spring and first in fall
Arizona, 1980-1984

<u>Year</u>	<u>Last in spring</u>	<u>First in fall</u>
<u>Aguila</u>		
1980	April 3	Nov. 17
1981	Feb. 7	Nov. 20
1982	Apr. 8	Nov. 3
1983	Apr. 14	Nov. 21
1984	Mar. 7	Nov. 9
<u>Chandler Heights</u>		
1980	Feb. 11	Nov. 26
1981	Feb. 7	Nov. 26
1982	Feb. 3	Dec. 24
1983	Jan. 22	Nov. 20
1984	Feb. 27	Nov. 26
<u>Buckeye</u>		
1980	Feb. 12	Nov. 17
1981	Feb. 6	Nov. 26
1982	Mar. 6	Dec. 27
1983	Feb. 1	Nov. 27
1984	Jan. 29	Nov. 26
<u>Casa Grande</u>		
1980	Feb. 15	Nov. 25
1981	Feb. 8	Nov. 20
1982	Mar. 7	Oct. 29
1983	Apr. 5	Dec. 6
1984	Mar. 7	Nov. 26
<u>Payson</u>		
1980	May 25	Oct. 16
1981	May 21	Oct. 16
1982	May 13	Oct. 1
1983	May 6	Nov. 29
1984	May 1	Oct. 26

Source: National Oceanic and Atmospheric Administration

ALTITUDE, ANNUAL TEMPERATURE, AND RAINFALL

<u>City</u>	<u>Elevation</u>	<u>Average Maximum Temp.</u>	<u>Average Minimum Temp.</u>	<u>Average Precip (in.)</u>
Casa Grande	1,405	87.3	52.2	8.20
Gila Bend	737	89.5	54.4	5.69
Globe	3,540	77.6	47.2	15.75
Payson	4,982	70.9	34.8	21.48
Phoenix	1,117	85.1	55.4	7.05
Wickenburg	2,070	82.7	46.8	10.99

Source: NOAA

There are two rainfall seasons. The first occurs during winter from November to March, when the area is subjected to Pacific-generated storms. These rains are normally gentle. However, major shifts of the jet stream have caused intense, long duration storms with resultant floods. Examples occurred in several years from 1979 to 1983.

The second rainy season occurs in July, August, and part of September. Moist air moves into the state from the south and causes widespread thunderstorm activity. This is often referred to as a "monsoon". A monsoon day is defined as a day with an average dew point 55 degrees or higher. The record for consecutive monsoon days in Phoenix is 72. The monsoon brings with it an uncomfortable combination of heat and humidity in the deserts.

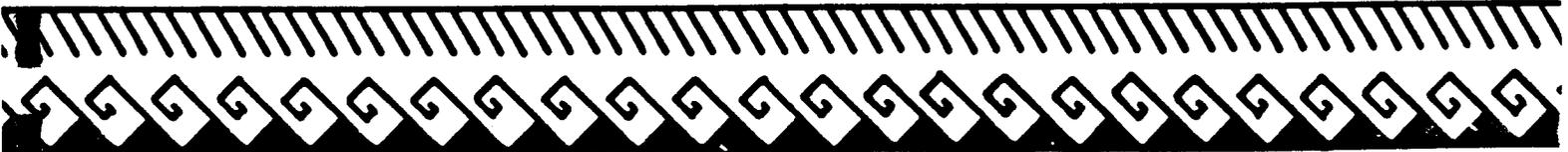
The intensity of these summer storms varies greatly, as does their location. Generally, the heaviest amounts of precipitation over short periods of time are received from these storms. They are responsible for many local flooding problems.

Annual evaporation rates are generally high throughout the area. A maximum amount of about 75 inches occurs in the lowest deserts, and decreases to around 64 inches in the higher elevations.

Growing seasons range from 295 days in the deserts to about 120 days in the highlands. The desert growing season is ideal for many crops. A wide variety of vegetables are grown in addition to cotton, grain, and citrus. The mild winters allow double cropping of some vegetables, such as lettuce. Cooler temperatures and greater rainfall amounts in the higher elevations provide productive grazing lands.

The Annual Precipitation and The Major Land Resource Areas map and discussion in the rangeland section provides further information about the climate.

LAND RESOURCES



LAND OWNERSHIP

The RC&D boundary includes a total land area of about 12,325,000 acres. Public domain lands are by far the largest percentage of all lands in the area. These include lands administered by the Forest Service, Bureau of Land Management, Arizona State Land Department, Department of Defense, Bureau of Reclamation, and the National Park Service. Indian Trust lands comprise about 21 percent of the area.

Gila County is unique in that only about four percent of its lands are privately owned. This is a limiting factor for substantial growth in the county. By comparison, about twenty percent of Pinal and thirty percent of Maricopa counties are privately owned.

Patterns of land ownership are sometimes a barrier to development and effective resource management. The state recently enacted the "Urban Lands Act." It aims to make some state trust lands available for urban development where those lands are in close proximity to major urban centers. This has considerable impact on state lands immediately north of the Phoenix metropolitan area.

NON-INDIAN RANGELAND OWNERSHIP BY NRCD (PERCENTAGES)

<u>NRCD</u>	<u>Private</u>	<u>State</u>	<u>National Forest</u>	<u>BLM</u>
Gila Bend	6.3	3.0	0	90.7
Buckeye Roosevelt	7.0	5.1	0	87.9
Wickenburg	11.5	10.1	0	78.4
East Maricopa	12.6	29.9	52.6	4.9
Agua Fria-New River	26.0	32.7	0	41.3
Winkelman	20.0	47.0	11.0	22.0
Florence-Coolidge	11.0	60.0	0	29.0
Tonto	2.4	.1	97.2	.3

LAND USE

Land usage is undergoing rapid change in parts of Maricopa and Pinal counties, continuing a decade-long pattern of explosive population growth. This growth is expected to continue well into the next century. The predicted doubling of the metropolitan Phoenix area population portends radical changes in land use there.

About 21 percent of Maricopa County's land area is within the Phoenix Urban Planning Area. This area includes 15 municipalities, and continues to be one of the most rapidly urbanizing areas in the country. About 80,000 acres of cropland were converted to urban uses in this area from 1972 to 1982. With present trends another 128,000 acres of cropland will be urbanized by the end of the century.

In Pinal County, the Casa Grande, Apache Junction, Eloy/Arizona City, and Oracle areas are experiencing rapid growth and are predicted to continue to do so. Most of the growth is expected in the transportation corridor along Interstate 10 in the western part of the county. However, west-central Pinal County is expected to remain primarily an agricultural center into the next century.

In Gila County, the areas around Payson, Pine, Strawberry, and Young have the greatest growth potential due to their recreational attractiveness. Most of the private undeveloped lands in these areas are now used for limited grazing and incidental recreation.

The "Copper Basin" communities in southern Gila County and along the San Pedro River in eastern Pinal County are in a period of decline or very little growth due to the depressed condition of the copper industry the past few years. They have some potential for growth if the mining industry improves, as new industries are acquired, and as recreational or retirement usages increase.

A current trend is for municipalities to buy agricultural lands for their water supply and retire these lands from agricultural production. The City of Mesa has purchased several thousand acres in the Florence-Coolidge area of Pinal County. More acquisitions by cities are likely.

Conflicting land uses are becoming a problem as urban and agricultural uses overlap. Problems with pesticide usage, odors, and dust are common as new subdivisions invade farming areas.

Indian lands have tremendous potential for land use change. The Gila River and Salt River reservations in particular could develop thousands of acres of irrigated cropland if tribal leaders so choose. The Fort McDowell Reservation is in the process of developing a large tribal farm. These lands also have potential for industrial and residential developments.

Opportunities for Action

Utilize the USDA Land Evaluation and Site Assessment (LESA) System to provide a resource-based mechanism for decision making.

Plan for orderly growth to maximize the productive years for agricultural lands.

Utilize "Geographic Information Systems" for planning purposes.

Promote more coordination of planning efforts among counties.

Accelerate comprehensive planning efforts in Pinal and Gila counties.

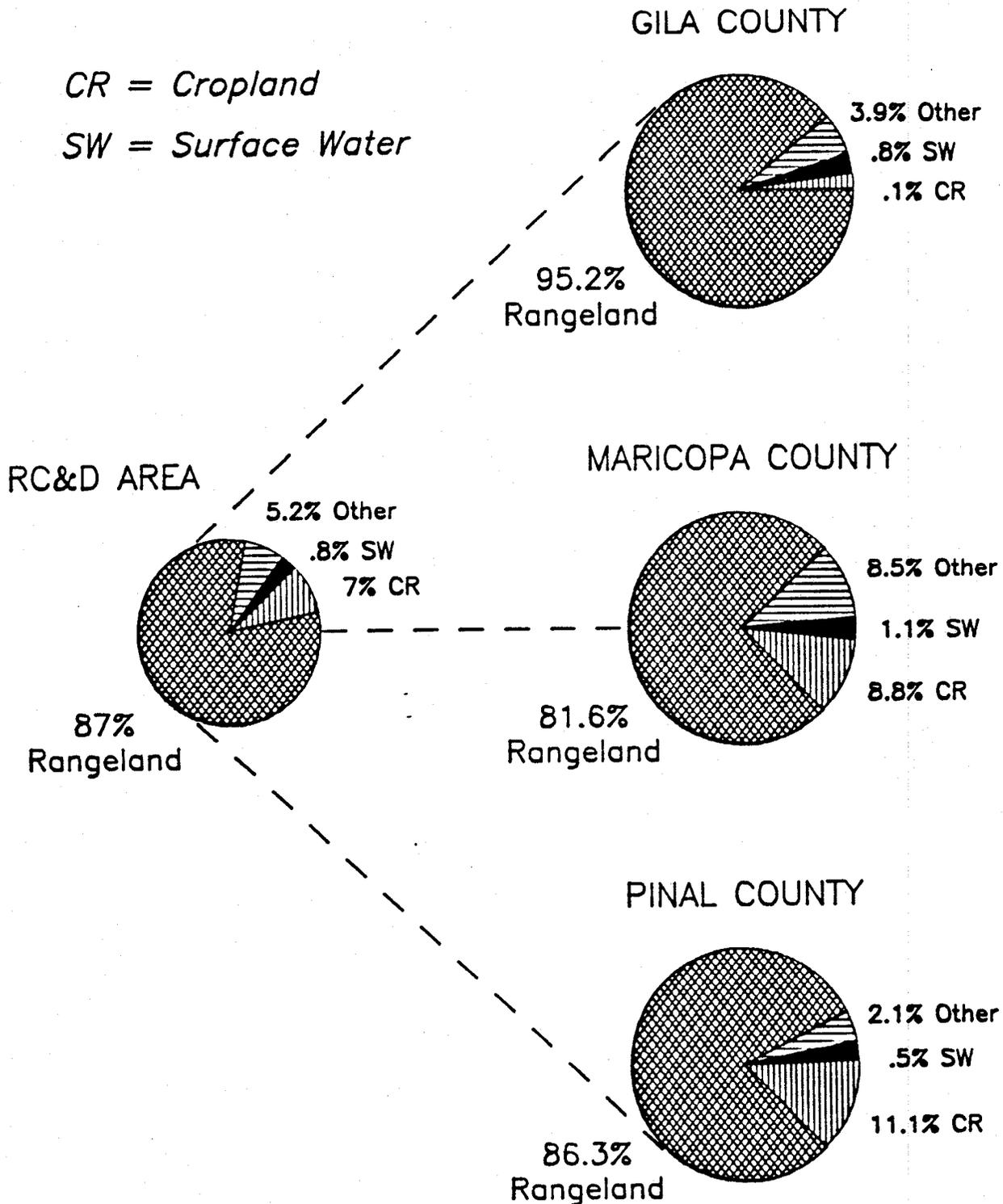
Develop guidelines to use and protect agricultural lands which are retired from production to provide water to municipalities.

Accelerate planning efforts on Indian lands to ensure practical, effective, and culturally acceptable developments.

LAND USE

CR = Cropland

SW = Surface Water



Source: NRCD Long Range Programs and individual county plans

Note: Graphic proportions have been adjusted on smaller percentages for visual comparison.

SOIL

Soil is a natural body on the surface of the earth. The characteristics and properties of a soil are determined by physical and chemical processes resulting from the factors of climate, living organisms, time, topography, and parent material. The influence of any one of these factors varies from place to place, but the interaction of all of them determines the kind of soil that forms.

Soils occur on the landscape in an orderly pattern that is related to the geology, landforms, and vegetation. Each kind of soil is associated with a particular kind or segment of the landscape. Figure "A" shows a representative pattern of soils in the Phoenix area.

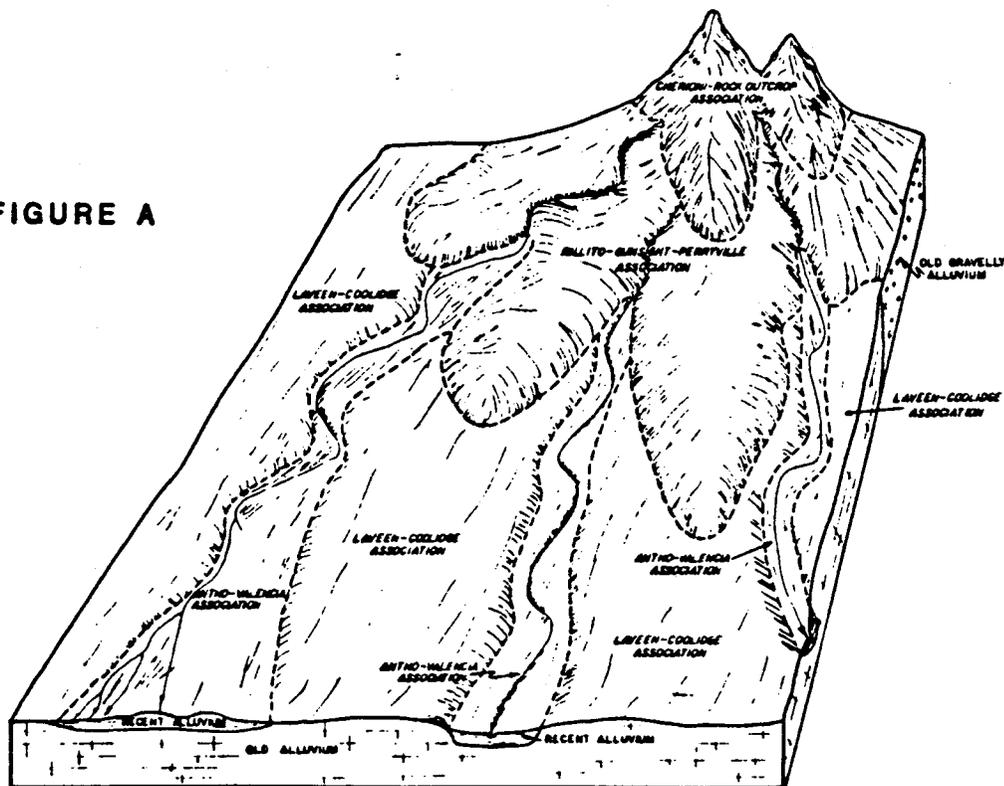
The typical groupings represent shallow soils in the mountains, rocky soils at the base of mountains, soils with less rock and large amounts of lime, and soils in drainageways that flood. Names used are for descriptive purposes. See published soil surveys for more detail.

Great differences in soil properties can occur within short distances. Some soils along the Gila, San Pedro, and other drainageways are wet or subject to flooding. Some are shallow to bedrock. These shallow soils are found in the many mountain ranges in the area. Figure "A-2" shows a representative soil pattern in the San Pedro River Valley.

Knowledge of individual soil properties, characteristics, and limitations for use is necessary to formulate land use plans and implement projects. Soil scientists have observed and described the soils in many parts of the RC&D area and related their occurrence to specific segments of the landscape in soil survey reports.

Soil surveys highlight limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment. They contain predictions of soil behavior for selected land uses.

FIGURE A



In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management.

There is a lack of soil survey information in some locations. In some cases, existing soil survey information is not used as widely as it should be. Some existing soil survey data is over 25 years old, and does not meet current planning needs.

Substantial soil related problems exist throughout the area. Areas of salt and sodium affected soils impose limitations for all land uses. High shrink-swell soils are common, and require special planning and design considerations. Some soils are susceptible to high erosion rates when improperly managed.

Detailed soil surveys have been completed in many parts of the RC&D area. The soil survey progress map displays the status of soil surveys in the area as of this publication date. Help in using published soil surveys and access to on-going survey information is available at local offices of the Soil Conservation Service.

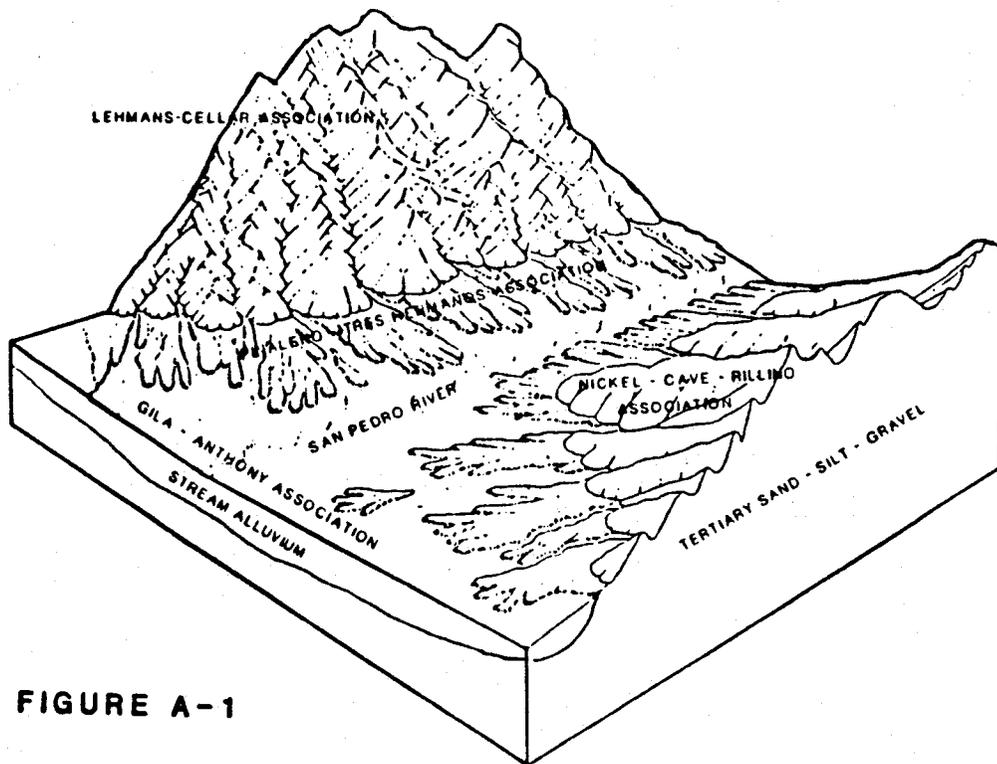
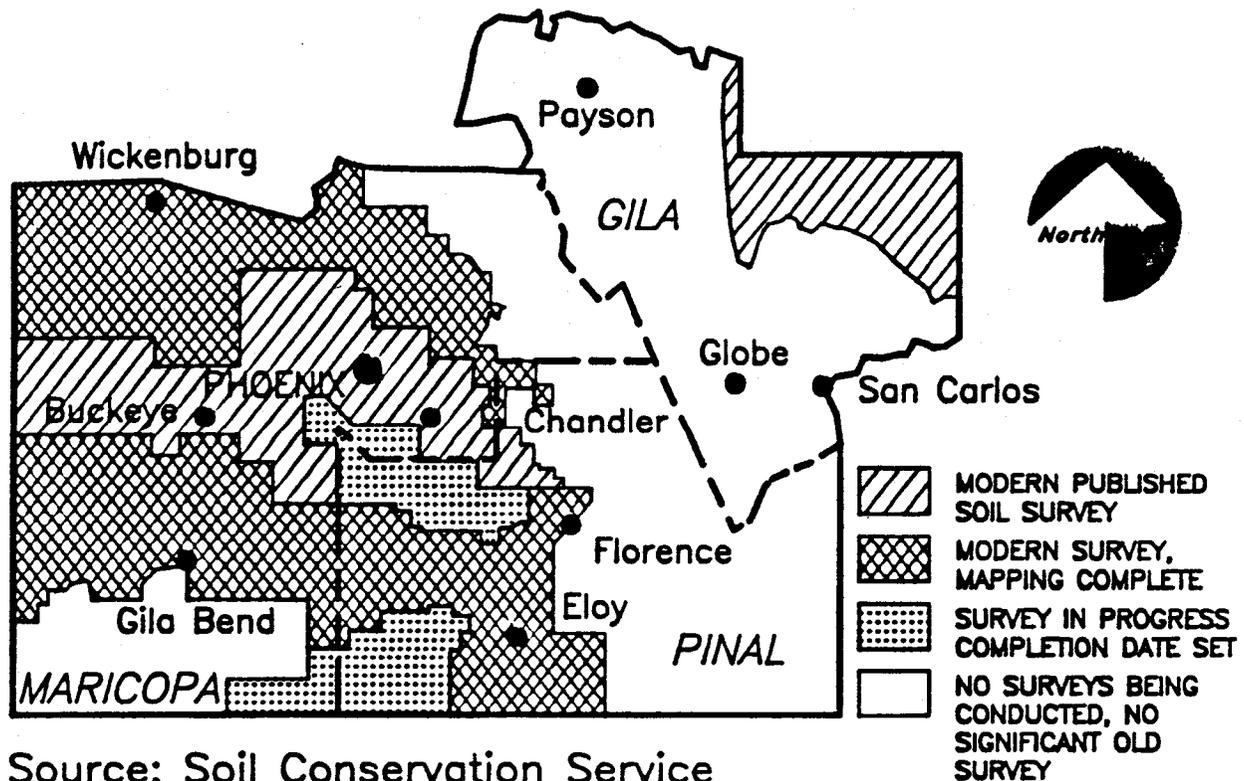


FIGURE A-1

SOIL SURVEY PROGRESS



OPPORTUNITIES

---Establish priorities for new soil surveys on the basis of resource needs.

---Increase awareness of the extent of salt- and sodium-affected soils in the area and the implications for land use considerations.

---Utilize existing soil survey information in all land use decisions.

---Consolidate existing soil surveys in Maricopa County into one document which would provide urban decision makers with state of the art soil information for urban planning needs.

---Provide a consistent resource base for developing Geographic Information Systems, Land Evaluation/Site Assessment Systems, and similar programs for use in regional planning.

---Utilize soil scientist expertise on project plans in areas lacking soil resource information.

GEOLOGY

The Hohokam RC&D Area primarily lies within the Basin and Range Physiographic Province. The exception is the north half of Gila County, which lies within the Arizona and New Mexico Mountains Physiographic Province.

Most of Maricopa and Pinal counties is characterized by broad, featureless valleys between north trending mountains. The valleys appear to be quite flat, but rise steadily from the axial trough (Gila and Santa Cruz rivers), toward the mountains. The present forms of the alternating mountains and valleys have been produced by faulting (displacement) of great blocks of the earth's crust, erosion of the uplifted mountain blocks, and deposition in the valleys of sediment derived from the mountains.

A great variety of lithologies make up the several mountain systems in the area. A major characteristic is large areas of both rocks of great age (Precambrian) and of relatively young age (late Mesozoic and Cenozoic).

The geologic history of most of the area has been largely dominated since Precambrian time by persistent "positive area" rock masses. These masses are responsible for the complex internal structure of the mountain ranges. There are large areas of metamorphic rock such as schists, gneisses, quartzites, and related rocks, and intrusive and extrusive igneous rocks, especially the types of igneous rocks termed "acidic", such as granite.

A major mountain building period began in mid-Cenozoic time. Large volumes of volcanic rocks were formed during the period. The earlier stages of volcanism, Pliocene epoch, formed such rocks as andesite. The later stages of the Pleistocene epoch were characterized by the extrusion of great quantities of "basic lava" to form basalt.

The Gila River, along with its tributaries, the Salt, Agua Fria, New River, Hassayampa, San Pedro, and Santa Cruz rivers provide drainage for most of the area.

The east and northeast part of the RC&D area includes all of Gila County and parts of Maricopa and Pinal counties. It is characterized by steep mountains interspersed with narrow, gently to strongly sloping valleys. The geology is quite varied and the numerous kinds of rock formations have exerted a strong influence on landforms and soil development.

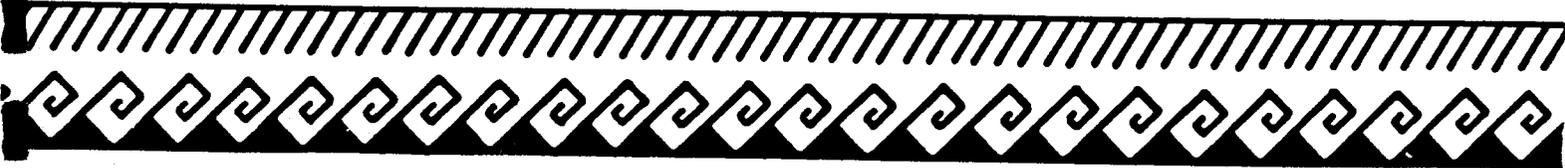
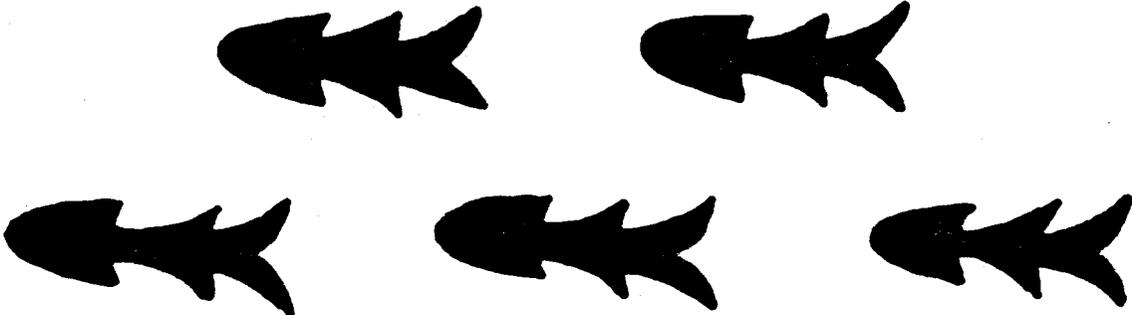
Over time, chemical and physical weathering processes produce soil. The rock type of the mountains above directly influenced the properties of soils found in the sedimentary material of the valley fill. Sedimentation and soil development in these areas is generally associated with major epochs of Pleistocene climatic conditions.

The thickness of the valley fill varies, but can range from 3,000 to 5,000 feet or more to just a few feet on the valley edge. Water contained in the coarser, more permeable valley beds is a principal ground water supply. These areas are dominated by agriculture and human habitation.

A great variety of mineral resources occur within the project area. Those that have been or are being produced include sand, gravel and crushed rock, structural clay, schist and granite for building stone, mica, diatomite, barite, kyanite, limestone, slate for flagstone and decorative uses, amethyst for gem stones, copper, gypsum, manganese, mercury, niobium-tantalum, gold, lead, silver, zinc, and beryllium.

Those that have potential for future production include tuff for building stone, refractory clay, vermiculite, lithium minerals, quartzite, strontium sulfate, halite and associated brines, feldspar, fluorospar, perlite, bentonite, thermal springs, turquoise, opal, agate, jasper, and Apache tears for gem stones, marble, molybdenum, vanadium, tin, tungsten, iron, and thorium.

WATER RESOURCES



WATER SUPPLY

The Gila and Salt rivers and their tributary streams provide most of the stored surface water supplies for the area. There are eight major impoundments on these river systems which provide water for irrigation and municipal uses in Maricopa and Pinal counties. There are numerous smaller impoundments which provide water for livestock and other local uses.

The Central Arizona Project (CAP) system delivered its first Colorado River water to Maricopa county in June, 1985. This system will provide water for numerous irrigation districts and municipalities throughout Maricopa and Pinal counties by way of an aqueduct system which will span some 200 miles when complete. Most users have yet to build their systems to accommodate CAP water deliveries.

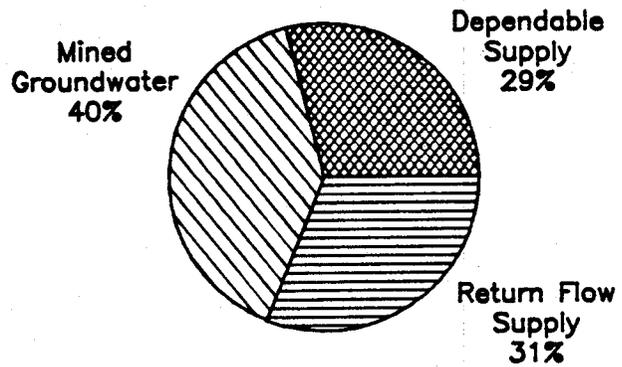
Additional major storage impoundments are also planned in conjunction with the CAP system. These include the New Waddell Dam on the Agua Fria River, Cliff Dam on the Verde River, and Buttes Dam on the Gila River, and at Roosevelt Dam on the Salt River.

Groundwater supplies are highly variable throughout the area. Well depths may range from less than 30 feet near Dudleyville to over 2,000 feet west of Coolidge. Well yields vary widely from less than 50 to over 2000 gallons per minute.

Most of Pinal and Maricopa counties are underlain by water yielding aquifers. In general, most wells are in the 200 to 500 foot range. Static water levels have been generally declining in the irrigated areas for many years.

The mountains and most of the area adjoining the Mogollon Rim in Gila County consist of hard, dense igneous rocks and consolidated sedimentary rocks which contain little space for water storage. Many fractures along the Mogollon Rim provide space for accumulations of ground water which is issued as springs. Alluvial deposits in the valleys can hold large quantities of water.

WATER SUPPLY PHOENIX AMA

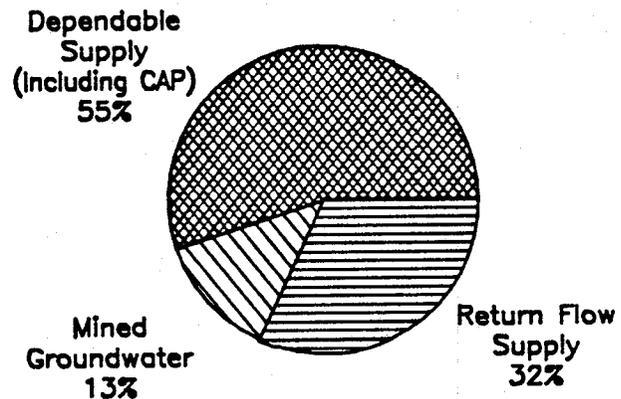


NORMALIZED 1980 CONDITIONS

Total Supply -	3.41 MAF
Dependable Supply -	.97 MAF
Return Flow Supply -	1.07 MAF
Mined Groundwater Supply -	1.37 MAF

Source: Arizona Department of Water Resources

WATER SUPPLY-2025 PHOENIX AMA



PROJECTED 2025 CONDITIONS

Total Supply -	2.76 MAF
Dependable Supply -	1.51 MAF
Return Flow Supply -	.88 MAF
Mined Groundwater Supply -	.37 MAF

Source: Arizona Department of Water Resources

Much of the water used for municipal and industrial purposes throughout the area comes from groundwater supplies. There are about 70 water supply organizations in the area, including both municipal and investor owned systems. Some of these systems are quite old and need repairs or replacement.

OPPORTUNITIES FOR ACTION

--Utilize water stored behind Painted Rock Dam.

--Support increased storage on existing dams.

--Support construction for New Waddel, Buttes, Cliff, and Box Canyon dams.

--Accelerate range improvement practices to improve watershed conditions.

--Accelerate water conservation efforts on both urban and agricultural lands.

--Encourage groundwater recharge projects where safe and feasible.

WATER USE AND DEMAND

Much of Arizona has been in a water deficit us pattern for many years. This prompted the state legislature to enact a stringent groundwater law to implement mandatory conservation and regulation measures. This law is being carried out by the state's Department of Water Resources through administrative units called active management areas (AMA). These areas are geographically based on hydrologic groundwater boundaries. The Hohokam RC&D Area includes all of the Phoenix and Pinal AMAs, and a small portion of the Tucson AMA.

In addition, the groundwater law provides for irrigation nonexpansion areas (INA) in which the drilling of new wells is restricted. The Harquahala INA is within the RC&D boundary.

Water usage within the Phoenix AMA is rapidly changing from agricultural to municipal and industrial (M&I). The population of the area is expected to double by century's end, virtually completing this transition. Water usage outside the AMA boundary in Maricopa County is principally agricultural, and will likely continue to be for the next twenty years.

The Pinal AMA includes virtually all the non-Indian irrigated lands in Pinal County. This area is projected to remain primarily agricultural, with most of the M&I growth occurring along the I-10 growth corridor from Casa Grande to Eloy.

Indian lands in Maricopa and Pinal counties have the potential to develop large acreages of new irrigated lands. Current negotiations concerning water supplies will influence how much land is actually developed for this purpose. Indian lands are not regulated by the state's groundwater control law.

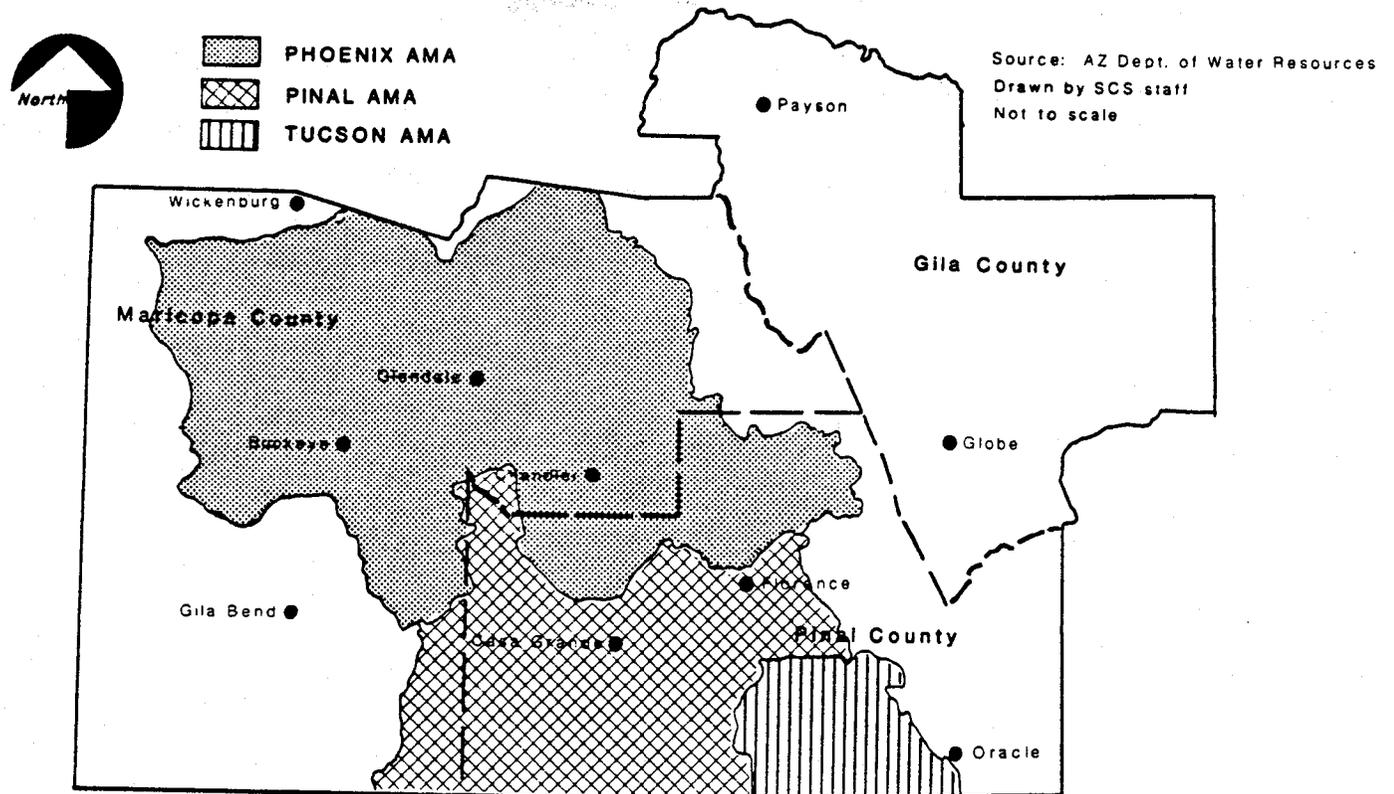
COMPARISON OF 1980 WATER USE AND POPULATION BY USER CATEGORY PHOENIX AMA

<u>User Category</u>	<u>1980 Population</u>	<u>% of Total Population</u>	<u>1980 Water Use (acre-feet)</u>	<u>Percent of Total Water Use</u>
Large Providers Low Water Users (0-140 GPCD) 1/	24,171	1.7	3,010	0.7
Medium Water Users (141-350 GPCD)	1,388,354	95.6	391,460	93.6
High Water Users (351 GPCD and above)	33,321	2.3	22,260	5.3
Small Providers	6,459	0.4	1,600	0.4
TOTAL	1,452,305	100.0	418,330	100.0

1/ GPCD = gallons per capita per day.

Source: 1980 Census and data collected from municipal providers by Arizona Department of Water Resources' staff.

GROUNDWATER ACTIVE MANAGEMENT AREAS (AMA's)



About 75 percent of the domestic water supply for Gila County is derived from groundwater sources. Most of the industrial usage in the county is related to mining activity. About 60-65 percent of the water used for irrigation is diverted from stream flows or pumped by very shallow wells (less than 30 feet) near streams. Onfarm water use is estimated at about 3.4 acre-feet per acre annually.

Present annual onfarm water usage in Pinal and Maricopa counties is estimated at about 5.5 acre-feet per acre annually. Efficiencies of application range from lows of about 35 percent to maximums of about 85 percent. Significant improvements in irrigation systems and management will be required to accomplish water conservation goals imposed by the state law.

M&I water usage rates are extremely high. The Phoenix area has one of the highest per capita water use rates in the country.

Conservation measures are mandated for this use also, and significant opportunities for improvements exist. M&I usage includes irrigation of over 50,000 acres (estimated) of turf and horticultural plantings, and maintenance of numerous urban lakes.

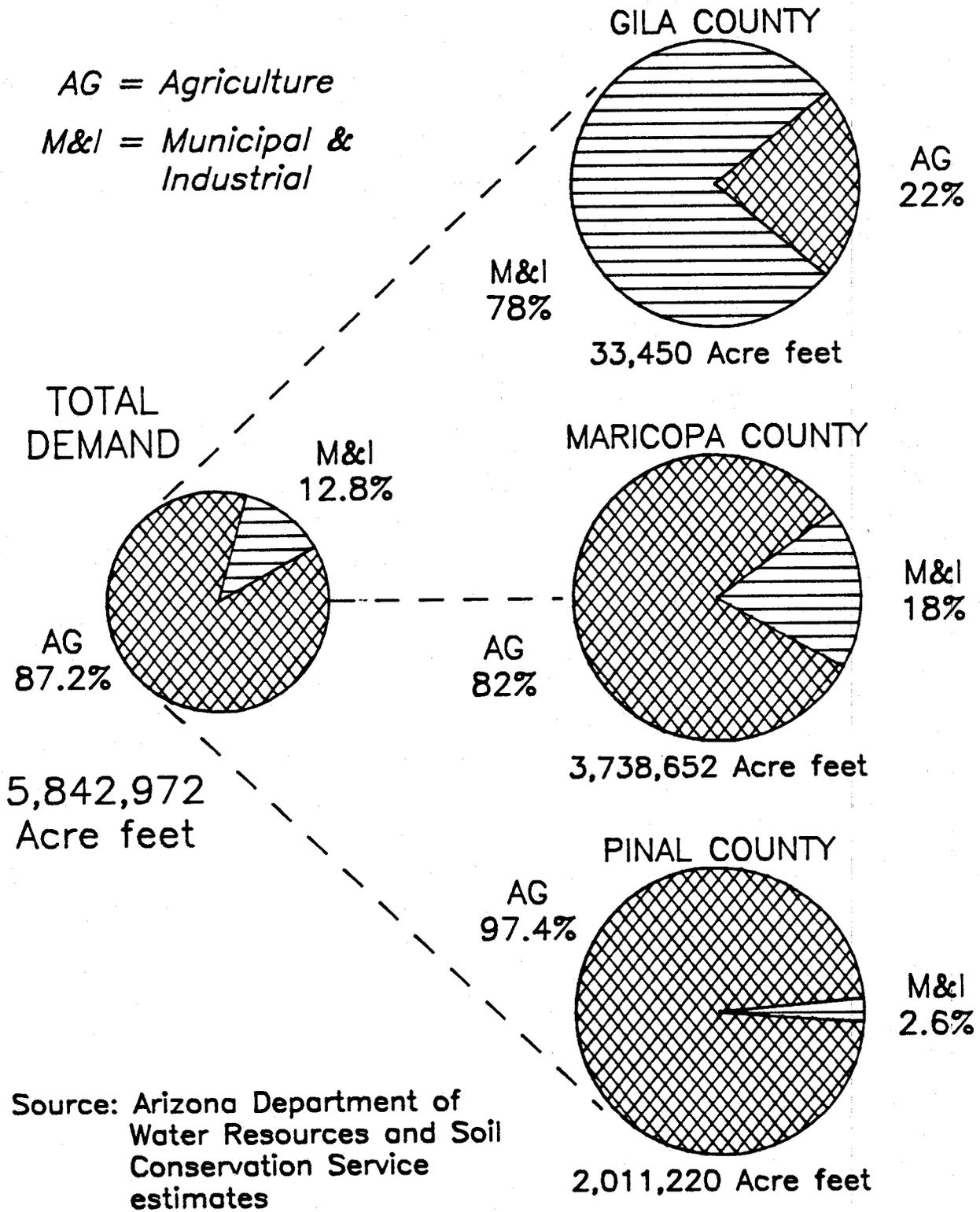
OPPORTUNITIES FOR ACTION

- Encourage water saving techniques in new home and business construction, and encourage changes to existing facilities to incorporate available technologies.
- Encourage use of low water use landscaping.
- Encourage adaptation and use of crops with lower water demands.
- Support activities and projects which increase onfarm irrigation efficiency.

PRESENT WATER DEMAND (Estimated)

AG = Agriculture

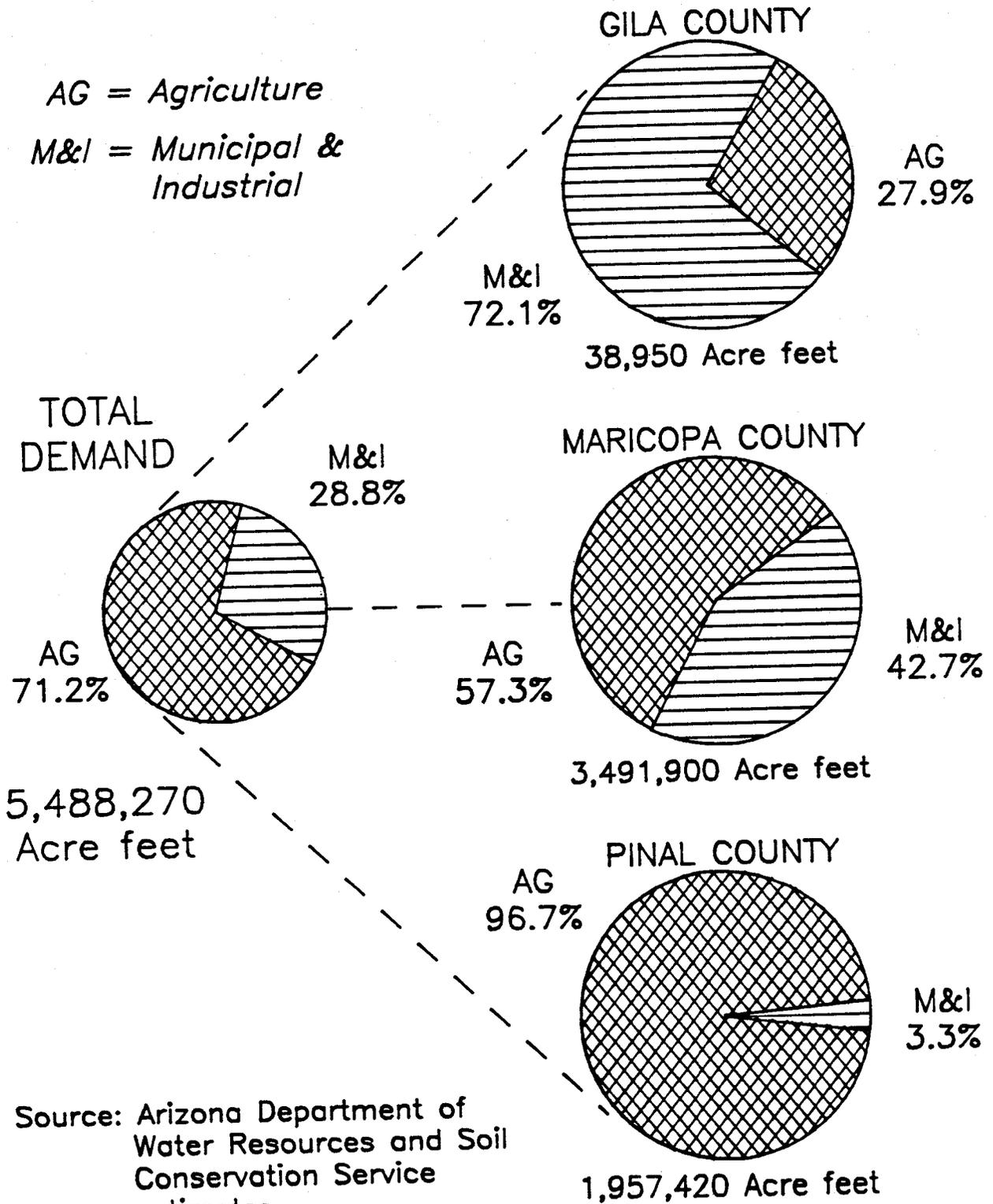
M&I = Municipal &
Industrial



Source: Arizona Department of
Water Resources and Soil
Conservation Service
estimates

FUTURE WATER DEMAND (Estimated)

AG = Agriculture
M&I = Municipal & Industrial



Source: Arizona Department of Water Resources and Soil Conservation Service estimates

WATER QUALITY

Surface water quality is variable throughout the region. Total dissolved salts (TDS) are about 700-900 ppm for the Salt and Gila rivers, and about 300-400 ppm for the Agua Fria and Verde rivers. The San Pedro River tends to have high levels of nutrients and turbidity.

Water quality problems in high-country streams such as the East Verde River, Tonto Creek and Christopher Creek, have been associated with intense recreation usage. The lower Salt River below Stewart Mountain Dam, and some of the more heavily used beaches on Saguaro Lake are also subject to recreation-related pollution.

The potential exists for surface and groundwater pollution in some areas due to increasing numbers of septic tank disposal systems. Soils in many of the mountain communities tend to be shallow and underlain by rock. This is often an inadequate filtering field.

Groundwater quality is also highly variable in the area. Most quality problems have historically resulted from high TDS and mineral content. Most waters throughout the area are suitable for irrigation. However, declining water tables have caused deterioration of quality in some areas. TDS may range from 300 to 5,000 ppm, with most sources falling in the 1,000 to 2,500 range.

Chemical contamination has become a more recognized problem in recent years. TCE has been found in numerous wells in the Phoenix metro area. Some agricultural pollutants have also been found at levels for concern.

Old landfills along the Salt River have been found to contribute toxic materials to groundwater. Efforts are being made to identify these sites and clean them up.

Additional waste-water treatment facilities are needed in several locations to meet increasing populations and to satisfy existing demands. Poor operation and maintenance, and overloaded or inadequate systems have

caused point source problems in some locations. Solid and hazardous waste disposal also constitute potential problems in degrading water quality.

Information in 208 water quality plans and the report of the Mineral Extraction Task Force carried out by the Central Arizona Council of Governments details more specific problems and needs for managing point and non-point pollution sources in the county.

OPPORTUNITIES FOR ACTION

- Support enforcement of existing regulations.
- Accelerate monitoring activities.
- Encourage use of all available resource data for planning and siting landfills.
- Support accelerated installation of community waste treatment facilities.

FLOODING AND STREAMBANK EROSION

Flood problems are widespread throughout the region. Significant flooding along the major drainages has occurred several times in recent years, beginning about 1978. Flood releases into the Salt River above Phoenix reached about 185,000 cfs, causing widespread damages to homes and businesses, roads and bridges, and farmlands. Large flood flows also occurred on the Agua Fria and Hassayampa rivers during this same period, and the combined flows into the Gila River caused unprecedented damages downstream in the Buckeye, Arlington, and Gila Bend areas. Flood waters backed up behind Painted Rock Dam to form the largest lake in the state, inundating thousands of acres of farmland.

The Santa Cruz River caused widespread damages throughout its drainage as a result of intense storms in 1983 and 1984. These flood events caused serious erosion problems as well as flooding homes and farmland.

The Gila River has flooded several times in the last six years, damaging and destroying many homes and public facilities in the towns of Winkelman, Hayden, and Kearney. Flooding along the San Pedro River damaged homes and businesses in the town of Mammoth in 1983. Farmland and rural homes along the San Pedro River and Aravaipa Creek have been flooded several times in recent years.

Flooding has occurred on American Gulch in Payson, along Tonto and Christopher creeks, along Pinal and Pinto creeks, and along Bloody Tanks Wash at Miami and Claypool. Some flooding occurs in the San Carlos area along the San Carlos River.

Local flooding occurs at many locations throughout the area. Drainage is not adequate in some areas, and local street flooding is common. Some villages on the Gila River Indian Reservation experience flooding from high intensity local storms. McClellan Wash in Pinal County floods farmlands from Picacho to Coolidge, and continues northward to cause problems on the Indian lands.

FLOOD AND EROSION CONTROL NEEDS By NRCD

<u>NRCD</u>	<u>Flood Prev. Project (#)</u>	<u>Channel Stabilization (ft)</u>	<u>Channel Clearance (ft)</u>	<u>Dikes & Levees (ft)</u>
Eloy	1	105,600	105,600	113,520
Florence/Coolidge	-	105,600	---	---
West Pinal	2	20,000	221,846	443,692
Winkelman	-	143,457	91,892	2,640
Tonto	2	26,400	26,400	---
Agua Fria-New River *	4	63,360	63,360	---
Wickenburg *	1	36,960	---	5,280
Buckeye-Roosevelt	5	52,800	105,600	---
Gila Bend	3	52,		
800	105,600	---		

Source: NRCD Long Range Programs

- Federal flood control programs have been very effective in Maricopa county, especially in the Phoenix metro area. Ongoing projects funded by the Soil Conservation Service and the Army Corps of Engineers will help protect many areas.

The Maricopa County Flood Control District is continuing to implement locally funded projects in many locations. The district is pursuing a program to develop "Area Drainage Master Studies", with 18 studies presently programmed. These studies may identify new treatment opportunities and alternatives.

Major flood control efforts in Maricopa County are now centered on elements of "Plan 6" on the Salt-Verde River system, the Rio Salado project for the Salt River from Granite Reef Dam to the Agua Fria River, and several small community flood problems.

A regional plan for flood management on the Gila-Santa Cruz drainage is needed. Buttes Dam east of Florence would ease flooding on the Gila River if built. More work is needed to assess the practicality of this structure. No other flood control features are presently planned for this drainage area.

Streambank erosion is a serious problem along most of the drainages previously mentioned. Protective stabilization measures are needed in many locations, particularly along Tonto Creek in the Tonto Basin, along the San Pedro River at Mammoth, in Star Valley near Payson, along the Hassayampa River at Wickenburg, and along the Gila River near Gila Bend. Feasible treatments may include rock rip-rap, jacks, soil cement, and vegetative plantings.

OPPORTUNITIES FOR ACTION

--Support the implementation of "Plan 6" on the Salt River system.

--Support the Rio Salado development plan.

--Utilize all available program assistance to accelerate critical area treatment projects for erosion control.

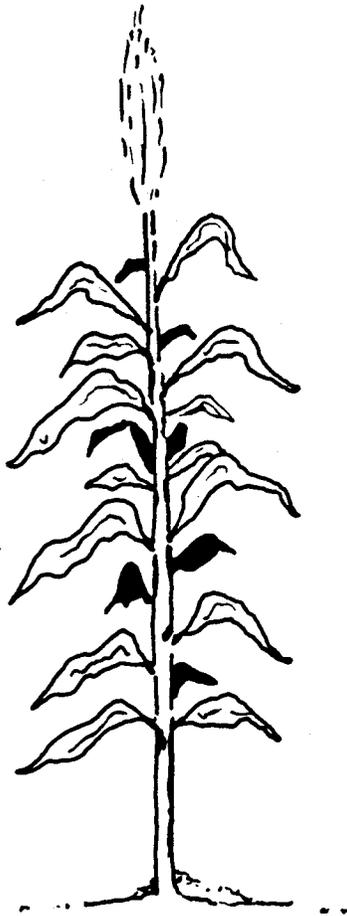
--Work with flood control districts to identify potential projects which may be eligible for financial assistance from federal and state sources.

--Support use and enforcement of flood plain regulations.

--Assist with a benefits assessment for Buttes Dam.

--Assist with the development and implementation of a regional management plan for the Gila River drainage throughout the RC&D area.

AGRICULTURAL RESOURCES



IRRIGATED AGRICULTURE

There are about 884,000 acres of irrigated cropland in the area. This is about 64% of the total cropland in the state. It is a major economic component for the area and the state.

Nearly all of this acreage is located in central and western Maricopa County and west-central Pinal County. A general decline of cropland is expected in Maricopa County, while Pinal County's acreage is expected to remain fairly stable. The greatest potential for new irrigated land development is on the Indian lands.

The number of all farms in the RC&D area is estimated at about 2200. Total cash receipts from crop marketing in 1983 were \$524,395,000, or about 57 percent of the state's total.

The area is climatically adapted to a wide variety of crops. Cotton has been and remains the principal crop produced. About one-third of the state's vegetable production is in Maricopa and Pinal counties. Forty-one percent of Arizona's citrus production is centered in Maricopa County.

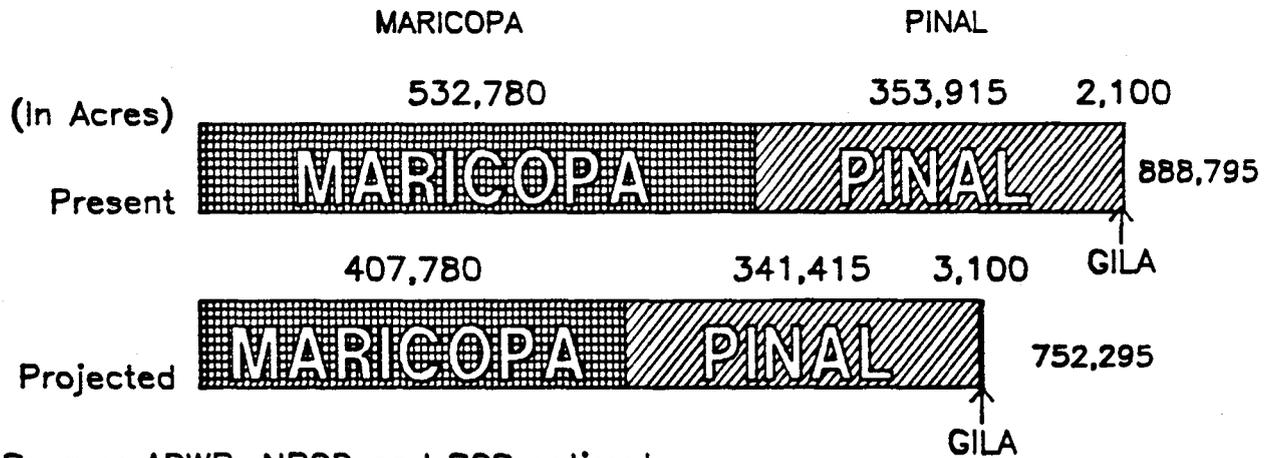
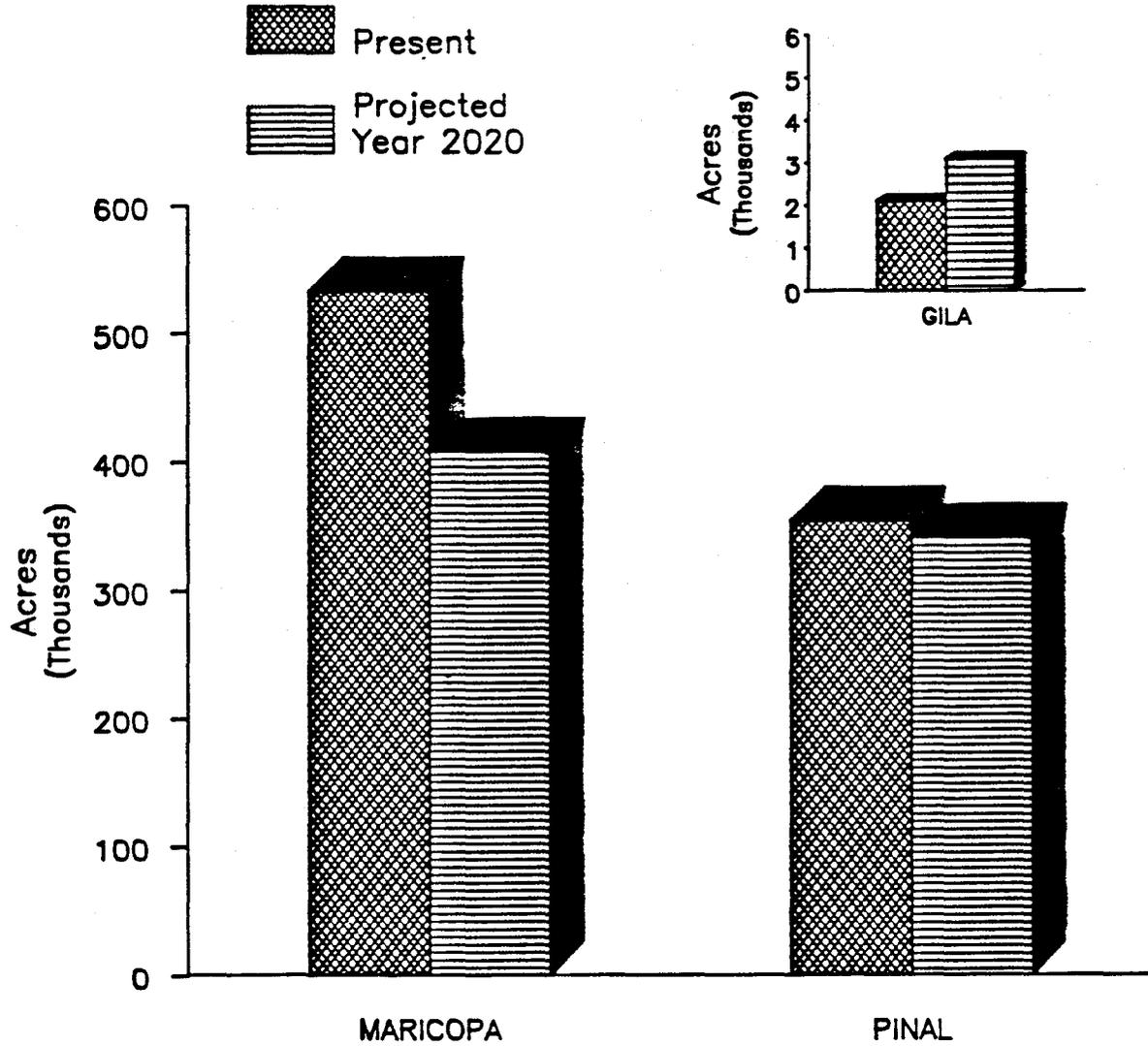
Over 60 percent of the irrigated cropland needs some form of conservation treatment, according to NRCDs long-range programs. Much of these lands need to be leveled or re-leveled to achieve acceptable irrigation efficiencies. This will also require substantial installation of water conveyances. A large need exists to improve irrigation water management and soil management.

Priorities for physical treatment should be on those lands with the greatest long-term potential to remain in agriculture. Additional financial assistance and accelerated technical assistance are needed to implement effective treatment to meet the needs of water conservation criteria.

ESTIMATED CROPLAND TREATMENT NEEDS BY NRCD

<u>NRCD</u>	<u>Land Leveling</u> (Ac)	<u>Water Conveyance</u> (MI)	<u>Irrigation Water Mgmt.</u> (Ac)	<u>Soil Management</u> (Ac)
West Pinal	121,072	644	121,072	82,138
Florence/Coolidge	53,790	633	53,790	2,000
Eloy	93,362	398	78,542	57,042
Tonto	300	3	200	100
Gila Bend	48,972	658	54,000	54,000
Buckeye-Roosevelt	105,820	1,173	109,571	109,571
Wickenburg	12,000	53	24,000	24,000
East Maricopa	49,121	119	60,453	17,900
Agua Fria-New River	69,000	442	97,000	97,000
Area Total	553,437	4,123	598,628	443,751

IRRIGATED CROPLAND (Acres)



Source: ADWR, NRCD and SCS estimates

The tremendous urbanization pressures in Maricopa County, and to a lesser extent in Pinal County, have maintained farmland values at prices far above national averages. These lands are very attractive to investors and speculators, and they are subject to increasingly frequent changes in ownership. This may be an impediment to conservation treatment since the farmer is often a leasing tenant and the owner is not willing to finance farm improvements having long-term economic returns.

Insects, disease, and weeds limit or reduce crop yields and quality in some areas. The relatively recent arrival of the cotton boll weevil and continuing infestations of pink bollworm plague the cotton industry. Noxious weeds are a particular problem in parts of the San Carlos Irrigation District in Pinal County. High winds cause plant damages in some areas.

Farmers near urbanizing areas are particularly hard pressed to carry on normal farm operations and pest control without incurring the wrath of their new neighbors. This is causing increasing changes in cropping patterns. Production of crops with high potential pest control needs is migrating away from metropolitan areas.

LIVESTOCK PRODUCTION

Livestock and livestock products were worth about \$427 million in 1983. Maricopa and Pinal counties account for about two-thirds of the cattle on feed in the state. The combined outshipment of cattle and calves for the area in 1984 was nearly a quarter-million head.

About 150 dairies are located in the area, with most within fifty miles of Phoenix. Arizona exports milk to surrounding states, and is ranked fourth nationally in milk produced per cow (annual average 14,723#). Many dairies have relocated in recent years due to urban encroachment.

Sheep and lamb production has steadily declined since the mid 1970's, primarily due to poor prices. Other influences include urbanization, increased double cropping on grazing lands, and losses to predators.

Maricopa and Pinal counties produced about 14 percent of the state's hogs and pigs in 1984. Poultry production has remained fairly stable.

There is some experimentation with Angora goats on rangelands. This enterprise appears to be economically viable, and provides an extra benefit by helping to control undesirable brush species.

OPPORTUNITIES FOR ACTION

----Support efforts to minimize losses of cropland to competing land uses.

----Assist with planning for new cropland developments to encourage efficient water use.

----Support research and testing to find economically viable, low water using cash crops.

----Support programs to accelerate onfarm conservation treatment.

----Assist with group projects which enhance agricultural stability.

----Assist with formation of special purpose organizations, such as weed control districts, where appropriate.

ACREAGE HARVESTED BY COUNTIES, AND TOTAL STATE PRODUCTION, ARIZONA 1984
PRINCIPAL CROPS

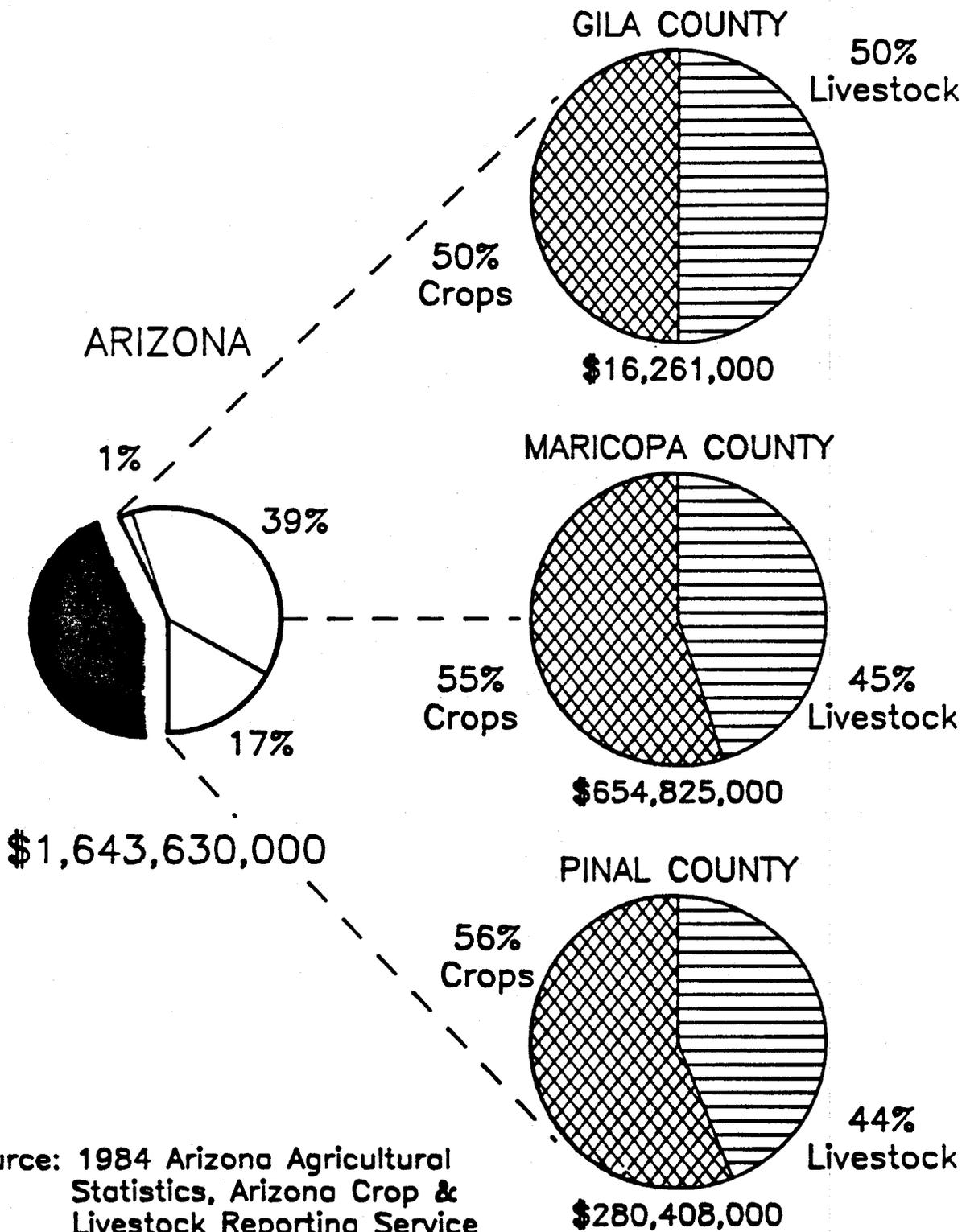
Crop	State Total	Gila	Maricopa	Pinal
Upland Cotton: Acres	429,000	0	185,300	120,200
Bales, 480 lb. net wt.	1,097,000			
American Pima Cotton: Acres	50,300	0	13,800	16,950
Bales, 480 lb. net wt.	88,100			
Alfalfa: Acres	150,000	200	46,000	13,000
Production, tons	1,080,000			
Other hay: Acres	25,000	*	7,000	1,800
Production, tons	100,000			
Durum wheat: Acres	80,000	*	30,800	29,300
Production, tons	216,000			
Other wheat: Acres	62,000	*	18,500	4,100
Production, tons	167,400			
Barley: Acres	53,000	*	18,300	20,600
Production, tons	128,470			
Corn for Grain: Acres	26,000	*	2,300	500
Production, tons	101,920			
Sorghum for Grain: Acres	16,000	*	4,500	3,100
Production, tons	38,080			
Potatoes: Acres	5,400	0	4,960	0
Production, cwt.	1,647,000			
Principal vegetables:				
Acres	63,750	0	16,850	3,150
Production, cwt.	15,063,000			
Grapes: Acres	4,371	0	*	*
Production, tons	14,000			
All citrus: Acres	41,200	0	16,700	*
Production, ctns.	17,700,000			
Total acres harvested ^{1/}	1,072,227			

^{1/} Includes multiple crop acreage.

* Acres harvested too small to warrant quantitative estimate. Acres, if any, are included in State totals.

Source: Arizona Agricultural Statistics, 1984
Arizona Crop and Livestock Reporting Service

TOTAL CASH RECEIPTS FROM AGRICULTURAL MARKETINGS—1983



Source: 1984 Arizona Agricultural Statistics, Arizona Crop & Livestock Reporting Service

RANGELAND

There are approximately 10.6 million acres of rangelands in the RC&D Area. These lands furnish grazing for livestock as well as providing habitat for diverse wildlife. They are important watershed areas for a large percentage of Arizona's population, and they provide considerable recreational and aesthetic values.

Unrestricted use in the early grazing history caused a significant reduction of perennial forage species. This in turn led to present day problems of decreased economic forage and increased erosion.

Poor grazing practices generally prevent the recovery of the more palatable perennial grasses, forbs, and shrubs. Vegetative cover is not sufficient to prevent erosion in many areas. This has an adverse impact on the quality and quantity of runoff waters in the watersheds.

Great variability in the supply of livestock forage from year to year causes extreme fluctuations in the livestock industry. Since most of the major forage species are annuals, good production only occurs on an average of about one in five or six years. This makes intensive management difficult to achieve. Many ranches only provide a subsistence income to the operators, leaving little room for grazing fee increases or other uncontrollable costs. There is a moderate rate of ranch ownership changes and absentee ownership which makes long term management improvement difficult.

There is a lack of soil survey data in some areas to do an adequate job of range resource planning. There is a lack of resource data for planning on most Indian lands.

Recreation demand often conflicts with the control and management of livestock. Off-road vehicle use causes severe damage to vegetation and increases soil erosion. Vandalism is a significant and growing problem in all areas.

The wide variation in plant communities growing on range and woodlands is the result of extreme and abrupt changes in climate, soil, elevation, and past usage. These communities can be placed in the following Major Land Resource (MLRA) Classifications (see MLRA map for boundary delineations):

MAJOR LAND RESOURCE AREAS DESCRIPTIONS

MLRA 30-1 and 40-2: This area is characterized by very low precipitation (3-8 inches), one rainy season a year (spring), very long growing seasons, desert shrub plant communities, and very high summertime temperatures.

Large land areas are required to make an economic ranch unit in this region. Ranches are commonly 50,000 to 100,000 acres in size. Carrying capacities are very low, ranging from 2 to 5 cows per section per year. Physical improvements are difficult to justify economically. Many ranches bring in additional stock in the spring season to fully utilize the growth of annual forbs and grasses. This brings about excessive grazing pressure when rainfall is less than average.

Gully erosion is severe in bottomlands in this entire area. Livestock tend to overutilize these areas. Wind erosion of the sand upland areas is a problem in isolated areas. Cost effective methods for treating these erosion problems have not been determined.

MLRA 40-1 AND 40-3: This region is characterized by low precipitation (10 inches), both a spring and a summer rainy season, very long growing seasons, desert shrub and tree plant communities with understories of perinneal grasses and forbs, and very high summer temperatures.

Large land areas are required to make an economic ranch unit. Ranches are commonly 30,000 to 50,000 acres in size. Carrying capacities range from 4 to 8 cows per

section. Grazing practices commonly hinder effective range management by applying large increases in grazing pressure during the critical spring and summer growing seasons. Facilities needed to implement grazing management systems may be hard to justify economically.

Moderate erosion problems are present on most of the upland range sites, and severe on all of the bottom range sites. Perennial grasses and forbs have largely been replaced by unpalatable shrubs and by increases in woody species like palo verde, mesquite, catclaw, and whitethorn. Brush encroachment is a serious problem on most range sites. New methods and materials for brush control need to be tried and evaluated in this area.

MLRA 41-3, 41-1, and 39-4: This region is characterized by moderate precipitation (14 inches), both a spring and summer rainy season, medium length growing seasons, moderate temperatures, and plant communities which are potentially grasslands.

Ranches are generally smaller than the other two areas, and more productive. They range in size from 5,000 to 30,000 acres, with carrying capacities ranging from 8 to 15 cows per section.

Erosion problems are moderate to severe on the upland range sites, and very severe on the bottom range sites. It is estimated that only about 20 percent of the ranches practice an effective grazing system. Brush encroachment is a major obstacle to implementing more grazing systems.

Additional rangeland information is contained in the Bureau of Land Management's Environmental Impact Statements which have been published for the Lower Gila South, Lower Gila North, and Skull Valley/Black Canyon areas. Soil Surveys published by the Soil Conservation Service contain additional information about range sites (see soils section).

The Tonto National Forest covers over two and one-half million acres in the RC&D area. Most timber harvesting occurs on the forest lands in northern Gila County. There are about 109,492 acres suitable for timber harvesting.

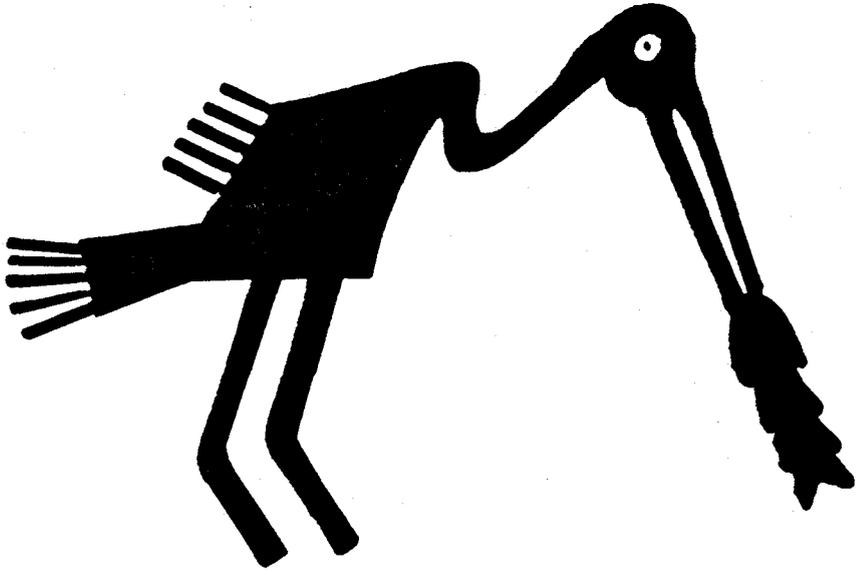
Most suitable areas have been harvested twice, with nearly all the old growth timber removed. Current harvest levels may be exceeding the area's productive capability. Also, emphasis on other resource uses may reduce the amount of timber available.

The forest is an important source of firewood. Cutting firewood for the Phoenix metropolitan market has become a sizeable commercial enterprise in recent years. Many homeowners cut and haul their own firewood, combining the activity with outdoor recreation. The demand for fuelwood exceeds the supply, and cutting must be closely managed. An inventory of fuelwood resources is needed.

OPPORTUNITIES FOR ACTION

- Develop planned grazing programs in those areas where there is a potential for increasing the production of desirable perennial forage species.
- Develop appropriate and effective brush management/manipulation techniques.
- Accelerate research on prescribed burning techniques for various locations throughout the RC&D area.
- Explore formation of prescribed burning districts to share in the use of rural fire departments' equipment.
- Carry out a study of ranching economics in eastern Pinal County (Winkelman NRCD).
- Increase the cost-sharing assistance available for range improvement practices.
- Determine how much use the various vegetative areas can tolerate without deteriorating.
- Establish areas for off-road vehicle users where erosion hazards are slight.
- Explore legislation to control use of off-road vehicles in environmentally sensitive areas.
- Reduce vandalism by promoting programs that bring public attention to the problem, and support law enforcement efforts in prosecuting offenders.
- Support changes in any agency policies which may presently have an adverse impact on range resources.

FISH & WILDLIFE RESOURCES



FISH AND WILDLIFE

Fish and wildlife are a valuable resource and should be conserved and developed as are other resources. Technical and financial assistance is needed to help carry out improvement programs.

"Wildlife", as used here, refers to all animals, with the exception of domesticated livestock, whether managed or escaped to the wild. Wildlife, in this sense, includes such diverse forms as fish, birds, lizards, deer, insects, and soil microorganisms.

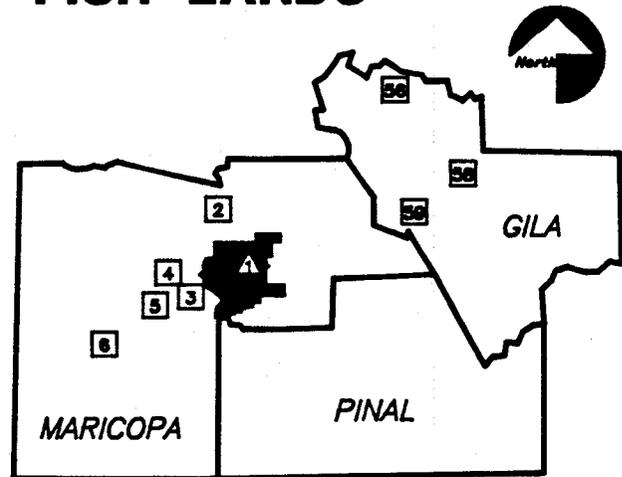
There is a wide diversity of habitat in the project area. There are several man-made lakes, numerous mountain streams, mountain ranges, desert-urban landscapes, relic rivers, forested high country, and rural farming areas.

The area includes very important nesting and roosting habitat for the white-winged dove, one of the most important hunting resources in the state. Mesquite thickets and salt cedar thickets along the Salt and Gila rivers are the major vegetative types used by these doves. This habitat has been disappearing steadily since 1955, and water development projects continue to threaten some of the remaining prime habitat areas. The three major remaining areas are the Komatke thicket, Gillespie Dam to Painted Rock Dam, and Gillespie Dam to the confluence of the Salt and Gila rivers.

Marsh birds and waterfowl utilize the ponds fed by effluent from the Phoenix sewage treatment plant. Some of this habitat may be affected when the Palo Verde nuclear power generating plant goes online and utilizes its maximum amount of this water.

The unprecedented growth of the Phoenix metropolitan area has been steadily reducing the rural farm and native desert habitat adjoining the cities in the Salt River Valley. The impact of recreationists on open lands near the cities has become increasingly severe. Off-road vehicles such as motorcycles and ATC's are extremely popular. This type of activity is difficult to quantify, but it does impact wildlife by disturbing nesting sites and destroying habitat.

ARIZONA GAME & FISH LANDS



Source: Arizona Outdoor Recreation Coordinating Commission

1 -- PHOENIX HEADQUARTERS SITE, 10 ac.

2 -- BLACK CANYON SHOOTING RANGE, 1290 ac.

3 -- BASE & MERIDIAN WILDLIFE HABITAT, 173 ac.

4 -- GILA RIVER LANDS WILDLIFE AREA, 6896 ac.

5 -- GILA RIVER LANDS (WILDLIFE HABITAT), 1836 ac.

6 -- PAINTED ROCK WILDLIFE AREA, 6164 ac.

56 -- TONTO FISH HATCHERY, 20 ac.

58 -- CUNNINGHAM LANDS (WILDLIFE HABITAT), 63 ac.

59 -- THREE-BAR WILDLIFE AREA, 38,897 ac.

Source: Arizona Outdoor Recreation Coordinating Commission

Threatened and endangered species need constant protection. Many species of wildlife are unique to the project area and are found no other place in the world. Most of these are lizards, toads, geckoes, and small mammals. These are important to the quality of the environment and the quality of life in the area.

Water is a limiting factor for many game animals and birds. All game animals in the area require permanent water as do most of the nongame species. Development of water is necessary if populations of species are to be increased. Consideration should be given to improving water supplies for certain species and for utilizing waters which may become available through project type activities.

Fisheries management problems in the area are nominal. The most serious problem is the lack of water and increasing demands for it. The Central Arizona Project may ease some of this pressure. Potential problems exist where pollution of trout waters may occur from septic tank disposal fields in developing recreation areas.

A primary concern in fisheries management is for the native fish species, which have little economic value but are part of the unique fauna of Arizona. These fish have very specific requirements as to locations and associated aquatic biota. They are in danger of extinction from loss of habitat or introduction of hardier fish that suppress the natives by competition or hybridization. Planning consideration should be given to fish species, especially as the metropolitan area grows and demands for water-based recreation increase.

With rapidly increasing human populations projected well into the next century, the pressures placed on existing wildlife habitats will increase many fold. If hunting and fishing are to continue, plans must be made to intensify habitat management and increase land acquisitions.

Planning and zoning decisions should reflect the economic impact of hunting and fishing, and give consideration to the aesthetic and environmental values of all wildlife. There is a need for better interagency coordination to implement existing agency plans for wildlife habitat preservation and management.

OPPORTUNITIES FOR ACTION

----Coordinate wildlife needs with present interagency projects. The effects of projects on wildlife should be fully mitigated where appropriate.

----Encourage developers to plan for and develop wildlife habitat in stormwater detention basins.

----Develop additional primary-use wildlife habitat areas in locations having long-term potential for sustained production, especially riparian areas.

----Encourage NRCD's to evaluate wildlife habitat needs as part of long range programming.

----Encourage development of an aquaculture association for promotion, marketing, and production techniques.

----Encourage development of trespass hunting facilities.

----Encourage a survey of all biotic communities with recommendations for the preservation and enhancement of all wildlife habitat.

----Encourage a survey of all potential wetland, marsh land, or open water developments.

----Assist agencies in developing watering facilities for wildlife, where needed.

WILDLIFE OCCURRENCE

Mammals

1. Beaver -----	Uncommon	12. Ariz. gray squirrel ---	Common
2. Javelina -----	Common	13. Raccoon -----	Common
3. White-tailed deer -----	Common	14. Ringtail -----	Common
4. Desert mule deer -----	Common	15. Coati -----	Uncommon
5. Mountain lion -----	Uncommon	16. Badger -----	Common
6. Bobcat -----	Common	17. Skunks -----	Common
7. Coyote -----	Common	18. Cottontail rabbit ----	Common
8. Gray fox -----	Common	19. Jack rabbit -----	Common
9. Kit fox -----	Uncommon	20. Porcupine -----	Common
10. Black bear -----	Common	21. Desert bighorn sheep --	Uncommon
11. Abert's squirrel -----	Common	22. Elk -----	Common

There are many species of rats, mice, gophers, bats, ground squirrels, and chipmunks in the project area.

Birds

- | | |
|-----------------------|---|
| 1. White-winged dove | 8. Mearns' quail |
| 2. Inca dove | 9. Several birds of prey |
| 3. Mourning dove | 10. Numerous shore, wading, and marsh birds |
| 4. Gambel's quail | 11. Robin |
| 5. Blackbird | 12. Waterfowl |
| 6. Starlings | 13. A host of perching birds |
| 7. Band-tailed pigeon | |

Fish

- | | |
|--------------------|--|
| 1. Largemouth bass | 6. Bluegill |
| 2. Smallmouth bass | 7. Catfish |
| 3. White bass | 8. Trout |
| 4. Yellow bass | 9. Carp |
| 5. Crappie | 10. Tilapia and numerous other species of fish |

Reptiles and Amphibians

There are approximately 29 species of lizards, 29 species of snakes, 15 species of toads and frogs, and one species of salamander. There are several ranges of animals that overlap into the project area, so that specific species counts are difficult to make.

THREATENED AND ENDANGERED SPECIES

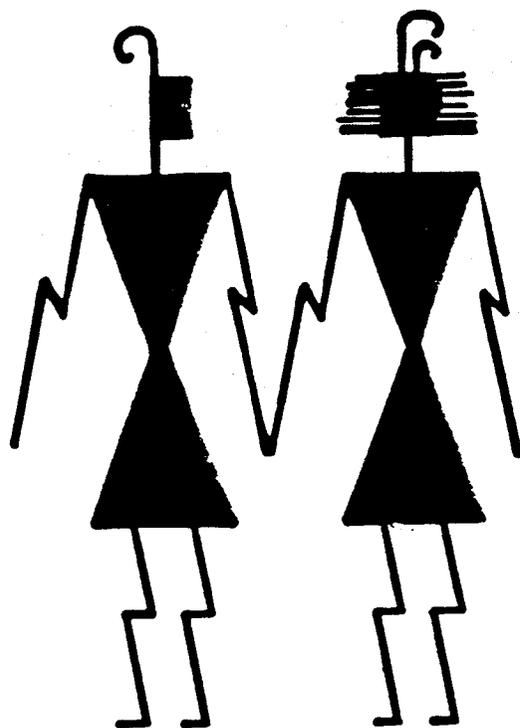
The project area has several threatened and endangered species of wildlife. There are several known species of fish and some that may be found in several springs and flowing water areas.

- | | | |
|-----|------------------------------|--|
| 1. | Gila top minnow ----- | Found in the Lake Pleasant drainage, Boyce-Thompson Arboretum, and other spots. |
| 2. | Wound fin dace ----- | Hassayampa River drainage near Wickenburg, Salt River below Stewart Mt. Dam. |
| 3. | Western speckled dace ----- | Seven Springs Wash. |
| 4. | Gila intermedia (Chub) ----- | Seven Springs Wash. |
| 5. | Yuma clapper rail ----- | Gila River southwest of Phoenix. |
| 6. | Prairie falcon ----- | Entire area. |
| 7. | Peregrine falcon ----- | Entire area. |
| 8. | Bald eagle ----- | Riparian zones on Verde River. |
| 9. | Osprey ----- | Riparian zones on Verde River. |
| 10. | Gray hawk ----- | North-northeast areas. |
| 11. | Black hawk ----- | North-northeast areas. |
| 12. | Marsh birds ----- | Breeding in Gila drainage and dependent on marshy areas along Gila River northwest of Phoenix. |
-
- | | |
|-----------------------------|---------------------|
| a) Blackcrowned night heron | d) Least bittern |
| b) Yellow throat | e) Great blue heron |
| c) Long billed marsh wren | |

The following may be in the project area:

- | | | |
|----|-------------------------|--------------------|
| 1. | Squaw fish ----- | Salt River |
| 2. | Gila cypha (Chub) ----- | Salt River |
| 3. | Gila elegans ----- | Salt River |
| 4. | Loach minnow ----- | Seven Springs Wash |
| 5. | Spike dace ----- | Verde River |

SOCIO-ECONOMIC RESOURCES



PEOPLE AND THE ECONOMY

The RC&D area has one of the fastest growing populations in the nation. It is marked by wide diversities in distribution and lifestyles.

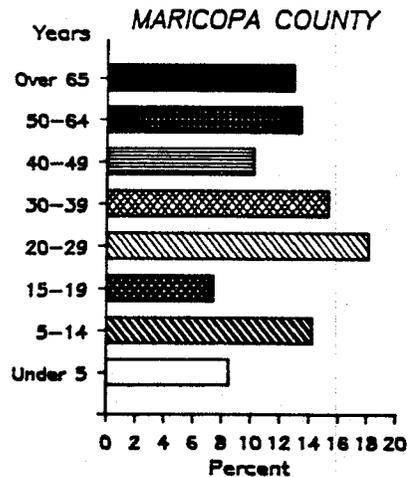
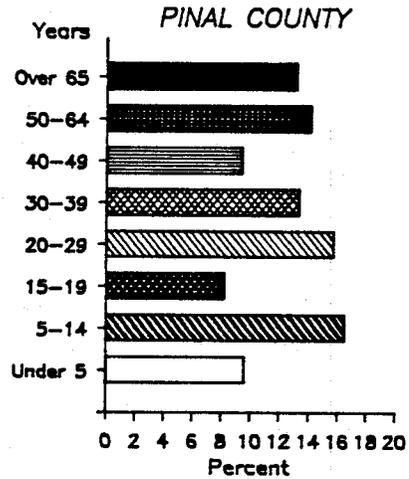
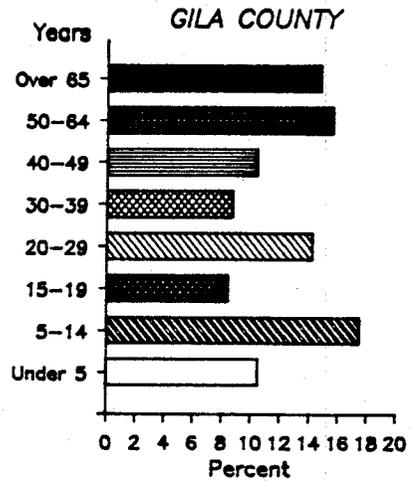
The burgeoning Phoenix metropolitan area is the center of population for the state. The area has rapidly evolved from a farming and agri-business center into a manufacturing, service, and financial center for much of the southwest. The lifestyle is heavily oriented to high-tech jobs and fast paced city activities. East Mesa, Apache Junction, and Sun City are significant retirement and winter visitor meccas, with lifestyles radically different from their neighbors.

The smaller, agriculture-based communities in Maricopa and Pinal counties offer a slower pace of life. The economics are heavily intertwined with the farm industry. There is a trend for manufacturers to locate facilities in some of these locations to take advantage of lower land costs and less competitive labor pools.

The "mountain" communities of Gila County and eastern Pinal County are dependent on tourism and mining. Northern Gila County's economy is mostly recreation oriented, with ranching and some lumbering activity. Southern Gila and eastern Pinal counties are almost exclusively mining oriented. The communities grew up around the mining industry, particularly the copper industry. The depressed world copper market of the past few years has severely impacted these communities. Ranching and mostly ranch-related farming also contribute to the local economy.

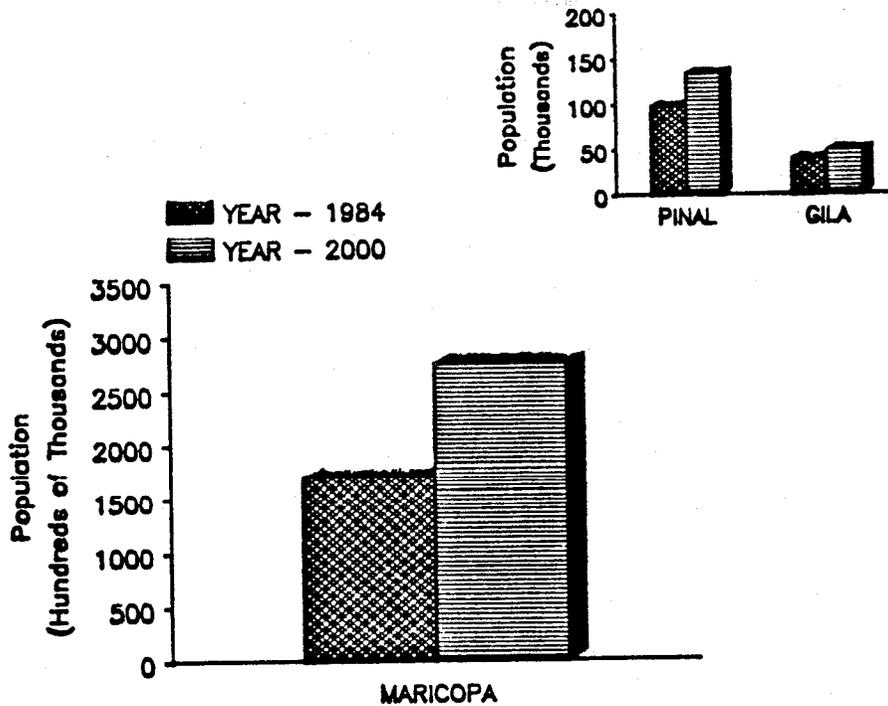
The state's Department of Commerce is carrying out a regional economic evaluation of the "Copper Basin" area to help find ways of stabilizing and diversifying the economy. The Central Arizona Association of Governments (CAAG), which includes Gila and Pinal counties, has requested designation as an Economic Development District from the Economic Development Administration. This action, if approved, should aid economic planning in the area and provide additional funding for project activities.

AGE DISTRIBUTION BY COUNTY (%)



Source: Arizona Statistical Review, 1984, VNB

PRESENT AND PROJECTED POPULATIONS



Source: Arizona Statistical Review, VNB, 1984

Northern Gila County communities will continue to grow, subject to the availability of developable land. Populations in southern Gila and eastern Pinal counties may decline slightly if mining activities continue present downward trends. Communities in this area may eventually realize modest growth as their attractiveness as retirement centers become known. New industries and/or upturns in the copper industry could lead to some growth.

The fifteen municipalities within the Phoenix metropolitan planning area have a combined population of well over 1.5 million. This population is expected to reach four million by the year 2010.

Population increases are predicted along the Interstate 10 corridor in Pinal County. Growth areas include Casa Grande, Eloy, and Arizona City.

Opportunities for Action

- Utilize all available resource data to plan for orderly population growth.
- Assist "Copper Basin" communities to diversify their industrial base.
- Assist state, regional, and local agencies with regional development plans.

POPULATION DENSITY (Persons per square mile)

Gila	8.3
Maricopa	188.0
Pinal	18.4

RACIAL PROFILE (1981)
Percent of Total

<u>County</u>	<u>White</u>	<u>Indian</u>	<u>Black</u>	<u>Oriental</u>	<u>Other</u>	<u>Spanish Heritage</u>
Gila	81.3	13.7	0.2	0.2	4.5	20.8
Maricopa	86.6	1.5	3.2	0.9	7.8	13.2
Pinal	68.0	9.3	3.3	0.3	19.0	29.4

Source: U.S. Department of Commerce, Bureau of the Census

EMPLOYMENT (1984)

<u>County</u>	<u>Total Labor Force</u>	<u>Total Employed</u>	<u>Percent Unemployed</u>
Gila	13,675	12,150	11.1
Maricopa	880,100	845,800	3.9
Pinal	28,725	25,575	10.4

Source: Arizona Department of Economic Security

BUILDING PERMIT VALUES BY COUNTY (1984)

Gila	\$13,902,000
Maricopa	\$2,469,760,000
Pinal	\$69,348,130
Total	\$2,553,010,130

Source: Bureau of Business and Economics Research, Arizona State University

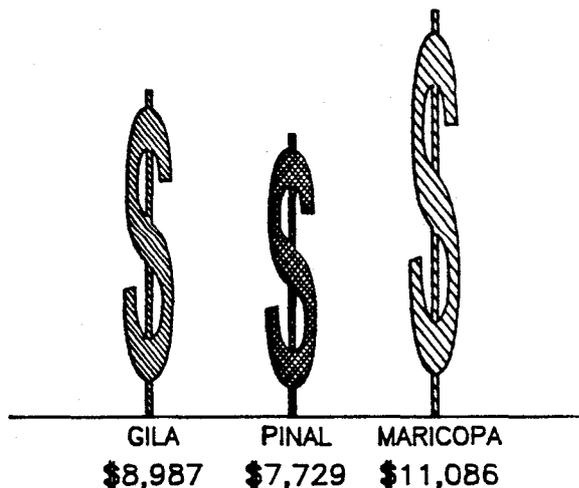
BUSINESS ESTABLISHMENTS BY INDUSTRY, 1982

<u>County</u>	<u>Ag. & Forest</u>	<u>Mining</u>	<u>Const.</u>	<u>Mfg.</u>	<u>Trans. & Utilities</u>	<u>Wholesale</u>	<u>Retail</u>	<u>RE & Finance</u>	<u>Service</u>	<u>Other</u>
Gila	5	14	48	21	19	29	227	47	173	19
Maricopa	556	80	3,241	2,101	800	2,964	8,492	3,538	11,628	936
Pinal	37	16	78	52	45	71	439	79	309	24

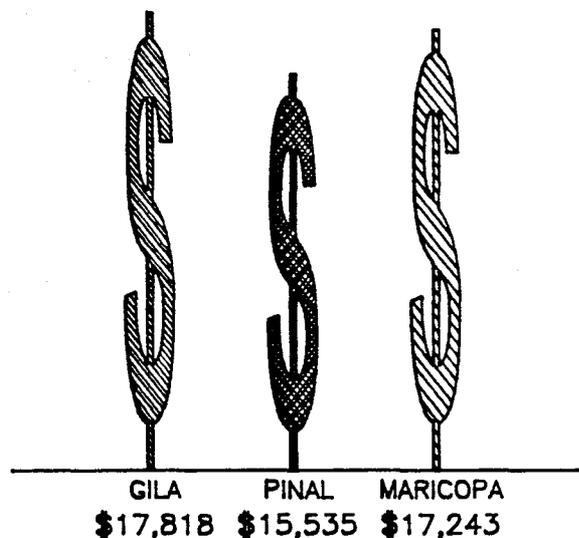
Source: U.S. Department of Commerce, Bureau of the Census.

1983 INCOME & WAGES (\$)

PER CAPITA INCOME



AVERAGE ANNUAL WAGES



Source: Arizona Statistical Review, 1984, VNB

BUSINESS AND INDUSTRY

The outlook for business and industry for the area in general is extremely favorable. The strong economy of the Phoenix metropolitan area creates numerous spinoff benefits for adjoining areas.

The advent of high-tech electronics manufacturing industries in the Phoenix area has brought on an accelerated growth in the manufacturing sector. These industries find a large, relatively young, and skilled workforce combined with ideal climatic conditions which make the central Arizona area very favorable for continued growth.

Phoenix is also a major financial and corporate center for the southwest. Many major companies have located their national corporate headquarters here in recent years, and indications are that this trend will continue. Many large banks and savings and loan institutions are located in Phoenix, making it the financial hub for the state and much of the region.

Those communities whose industrial base is centered on copper mining have not fared so well. World copper prices have been poor for several years, forcing the closure of several mines, and scaled down production in others. Existing businesses in communities like Superior, Hayden, Kearney, and Winkelman have been depressed along with the copper industry. There is a significant need in these communities to find ways of diversifying the local economy to decrease the dependence on mining activities.

The business outlook in the recreational communities of northern Gila County is very bright. These communities can look forward to continuing demands for goods and services as the nearby population surrounding Phoenix mushrooms. There is a need to develop more opportunities for destination tourism. Facilities for large conferences and small conventions are needed.

The Pinal County growth corridor along Interstate 10 has strong potential for industrial development. Several large facilities have recently located in the Casa Grande area, and this trend is predicted to continue.

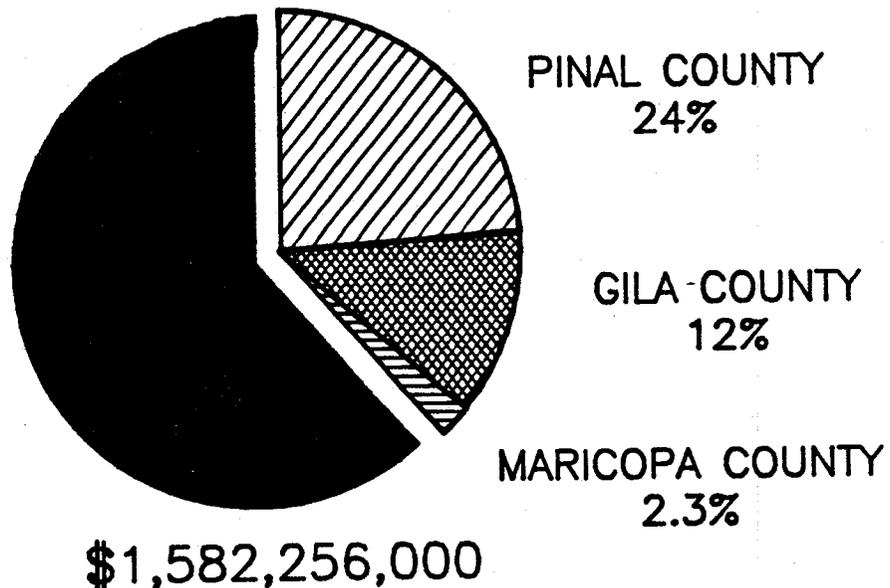
Industrial parks are needed on Indian reservations and in other rural areas to expand employment bases. The Gila River Indian Community is making progress in this regard, with two parks in operation. The San Carlos tribe and the Papago tribe need these types of development.

OPPORTUNITIES FOR ACTION

- Encourage development of properly designed industrial parks.
- Work toward improved transportation systems in rural communities.
- Emphasize "clean" businesses which generate little or no air and water polluting materials.
- Assist rural communities to identify and establish new businesses and industries.
- Assist rural communities to identify and develop tourism and recreational facilities.

VALUE OF MINERAL PRODUCTION—1982

ARIZONA



Source: U.S. Department of Interior, Bureau of Mines

COMMUNICATIONS AND TRANSPORTATION

The communications network in the RC&D area is highly developed. Most of the area has access to major radio, television, and print media which originate in Phoenix or Tucson. Many of the more remote areas are serviced by cable or local relay systems to enable reception of radio and television.

The advent of satellite communications has opened up another way for remote rural residents to tap into a virtual worldwide communications network. Those who can afford a satellite TV dish receiver can easily tap into this medium.

The focus of the major communications mediums in the large metropolitan areas contributes to a void in local communication in some of the more remote rural areas. These areas still rely on word of mouth for passage of current information of local importance. Even locally produced newspapers do not reach some of these residents in a timely manner. Some residents who have no electricity or telephone service utilize citizen band radios as a principal link to others.

Surface transportation problems in the heavily populated areas are twofold. The construction of freeways and utilization of mass transit have lagged consistently behind the demands of rapidly increasing populations. Secondly, existing streets are overloaded, causing excessive wear and deterioration. Funding for street maintenance is a major problem in metropolitan Maricopa County.

Many roads in the rural areas are unpaved, contributing to air pollution problems. Airborne dust is a consistent and significant air pollutant throughout the region.

The Beeline Highway (SR 87) and SR 260 east from Payson were recently designated as the most hazardous roadways in the state. This is due to the tremendous traffic generated by recreationists on two lane roads which are far too narrow for the traffic volume. A plan to develop multi-lane divided roads and widening of certain areas needs to be accelerated.

Several bridges need to be constructed or modified in the area. A bridged crossing of Tonto Creek at Punkin Center is needed to serve residents east of the creek and improve access to Roosevelt Lake. A privately owned bridge near Winkelman on the San Pedro River needs to be taken over by the county to serve residents at that area. A bridged crossing of Highway 260 at Christopher Creek needs to be modified to reduce flood hazards. Crossings in the Dripping Springs area of Pinal County need to be improved.

Most major air carriers provide service to Sky Harbor International Airport in Phoenix. Other major local airports are located near Mesa, in Deer Valley, Scottsdale, and Litchfield Park. A consultant's report for the City of Phoenix identifies a need for three more major airports in proximity to the metro area.

Transcontinental rail service is available. Most major interstate trucking firms serve the Phoenix area, and truck delivery service is available to all smaller communities. Bus service is available to most communities, and also provides limited freight service to the outlying areas.

OPPORTUNITIES FOR ACTION

- Assist with development of basic utility services for remote rural residents.
- Support aggressive and timely construction of freeways and limited access roads in the Phoenix metro area.
- Work for adequate local funding to repair and maintain local roads.
- Support paving dirt roads which are subject to increasing usage.
- Assist local group efforts to install adequate crossings on various creeks and rivers.

COMMUNITY FACILITIES AND SERVICES

Water Systems

Growth communities have a continuing need to finance new, expanded, or upgraded water systems. Water systems in many older communities need significant repairs or replacement.

Some existing private water systems may need to be incorporated into municipal systems to provide adequate supply and quality. Water cost in many communities may become significant when coupled with system improvements, increasing energy costs, and decreasing supplies.

Sewer Systems

New treatment facilities are needed in many locations. Improvements and/or expansions are needed on many existing systems. Areas of critical concern include Apache Junction, Pine-Strawberry, and Oracle. Apache Junction's 15,000 population is served almost entirely by septic tank systems.

Operation and maintenance are continuing problems for most of the smaller communities' systems. Additional sources of funding and technical assistance are needed. Present grant and assistance programs are inadequate to meet current needs.

The Phoenix metropolitan area is fairly well serviced by major treatment facilities. Adequate plans exist to handle the anticipated growth, and implementation of water conservation programs should help reduce inflow to these systems.

Solid and Hazardous Waste Disposal

Solid waste disposal continues to be a significant problem in the area. The explosive growth anticipated in the region will place ever greater burdens on communities to manage solid waste. A basic conflict exists between the need for more disposal sites in reasonable proximity to population centers and the resistance of rural residents to having new sites located in their area.

Illegal dumping is widespread throughout the area. Laws are difficult to enforce. One county official noted a reluctance of local justices of the peace to do more than levy minimal fines on lawbreakers being prosecuted. This tends to make enforcement efforts ineffectual and does nothing to change public attitudes.

Hazardous waste materials are increasing in the area, especially as more high-tech industries are established. A major hazardous waste disposal site is planned for construction near Mobile, in Maricopa County. This will be a regional-sized facility which should meet the area's needs. Illegal dumping of these materials by small, disreputable companies will likely continue regardless of the availability of proper facilities. This poses a significant hazard, and calls for aggressive law enforcement and stiff penalties for law breakers.

Energy Utilities

Electricity is provided by the Salt River Project, Arizona Public Service, San Carlos Irrigation and Power District, and several smaller electrical districts. The allocation of power generated by Hoover Dam has a significant impact on many users in the area. This power is less expensive than most other sources. The allocation process is in negotiation as of this writing.

The Palo Verde nuclear power generation plant is located fifty miles west of Phoenix within Maricopa County. This plant is currently undergoing final testing procedures. It will provide power to Arizona utilities and to neighboring states.

The generators in Coolidge Dam are not presently operable. Much of the San Carlos Power system is in need of improvement. Many customers on the Gila River Indian Reservation and non-Indian users report periodic interruptions of services.

Natural gas service is supplied by the Southwest Natural Gas Company. This company recently acquired the distribution system previously owned by Arizona Public Service. The company has a high priority on replacing parts of the system which have deteriorated and become safety hazards.

Some remote residents do not have access to any utility connection. In most cases, the cost of bringing in utility connections is beyond the reach of the people.

Police and Fire

Police protection is provided by the Arizona Department of Public Safety, three county sheriff departments, and numerous local police departments. Most incorporated communities operate their own police departments.

The unincorporated communities of Sun City and Sun City West are unique in that they have relatively large populations with no local police service. Police assistance is provided by the Maricopa County Sheriff's Department.

Inadequate funding for staff is a problem to many rural areas. Problems have occurred in heavily used recreation areas when little or no police protection was available. County governments have been unable to fund optimum staffing for their sheriff's departments.

Fire protection is provided in numerous ways including municipal, private, and volunteer fire departments. Most residents, except those most remote, have access to some fire protection. However, response time in many rural areas limits the effectiveness of the protection.

Medical and Health Services

Medical services in the area are reasonably accessible to all residents. However, in some communities, such as Gila Bend, the residents must drive 45 to 60 miles to reach complete hospital care facilities. Both Phoenix and Tucson have extensive facilities and personnel available to area residents.

County and Indian health services provide assistance throughout the area. Emergency air and ground ambulance services are available.

Schools

All residents have access to public schooling. Most communities have access to community college branch campuses or extension college instruction.

Continuing outreach educational opportunities are needed, especially vocational training. Re-training programs will be needed for people who are unemployed or displaced by mining shutdowns or technological innovations.

Parks and Recreation

A number of recreational facilities exist in the area. Most incorporated areas have some park facilities. Most communities also need more, but lack the necessary funding.

Gila and Pinal counties do not have parks and recreation departments. Recreation planning in these counties is a function of the planning and zoning departments.

Housing

Some sub-standard housing exists on Indian reservations. Many Indian families cannot afford replacement housing and continue to live in rather primitive conditions, by modern standards.

The average cost of housing and financing is a detriment to many would-be home buyers throughout the area. Median new-home prices in the Phoenix area are about \$85,000 as of this writing.

Opportunities for Action

- Assist rural communities to evaluate water system needs and locate financial and/or technical assistance.
- Support planning and construction of new community sewage treatment facilities.
- Assist communities to find alternative methods of providing treatment plant operations, such as shared personnel.
- Support efforts to form an Economic Development District and participate in its project planning.
- Support strong enforcement of laws regarding illegal dumping of all waste materials.
- Assist with planning for new waste disposal sites.
- Assist rural communities to upgrade existing and/or install new utility systems.
- Support additional funding for law enforcement in high priority rural areas.
- Support anti-vandalism action groups, such as "Vanguard."
- Support improved medical care facilities for communities remote from Phoenix or Tucson.
- Support the "Keep America Beautiful" program in communities not now participating.
- Assist rural communities to evaluate energy needs and improved ways of meeting them.

OUTDOOR RECREATION

The Hohokam RC&D Area is nationally known as a winter retreat and recreational center. The use of outdoor recreational facilities is governed by the extremes of temperature found in the area. Heavy use of the scenic areas, drives, trails, mountain areas, and the open desert occur in the fall, winter, and spring. In summer, usage shifts to the forested high country and to the area's lakes and streams.

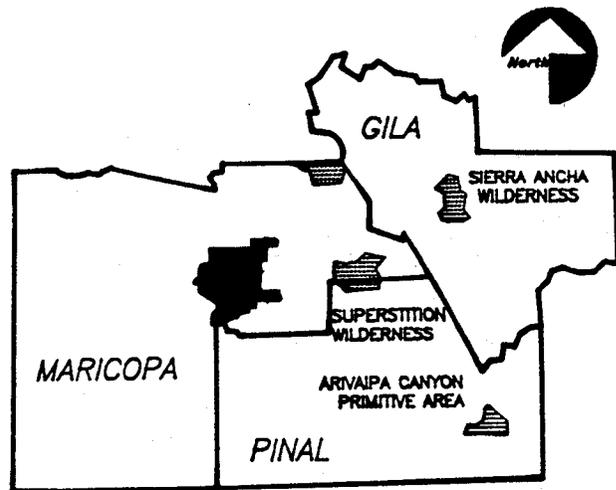
Demands on recreational facilities in the region are extreme due to the concentration of population in central Maricopa County. Outdoor recreation sites near the metropolitan areas are at a premium, particularly those which are water based. Proportionate increases in recreation demand will occur with rapid population growth in the area.

The year-round recreation demand of the resident population is further increased by the influx of winter visitors from October through April. These visitors place heavy demands on facilities in the warmer areas.

The Gila County high country receives tremendous usage in the summer months. National forest campgrounds are full by Thursday evening or Friday morning for weekend usage. All accessible sites near water are over utilized, regardless of developed facilities. Much more facility development is needed to keep pace with usage and to protect the forest resources.

The lakes on the Salt, Verde, and Agua Fria rivers receive heavy pressure throughout the summer. Saguaro Lake is most heavily used by residents of eastern Maricopa County. Entrance numbers are limited on summer weekends, and most beaches are filled by Saturday morning. Lake Pleasant serves the western part of Maricopa County. Pressures on this lake are very intense since it is the only large body of water in that part of the area.

WILDERNESS / PRIMITIVE AREAS

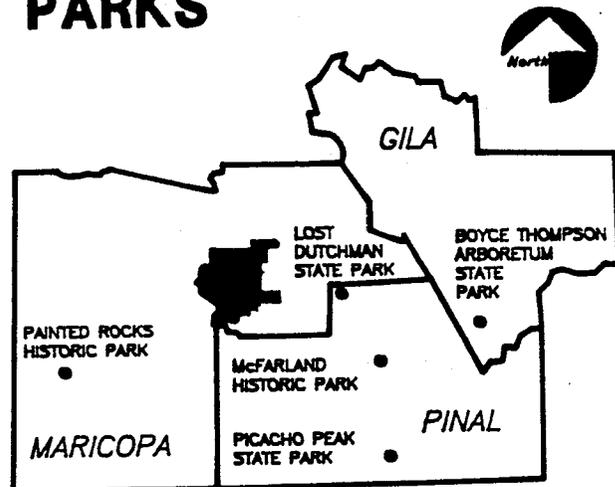


 Designated Wilderness

 Designated Primitive Areas

Source: Arizona Outdoor Recreation Coordinating Commission

ARIZONA STATE PARKS



Source: Arizona Outdoor Recreation Coordinating Commission

The lower Salt River below Stewart Mountain Dam is one of the most intensively used recreation sites in the United States. Tube floating is the most popular activity, attracting as many as 20,000 visitors daily on weekends. The Forest Service limits entrance numbers to this area, and public facilities are badly needed.

Water-based facilities within the metropolitan areas are also at a premium. There are about 1700 acres of lakes available or under construction in Phoenix. A string of lakes in Scottsdale's Indian Bend Wash project and numerous lakes in other metropolitan communities are heavily used by area residents. Most of these lakes are urban fisheries, and are regularly stocked with catchable-size fish.

Use of off-road vehicles is an increasing recreational activity throughout the area. The activity has a tremendous impact on range and forest resources. Fragile soils are disturbed by the vehicles' passage, leaving scars and erosion problems which are long lasting and difficult to treat. There is a need to educate the public about the impact of this activity, and to limit access in the most fragile areas.

The Arizona Statewide Outdoor Recreation Plan provides more detail on demand, use, and supply of recreation resources. It identifies camping and picnic facilities as highest priority needs in the region. The overriding problem for meeting recreation needs is lack of funding.

PRIORITY RECREATION NEEDS AND PROBLEMS BY COUNTY

<u>Needs</u>	<u>Gila</u>	<u>Maricopa</u>	<u>Pinal</u>
Camping	1	2	1
Baseball-Softball	2	4	3
Picnicking	3	1	2
Open space activities	4		4
Fishing	5		
Playgrounds		3	5
Nature study		5	
<u>Problems</u>			
Lack of funding	1	1	1
Vandalism	3	2	2
Lack of Parks/Recreation Department Access	2		
Information/Education		3	
Lack of public officials commitment			3

Note: Numbers represent priorities, by county, for each group.

Source: 1983 "SCORP" update, AORCC

CULTURAL RESOURCES

There are 74 places in the RC&D area which are on the National Register of Historic Places. In addition, there are nine sites listed on a state register of historic places. The state register provides no protection or financial assistance, only honorary designation. Places listed in the National Register are eligible for grants and some technical assistance to help assure their preservation.

Many of these sites have potential to contribute economic as well as cultural benefits to the area. These sites can be integrated into the tourism packaging for towns and areas, thus enhancing the tourism industry. Towns such as Globe might make particular use of these resources in this way.

Opportunities for Action

—Utilize cultural resources to enhance economic base of mining communities in Gila and Pinal Counties.

—Utilize available financial and technical assistance to develop water-based recreation sites such as Picacho Reservoir.

—Support development of water-based facilities in National Forests to enhance recreation sites and protect water quality.

—Encourage and assist private landowners to develop recreational facilities.

—Support and assist local governments in acquiring and developing park sites.

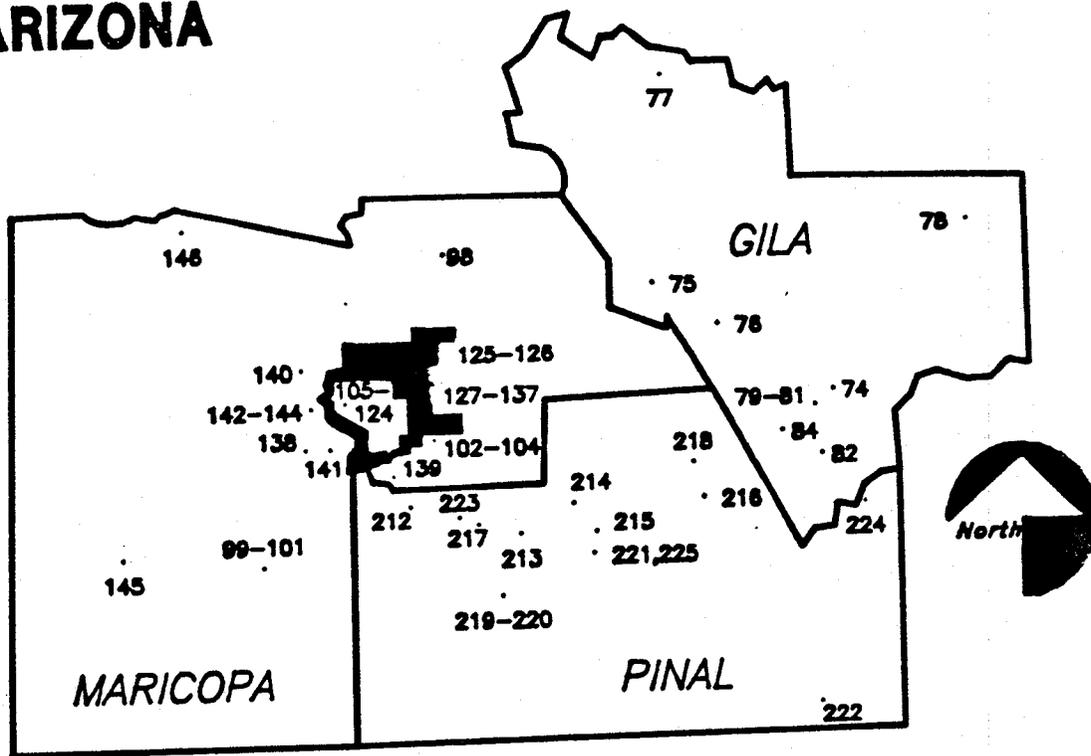
—Sponsor studies to identify ORV problems and suitable ways of minimizing the activity's impact on natural resources.

—Sponsor and support public and private efforts to reduce vandalism.

—Cultural resources should be considered prior to any undertaking.

—Evaluate all project effects on cultural resources.

NATIONAL REGISTER OF HISTORIC PLACES IN ARIZONA



Source: Arizona Outdoor Recreation Coordinating Commission

MARICOPA COUNTY

- 98 - BRAZALETES PUEBLO SITE
- 99 - FORTALEZA
- 100 - GATLIN SITE
- 101 - GILLESPIE DAM HIGHWAY BRIDGE
- 102 - HOHOKAM-MORMON IRR. CANALS
- 103 - MESA GRANDE
- 104 - ROBERT SCOTT HOUSE, PHX
- 105 - AZ STATE CAPITOL BUILDING
- 106 - EVANS HOUSE, PHX
- 107 - HOHOKAM-PIMA IRRIG. SITES
- 108 - CARNEGIE LIBRARY & PARK
- 109 - PUEBLO GRANDE RUIN
- 110 - ROSSON HOUSE, PHX
- 111 - MONROE SCHOOL, PHX
- 112 - OLD PHOENIX TOWNSITE
- 113 - ST. MARY'S CHURCH, PHX
- 114 - ADAMS SCHOOL, PHX
- 115 - FIRST BAPTIST CHURCH, PHX
- 116 - HOTEL WESTWARD HO, PHX
- 117 - KENIL WORTH SCHOOL, PHX
- 118 - ONG'S MARKET, PHX
- 119 - PHOENIX UNION HIGH SCHOOL
- 120 - US POST OFFICE, PHX
- 121 - HOTEL SAN CARLOS, PHX
- 122 - ROOSEVELT RESOURCE AREA, PHX
- 123 - GIBBES HOUSE, PHX
- 124 - HUMBERT HOUSE, PHX
- 125 - TALIESIN WEST
- 126 - TITUS HOUSE, SCOTTSDALE
- 127 - FARMER-GOODWIN HOUSE, TEMPE
- 128 - HACKETT HOUSE, TEMPE
- 129 - PETERSON HOUSE, TEMPE
- 130 - OUR LADY OF MT. CARMEL CHURCH, TEMPE
- 131 - ANDRE BUILDING, TEMPE
- 132 - PETERSON BUILDING, TEMPE
- 133 - TEMPE HARDWARE BLDG, TEMPE
- 134 - VIENNA BAKERY, TEMPE

- 135 - LONG HOUSE, TEMPE
- 136 - FRANKENBERG HOUSE, TEMPE
- 137 - 1931 TEMPE BRIDGE
- 138 - CASHION ARCHAEOLOGICAL SITE
- 139 - SAN MARCOS HOTEL, CHANDLER
- 140 - CENTRAL SCHOOL, PEORIA
- 141 - GILBERT ELEM. SCHOOL, GILBERT
- 142 - BEET SUGAR FACTORY, GLENDALE
- 143 - SAHUARO RANCH, GLENDALE
- 144 - 1ST NAT'L BANK OF GLENDALE
- 145 - PAINTED ROCKS, GILA BEND AREA
- 146 - GARCIA SCHOOL, WICKENBURG

PINAL COUNTY

- 212 - SNAKETOWN, GILA RIV. IND. RES.
- 213 - CASA GRANDE NAT'L MONUMENT
- 214 - 1ST FLORENCE COURTHOUSE
- 215 - ADAMSVILLE RUIN
- 216 - CHARCOAL OVENS, BUTTE
- 217 - COOK MEM. CHURCH, SACATON
- 218 - THOMPSON S.W. ARBORETUM
- 219 - CASA GRANDE STONE CHURCH
- 220 - CASA GRANDE WOMEN'S CLUB BGD
- 221 - COUNTY COURTHOUSE, FLORENCE
- 222 - AMERICAN FLAG PO & RANCH
- 223 - HA-AK INTAGLIO, SACATON
- 224 - COOLIDGE DAM
- 225 - FLORENCE HISTORIC DISTRICT

GILA COUNTY

- 74 - COUNTY COURTHOUSE, GLOBE
- 75 - ROOSEVELT DAM
- 76 - TONTO NAT'L MONUMENT
- 77 - ZANE GREY LODGE
- 78 - KNISHBA RUINS
- 79 - DOMINION HOTEL, GLOBE
- 80 - DOMINION LIBRARY, GLOBE
- 81 - ST JOHNS EPISCOPAL CHR., GLOBE
- 82 - GILA PUEBLO
- 84 - HOLY ANGELS CHURCH, GLOBE

ORGANIZATIONS & INSTITUTIONS

Many governmental agencies and local organizations are involved in the use and management of natural resources. Most of them actively cooperate in the RC&D program efforts.

The planning, development, and management of federal lands is carried out by the U.S. Forest Service, Bureau of Land Management, Bureau of Indian Affairs, Bureau of Reclamation, National Park Service, Fish and Wildlife Service, and the Army Corps of Engineers.

The Arizona State Land Department administers most of the state-owned lands. It has a Division of Natural Resource Conservation that supervises and provides direction to local Natural Resource Conservation Districts (NRCs).

NRCs are legal subdivisions of state government. They are governed by locally elected officials who serve without pay. The districts have action programs to assist land users in applying conservation practices on their lands. They have agreements with the Soil Conservation Service and the U.S. Department of Agriculture whereby technical assistance is provided to cooperating land users.

All of the RC&D area is within NRC boundaries, with the exception of that part of the Fort Apache Indian Reservation which lies in Gila County. The San Carlos Indian Reservation tribal government is evaluating the possibility of reorganizing the existing district which covers their lands. The new district would be organized under tribal authorities, rather than under state authority.

The Soil Conservation Service and the Army Corps of Engineers work with local units of government in the planning and construction of flood control projects. In addition, the state has several flood control assistance programs available through the Department of Water Resources. Maricopa County has a

well organized flood control district which has been very effective in implementing federal and locally financed flood control projects. Under state law, each county is empowered to function as a flood control district. However, Gila and Pinal counties do not have departments which deal exclusively with flood related problems.

The Farmers Home Administration makes loans to farmers and families of low and moderate income in rural communities. It also provides financial assistance for the development of essential public services to rural cities and towns.

The Economic Development Administration provides financial assistance to rural communities for installing or improving public facilities, and to encourage the development of new jobs through industrial developments. There are no Economic Development Districts as yet formed in Arizona to expedite the use of EDA programs. An application is pending to form the first such district which would include Pinal and Gila counties.

The newly formed state Department of Commerce also provides rural development assistance. Technical assistance is available to locate funding from a number of sources, and to provide services such as loan packaging. This department will also carry out economic planning assistance programs of the state.

The RC&D area encompasses two sub-state planning districts. The Maricopa and Central Arizona Associations of Government (MAG and CAAG, respectively), are regional councils of government which carry out broad based economic and resource planning assistance programs within these two districts. The RC&D council has formal working arrangements with both.

Each county has a planning and zoning commission charged with developing long range comprehensive plans. Maricopa County has the most recently published plan, dating from 1983. Gila County's comprehensive plan dates from 1972 and is in need of updating. Pinal County has no published comprehensive development plan.

Each county operates a wide range of departments to provide highway, parks and recreation, health services, and other local government services.

There are a number of irrigation, power, and other special purpose local districts throughout the RC&D area. The Central Arizona Water Conservation District is the local administrative agency for operation of the Central Arizona Project water delivery system. The Rio Salado Development District is charged with planning for flood control, recreation, and economic development along the Salt River from the Granite Reef Diversion Dam to the Salt's confluence with the Agua Fria River near Avondale.

There are numerous local government entities within the incorporated municipal areas of the region. There are also many local planning bodies and special interest groups interested in resource use. These organizations interact with the RC&D area when the RC&D program can be of assistance to their particular needs.

APPENDICES

SUMMARY OF RC&D FINANCIAL ASSISTANCE

PURPOSE	RC&D COST-SHARING RATES
Critical Area Treatment	Up to 65 percent of construction costs of the least costly and acceptable system of practices.
Flood Prevention	Up to 65 percent of construction and real property (landrights) costs not to exceed 100 percent of construction costs.
Land Drainage	Up to 50 percent of construction costs.
Multiple Purpose Flood Prevention - Land Drainage	Multiple-purpose flood prevention and land drainage channels will be cost shared up to 50 percent of the sum of construction and landrights costs not to exceed 75 percent of construction costs.
Farm Irrigation	Up to 50 percent of construction costs.
Fish and Wildlife	Up to 50 percent of construction costs.
Recreation Development ^{1/}	Up to 50 percent of construction costs.
Water Quality Improvement	Up to 50 percent of construction costs of the most cost-effective system of practices for removing water-use impairments.

^{1/} Until further notice, financial assistance will be provided only for recreation measure plans completed and signed before October 1, 1983.

ASSOCIATED MEASURES

Associated measures are activities adopted by the RC&D council to meet objectives of the area plan with other than RC&D financial assistance. These measures are implemented by RC&D council members, either as primary leaders or in a supporting role to other leaders or organizations.

Associated RC&D measures serve the following purposes:

Public Recreation Fish and Wildlife Developments. Outdoor land or water-based developments of public agencies plus large individual privately owned developments that are adopted as RC&D measures.

Water Developments. Multiple-purpose impoundments or other developments having public benefits.

Special Resource Studies and Inventories (except Accelerated Services). Studies and inventories designed to identify problems and/or opportunities which lead to developments or improvements, frequently through additional RC&D measures.

Highways, Roads, Trails and Scenic Highways. Transportation arteries associated with resource use and development. Does not include roads and trails that are assisted under Public Law 91-343.

Cooperatives, Associations or Development Corporations. Organization or expansion of cooperatives, associations or development corporations for purposes of improved advantage in marketing, services, production or purchasing.

Agricultural and Forest Product Processing or Marketing Industries. Establishment or expansion of an industry associated with processing or marketing of agricultural or wood products.

Industrial Developments (except those associated with Agriculture and Forestry). Establishments or expansion of an industry which provides additional employment or improved markets.

Community Facilities and Services. Installation of new or additional facilities such as hospitals, schools, water or sewer systems; or establishment of services such as fire fighting, solid waste pickup and disposal, etc.

Educational Measure. Establishing or expanding training or retraining programs.

Other. Includes any other measure which is associated with the project and adopted by the sponsors such as beautification, industrial parks, etc.

October 28, 1983

**REGULATORY STORAGE FOR CENTRAL ARIZONA PROJECT
WATER, FLOOD CONTROL ALONG THE SALT AND GILA
RIVERS, AND SAFETY OF DAMS ON THE SALT AND
VERDE RIVERS POSITION STATEMENT**

Since the adoption of positions in 1976, 1978, and 1981 on the subject of the proposal to construct a dam at the confluence of the Salt and Verde Rivers, the Hohokam RC&D Area sponsors have been provided substantial additional evaluations, principally through the Central Arizona Water Control Study and the Draft Environmental Impact Statement on the Regulatory Storage Division of the Central Arizona Project.

As a consequence, Hohokam RC&D Area, at this stage of the cooperative evaluation and planning process, identifies the Central Arizona Water Control Study Plan 6 as the Area's currently recommended action to provide regulatory storage for CAP water, flood control along the Salt and Gila Rivers, and to solve existing Safety of Dams problems on the Salt and Verde Rivers. The recommendation is based principally on Plan 6 functional ability to meet statutory obligations required by the authorizing legislation. Factors and criteria most significant in the evaluation process were:

Performance (ability to meet study objectives),
economics, environmental impacts, social impacts,
and public acceptability.

The Central Arizona Water Control Study team is highly commended upon the completion of its assignment.

March 24, 1976

**POSITION ON THE ROLE OF AGRICULTURE IN ENVIRONMENTAL
PLANNING FOR THE AREA OF THE HOHOKAM RC&D PROJECT**

Urban growth within the Project defies prediction. Convulsive urban sprawl at the expense of prime agricultural land has in a short time span limited the ability of agriculture to produce vital food, fiber and many other agricultural products essential to the economy and welfare of both the area and the Nation. Urban sprawl continues to cause other adverse effects on the environment and the economy, in spite of good starts in comprehensive planning by some of the planning bodies within the area.

Question: Should agriculture be preserved as a major industry?

A balanced urban-agriculture economy can provide a favorable environment for the inhabitants of the area.

Cash receipts from agriculture in 1973 within the Project area exceeded \$363 million, making it a major factor for land planners to consider.

Urban sprawl will continue unless city, county, Indian and state land planning authorities close existing gaps in the planning process. These planning units must establish a comprehensive and coordinated area-wide land use planning program which will directly engage agricultural representation as a major element. Contingent are legislative enabling acts, guidelines, incentives, and technical assistance at each of these four levels of the governmental process.

State government must assume a strong role in the coordination of federal programs. The proposed "Land Use Program for Arizona," including the resource administration bill (S.B.1014), if enacted, can materially assist in closing the gaps now prevalent in the comprehensive planning process. It is recognized that other major and sometimes overriding factors must be considered in comprehensive planning. Some of these are: the energy crisis, limited water supply and federal programs. These and many other factors have direct bearing on the maintenance of agriculture as a viable industry in the Project area.

New and innovative measures such as transferable development rights, and the "greenbelt" approach must be authorized by the state legislators and implemented by local governments.

LAND USE PLANNING POSITION STATEMENT

Framework

Land use, as used in this paper, shall mean the optimum use of land resources with a minimum of waste and impairment, consistent with the general welfare, health, safety and security of the people of this state. It involves the spatial distribution of people functions--residential, industrial, commercial, and agricultural uses; and spaces designated for institutional and leisure time functions. It is affected by the natural resources and, in turn, directly affects these natural resources.

Land use planning is multi-faceted, involving a broad frame-work. Some very important items are as follows:

1. Inventory of the natural resources: air, water, soil, geologic and biological.
2. Citizen input.
3. Activity patterns of people and their institutions as they require space.
4. Description of the phsysical facilities and the improvements needed to accomodate these activity patterns.

Concepts

1. Man's use of land is synchronized with the carrying capacity of the natural environment in which he exists.
2. The State of Arizona is one of the fastest growing states. New subdivisions and new towns are being developed, older towns are being incorporated. State and local land use plans require that safe drinking water, solid waste disposal facilities, sewer disposal systems, access roads, and flood protection be incorporated into any development plans.

When subdivided, the use of a tract of land is irreversibly altered and requires more delicate and complex treatment to permit human use with a minimum of drastic environmental change.

3. We support the premise that Arizona state government is responsible for the establishment of a comprehensive and coodinated statewide land use planning program which will result in the preparation of a statewide land use plan by the Environmental Planning Commission for all lands of Arizona, including Indian lands.

4. Coordination in the development of a statewide land use plan is a function of state government. This should be accomplished in cooperation with local governments to include the following actions:
 - a. Identification of land use and natural resource problems and opportunities.
 - b. Development of procedures for accomplishment of objectives.
 - c. Provision for resource information for local planning groups.
 - d. Provisions for retention of selected prime agricultural lands in agricultural uses.

5. It is the responsibility of state government to ensure that land use planners have a current inventory of their area's natural resources. It should include the following:
 - a. Soil: Soil is one of the most variable natural resources. Factors such as texture, depth, slope, and erosion are of extreme importance in determining a suitability for development purposes.
 - b. Air: Air quality is of utmost importance. We know of no substitute for pure air and feel that this resource should be constantly monitored and regulations be adopted to maintain air quality at safe levels. We believe that it is imperative that all concerned - industry, government and citizens - look to control zones by air sheds. The sources of pollution as well as the down-range affected area must be known before any effective prescription can be written. This is important since Arizona does have several different patterns of air flow, and various types of potential air pollution. Therefore, it is important that any regulation adopted by the state regulatory agency recognize these differences and create boundary control for more effective and equitable solution of any given problem.
 - c. Water: Water is a prime controlling factor in the growth of Arizona. Both ground water and surface water should be under constant monitoring to maintain its quantity and quality.

The state land use program must include an acceleration of water conservation measures of existing known supplies. It must also include accelerated research on new sources, and out-of-state importations.

- d. Biological: The vegetation and wildlife areas are important to the future natural resources of the state. The vegetative cover on soil controls the stability and influences the water yield on watersheds. Dominant plant and wildlife species are important for natural area resource management; therefore, the preservation of unique or rare species is necessary.
 - e. Geology and Topography: A description of the geology and topography of the state to ensure proper development should be available to land use planners. The location of steep slopes and geologic hazards to development, the location of unique geologic features and formations, and the location of mineral deposits and the potential development of these minerals should be available.
 - f. Energy: The potential for the development of energy from the sun, geothermal, and other sources should be fully investigated. Existing and future transmission lines for gas, oil, and electricity should be determined for rural and urban development.
 - g. Cultural: The cultural and historic resources of the state are valuable for future generations. Inventories of archeological and historic sites should be developed so they can be protected for future enjoyment.
6. A current inventory of major land uses and projections for the future use of all lands in the state should be maintained at the state level to guide land use planners. This would promote coordination between the state and local units of government.
 7. Consideration must be given to land development plans of local government in order that each may pursue its development policies to the maximum extent feasible, consistent with the general welfare of the people of the state.

Land use planning must begin immediately to provide for the present and anticipated future needs of Arizona's land resource. It must consider both the local, regional, and national needs and the ecological impact of carrying out these plans.

Although economic, social, and political pressures must be accommodated, decisions for wise land resource stewardship should be objectively based on scientific knowledge of resource development.

The Hohokam RC&D Project asserts that:

1. The ownership of land includes a stewardship responsibility for its management and use compatible with the long term needs of all people.
2. The concept of the highest and best use which in the past has largely reflected the private interest value of the land, must be redefined to include public interest values.
3. Private initiative in the development of land must function within a framework that will protect the public interest.
4. A land use policy should consider four broad categories of need as follows:
 - a. Land for primary production: crop, range, forest, watershed, and mineral lands.
 - b. Land for urban uses: commercial, industrial, transportation, and residential land.
 - c. Land for open space: lands used for recreational purposes, green belts, floodways and managed for the preservation of wildlife and wilderness.
 - d. Land with use limitations: this includes land which because of physical conditions or restrictions in use may lead to environmental degradation.

Land for Primary Production

Prime crop land is essential to produce a variety and quantity of food and fiber needed by the nation and the world. Economic forces that are removing prime land from agriculture have resulted in urban sprawl, speculative land investment, and increasing levels of assessment and taxation based on land values unrelated to crop productivity.

Arizona provides unique opportunities for the production of fresh fruit and vegetable crops. In fact, Arizona and desert California are about the only places in the United States that can ship fresh fruit and vegetable crops 10 months of the year. The supply of this land in the U. S. is extremely limited. Consideration for the continued use of this land in the production of these specialized crops must be considered in any land use plan.

Forestry and Rangeland

Forest and rangelands in Arizona must be maintained under the multiple-use concept. This concept holds that timber production and grazing are necessary to the basic economy of the state. It also holds that these lands may be used for recreational purposes and wildlife habitat. Much of the land in this category is public land which is managed by federal and state agencies and offers great opportunity for wise land stewardship.

After mineral extraction, the land should be restored to nearly original condition or improved for other appropriate uses.

Water

Existing bodies of water should be protected from siltation and watersheds managed in such a way as to produce the maximum water yields. In properly planning for the use of land, consideration should be given to the designation of areas for future water storage sites and land necessary to provide for water transfer.

Land for Urban Uses

The climate of Arizona will cause the state to continue to be attractive to people as a place in which to live.

Areas that are suited hydrologically and geologically for urban development should be identified and development encouraged.

Ways should be developed to encourage geographic distribution of employment opportunities as a means of reducing endless development of congested metropolitan areas.

The concept of total community planning can lead to orderly development without creating ghettos or other undesirable features often associated with older and larger metropolitan areas.

The study of alternative urban forms for metropolitan areas through the existing regional and local planning process can alleviate some of these problems.

Land for Open Space

Adequate open space is a "way of life" in Arizona. It may range in size from "mini" parks in downtown business areas to large wilderness tracts.

It is very important that open space be considered in any land use planning. There are many ways of acquiring open space. Most require the public to accept the financial responsibility.

Open space is necessary for a wide variety of uses which vary from simple contemplation to the operation of off-road vehicles. All uses must be recognized and incorporated into any land use plans.

Land with Use Limitations

There are some types of land in Arizona where, because of the delicate ecological balance, use or development can lead to environmental degradation. Examples of such types of land are areas of steep slopes where landslides might develop; flood plains where intensive development may lead to excessive erosion or frequent flooding; land with sparse vegetation where its removal leads to excessive erosion and downstream sedimentation problems.

March 24, 1976

**Position Statement on Water and Wastewater Management Within the Area of the Corps of Engineers
Phoenix Urban Study**

We have adopted the position that the maintenance of a high level of production on the prime agricultural land within Maricopa County is necessary.

We hold that adequate irrigation water for the vital crops for such prime agricultural land is a principal factor in environmental planning of this area. Subsequent actions and projects must provide priority to irrigation water allocations for the prime agricultural lands, including waters reclaimed from waste waters.

Consequently, we further hold that any coordinated water resource management plan for the Phoenix metropolitan area and Maricopa County must provide alternative solutions and implementations acceptable to agriculture which provide for the prime agricultural lands priority for the usable waste waters reclaimed from all sources (storm, drainage and flood waters, street and road runoff, and waters from waste water treatment facilities, including water treated in sewerage facilities). Solutions and implementation must in all cases recognize existing water rights established under provisions of Arizona State laws.

It is our view that before implementation of any of the alternatives proposed in the ongoing Phoenix Urban Study on water and wastewater, agricultural interests be provided appropriate representations. We suggest as a minimum, representation from the Maricopa County Farm Bureau and from each of the Natural Resource Conservation Districts within the Urban Study area, as well as from each irrigation water delivery district within the area.

December 6, 1975

FLOOD PLAIN MANAGEMENT POSITION STATEMENT

"Flood Plain Management" as used in this paper shall mean the overall management of areas subject to flood damage from waters in natural drainageways or from sheet flooding caused by development changes. It should include a program of corrective and preventive measures for reducing flood damage. It should also include, but not be limited to, the development of emergency preparedness plans, flood control installations, land use and control measures consistent with the general welfare, health, safety and security of the people within the flood prone areas.

The Hohokam Resource Conservation and Development Project Steering Committee believes that flood plain management is so important that it should become an integral part of the land use planning program for the state of Arizona.

The Steering Committee recognizes the exceptional storm drainage policies developed by the City of Mesa and has made them Appendix #1 of this position statement.

We urge all towns, cities and counties to consider them and develop flood prone area management policies suitable to the topography, soils and other conditions of their areas.

Rural Areas Between Urban Development

Provisions must be made in rural areas undergoing urbanization to manage the drainage to prevent damage to the property below. This will require detention basins, drainage channels, rivetments and other structural measures.

The necessary rights-of-way must be established at the earliest possible time and restricted to development.

There should be close coordination of codes and policies between local governments to facilitate uniformity in the management of flood and storm drainage problems.

Appendix #1

I. Residential Subdivisons

- A. All water which falls within the subdivision from a 50-year storm of 24 hour duration, must be retained within the boundaries of that subdivison. The method of retention is left up to the developer. The lots may be depressed to retain the storm water which falls on them and a retention area provided for the street runoff. If it is not desirable to depress the individual lots, a larger retention area may be provided to retain the runoff from the entire subdivisions. Two or more developers may join together to provide a larger retention facility to accomodate the runoff for more than one subdivision if all other criteria are met.
- B. Streets must be constructed to carry the runoff from a 10-year storm between the curbs. In cases where the peak flows from the design storm exceed the street capacity, underground pipes of sufficient size to carry the excess must be installed.
- C. The peak flows from a 50-year storm must be carried within the cross sections between buildings (from yards and street).
- D. Retention basins are permitted to a maximum of 3.5 feet in depth and must be constructed so that rainwater will stand no longer than 36 hours from the end of the storm. They should, where possible, be drained by pumping or controlled gravity flow into existing irrigation or storm drainage lines.
- E. Where practical, it is recommended that retention areas be made a part of a privately owned lot and covered by a drainage easement. If the basin retains water from a subdivison which has a co-operative type homeowners association, the maintenance of this basin must be done by the association. If the basin is to be constructed on a parcel of land which will not be sold and the maintenance responsibilities of which are not specifically defined, it will be necessary for the developer to install complete improvements on the parcel. These improvements are to include landscaping (grass and trees), irrigation system, and lighting, all subject to the approval of the City Engineer.

II. Commercial and Industrial

- A. All storm water from a 50-year storm of 24 hour duration (approximately 3-inch) must be retained on-site.
- B. Dry-wells are permitted to drain surface retention areas. However, the infiltration cannot be considered to reduce the size of the retention area.
- C. it is recommended that surface parking areas be graded to drain toward a landscaped area. When this is done, a light rain will drain away with little or no ponding on the paved surface. A storm of greater intensity will back up on the pavement, but the water will recede before it can damage the parking lot surface.

AIR QUALITY POSITION STATEMENT

The Hohokam Resource Conservation and Development Project believes that environmental quality can be improved and maintained through the proper, purposeful and timely application of the technology now available and that which is and will be developed within the decade of the 70's. We believe that such quality can be obtained, and the technology developed, only through a commitment on the part of every citizen, every group of citizens, every industry, and every level of government.

We, the sponsors of the Hohokam RC&D, hereby dedicate and commit our individual and collective efforts to these ends. And in committing ourselves, we believe that specific actions are available to us as we consider and deliberate upon the items brought before us. In our handling of these matters we will:

1. Continue to inform our membership on environmental quality standards, advances in technology and problems of compliance.
2. Review each submitted project measure in the light of its effect on the animate and inanimate resources of our community, and approve only those which will not further degrade the environment. In this respect our concern will not be limited by the RC&D boundaries.
3. Seek the support of all concerned citizens, industries, and agencies in the promotion of environmental quality.

As our Founding Fathers pledged their lives, fortunes and sacred honor to the establishment of a free and representative government, the sponsors of the Hohokam RC&D hereby pledge our energies and firm determination toward an environment free of air contaminants, free of water pollution, free of land and water misuse, and an environment in which Man cooperates with Nature in meeting his needs.

We invite others to assist and guide us, and, to so dedicate themselves to this purpose.

ADOPTED BY THE HOHOKAM RC&D STEERING COMMITTEE ON
MARCH 10, 1971.

RESOLUTION
SUPPORTING ALL FEATURES OF PLAN 6
INCLUDING CLIFF DAM

WHEREAS, efficient management of water has and will continue to be essential to Arizona's future; and,

WHEREAS, the Colorado River Basin Act provided for conservation and regulatory storage and flood control as part of the Central Arizona Project; and,

WHEREAS, Cliff Dam was determined to serve a critical function as CAP as part of Plan 6 not only by the U.S. Bureau of Reclamation but also by those participating in the 1981 Central Arizona Water Control Study; and,

WHEREAS, completion of the Central Arizona Project on a timely basis is crucial to the future of Arizona in general, and the Hohokam Resource Conservation and Development Area in particular; and,

WHEREAS, Cliff Dam would provide needed Verde River flood control capacity sufficient to insure the safety of Bartlett Dam; and,

WHEREAS, Cliff Dam would reduce the 200 year flood peak from 290,000 ft/s to only 92,000 ft/s at the confluence of the Salt and Verde Rivers, thus providing flood control for more than 1 1/2 million people in the Valley of the Sun; and,

WHEREAS, Cliff Dam will provide an additional 201,570 acre-feet of conservation storage capacity, thereby insuring future water supplies for the Phoenix valley in general; and,

WHEREAS, the lawsuit filed on September 19, 1985 by the Maricopa Audubon Society, et al, threatens timely completion not only of Cliff Dam but of the Central Arizona Project.

NOW THEREFORE BE IT RESOLVED THAT the Hohokam Resource Conservation and Development Area wishes to express its full support for Plan 6 and Cliff Dam; and,

BE IT FURTHER RESOLVED THAT Hohokam Resource Conservation and Development Area staff is hereby directed to forward this resolution to the Arizona Congressional Delegation and to Secretary of Interior Hodel.

Adopted by the Council November 25, 1985

**Willis Williams
Chairman**

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Buckeye-Roosevelt - 1979

East Maricopa - 1980

Eloy - 1979 & 1981

Florence-Coolidge - 1981

Gila Bend - 1979

Tonto - 1984

West Pinal - 1979

Wickenburg - 1984

Winkelman - 1980

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Map showing Ground Water Conditions, Tonto Basin Area, Gila County, US Geological Survey, U.S Department of Interior, 1979.

Map showing Distribution of Recoverable Ground Water in Phoenix Area, US Geological Survey, 1976.

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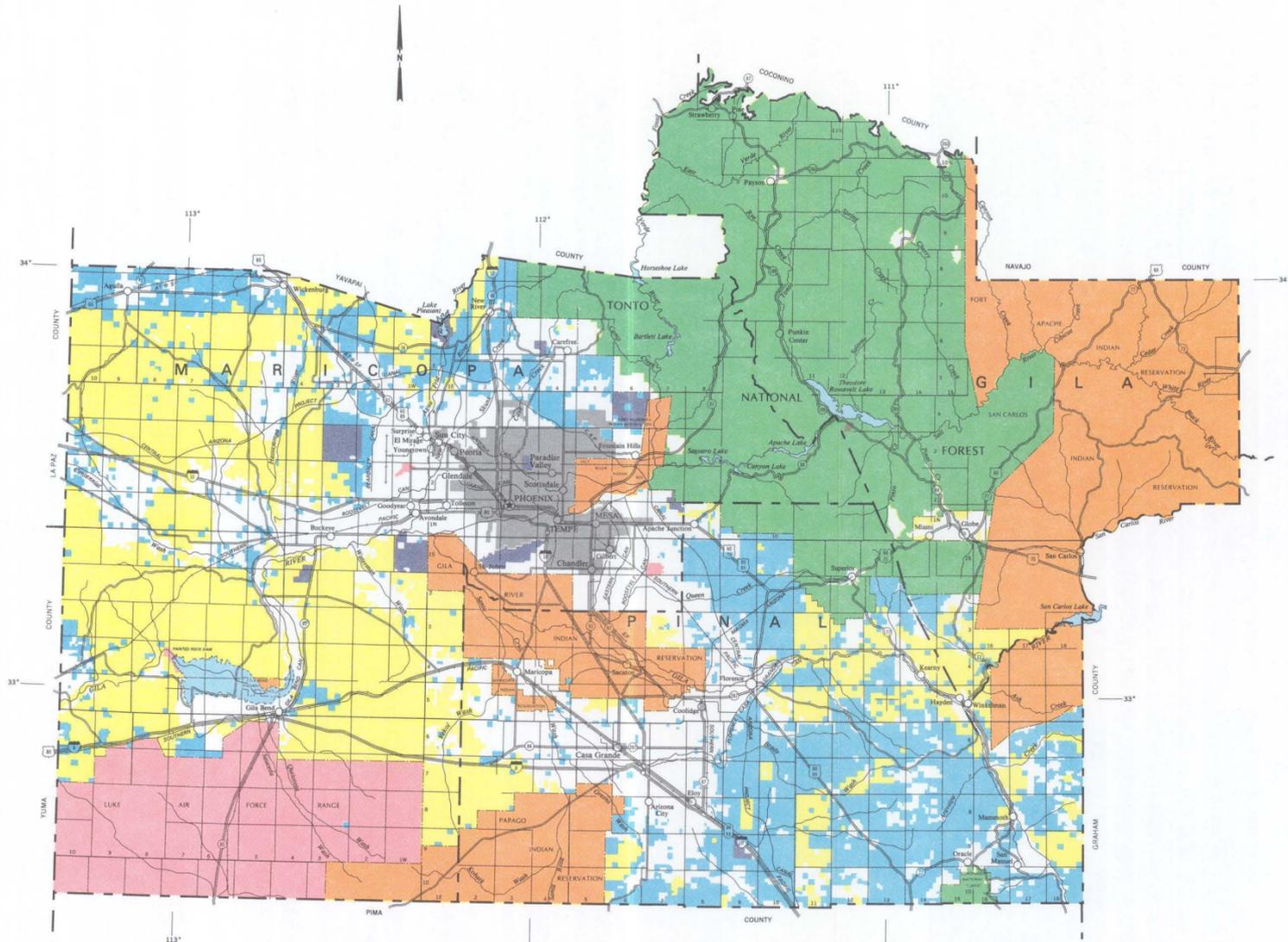
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Tonto National Forest Plan (proposed) Draft Environmental Impact Statement, USDA Forest Service, January 1985

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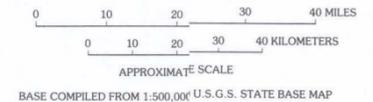
MAP SECTION





- LEGEND**
- BUILT-UP AREAS
 - BLM LANDS
 - STATE LANDS
 - NATIONAL FOREST LANDS
 - INDIAN RESERVATIONS
 - NATIONAL PARKS, MONUMENTS AND RECREATION AREAS
 - MILITARY RESERVATIONS
 - PRIVATE LANDS

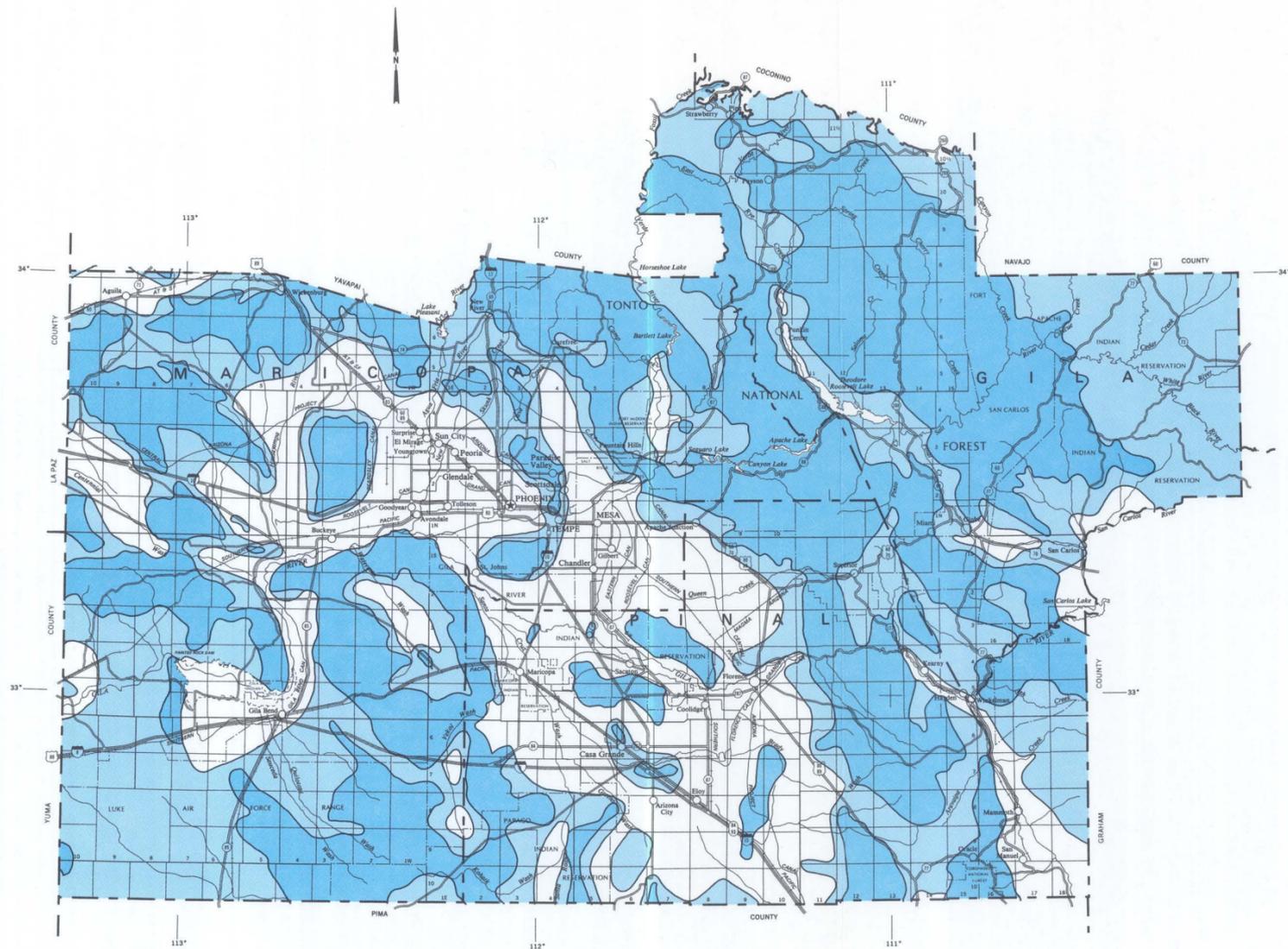
**LAND OWNERSHIP
AND ADMINISTRATION
HOHOKAM RC&D AREA
GILA, MARICOPA AND PINAL COUNTIES
ARIZONA**



BASE COMPILED FROM 1:500,000 U.S.G.S. STATE BASE MAP



SOURCE:
SURFACE MANAGEMENT RESPONSIBILITY MAP,
STATE OF ARIZONA, BLM, 1:1,000,000 AND
INFORMATION FROM SCS FIELD PERSONNEL



LEGEND

50 to more than 2,500—Most wells in area are capable of producing 1,000 gallons per minute or more

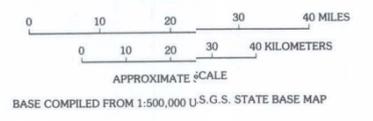
10 to 500

0 to 10—In the Plateau upland province the limits are 0 to 50 gallons per minute

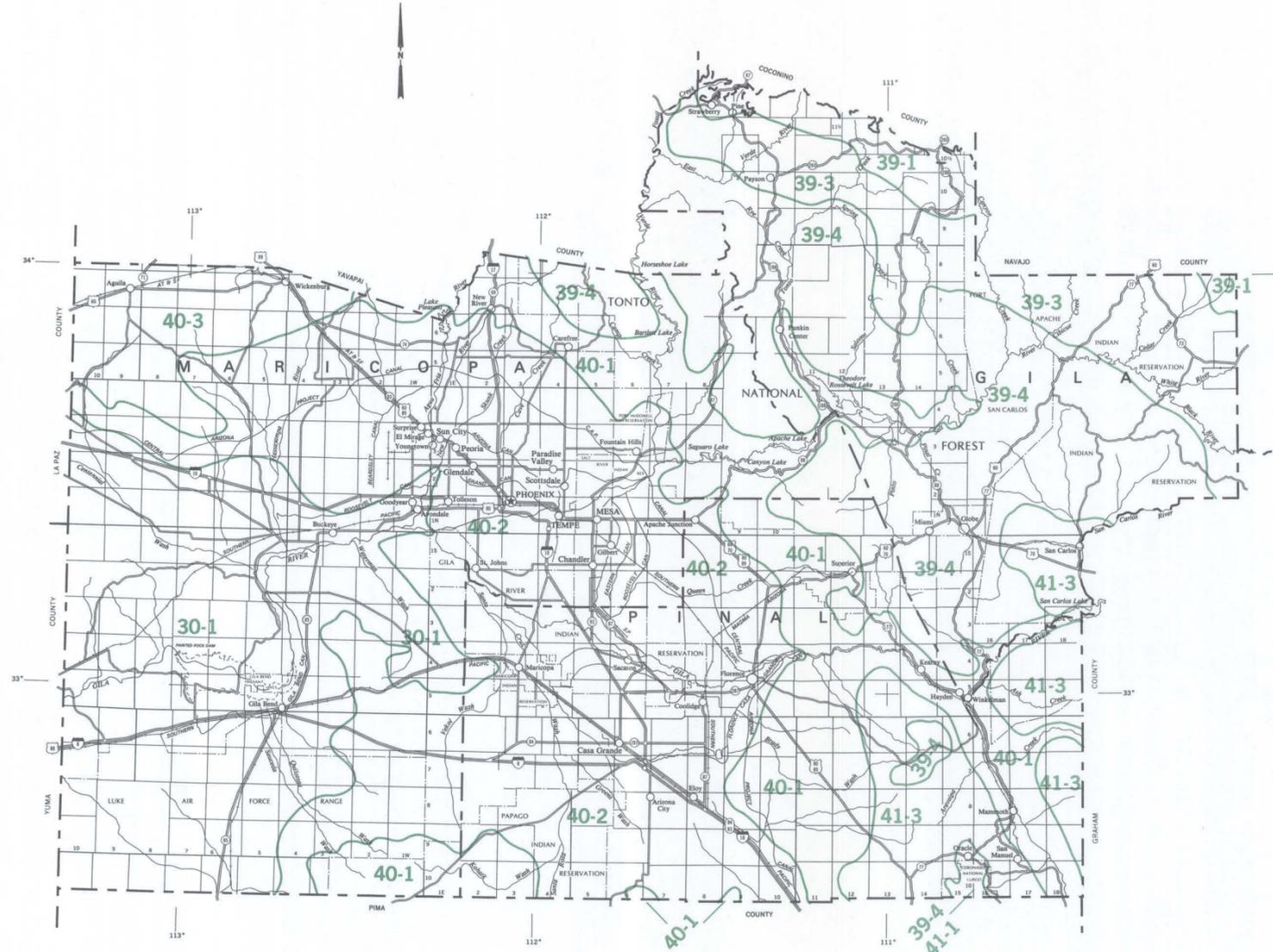
NOTE: The values of potential well production are based on the assumption that the well is located favorably, is sufficiently deep to tap the regional aquifer, and is properly constructed.



**POTENTIAL WELL PRODUCTION
HOHOKAM RC&D AREA
GILA, MARICOPA AND PINAL COUNTIES
ARIZONA**

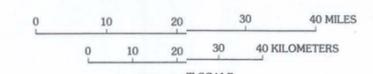


SOURCE:
Information from "Annual Summary of Ground-Water Conditions in Arizona,
Spring 1982 to Spring 1983" by U.S. Geological Survey.



- LEGEND**
- 30-1 Lower Sonoran Desert Shrub, 2" - 7"
 - 39-1 Mogollon Plateau Coniferous Forest, 18" - 30"
 - 39-3 Mogollon Mixed Woodland - Grassland, 16" - 20"
 - 39-4 Az. Interior Chapparal - Grassland, 12" - 20"
 - 40-1 Upper Sonoran Desert Shrub, 10" - 12"
 - 40-2 Phoenix Desert Shrub, 7" - 10"
 - 40-3 Central Az. Desert Grassland - Shrub, 7" - 12"
 - 41-1 Mexican Oak-Pine Woodland and Oak Savannah, 16" - 20"
 - 41-3 Chihuahuan Semidesert Grassland, 12" - 16"

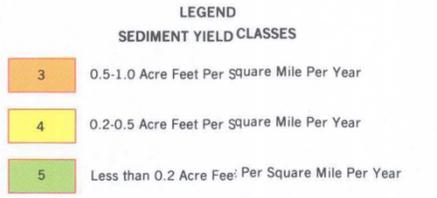
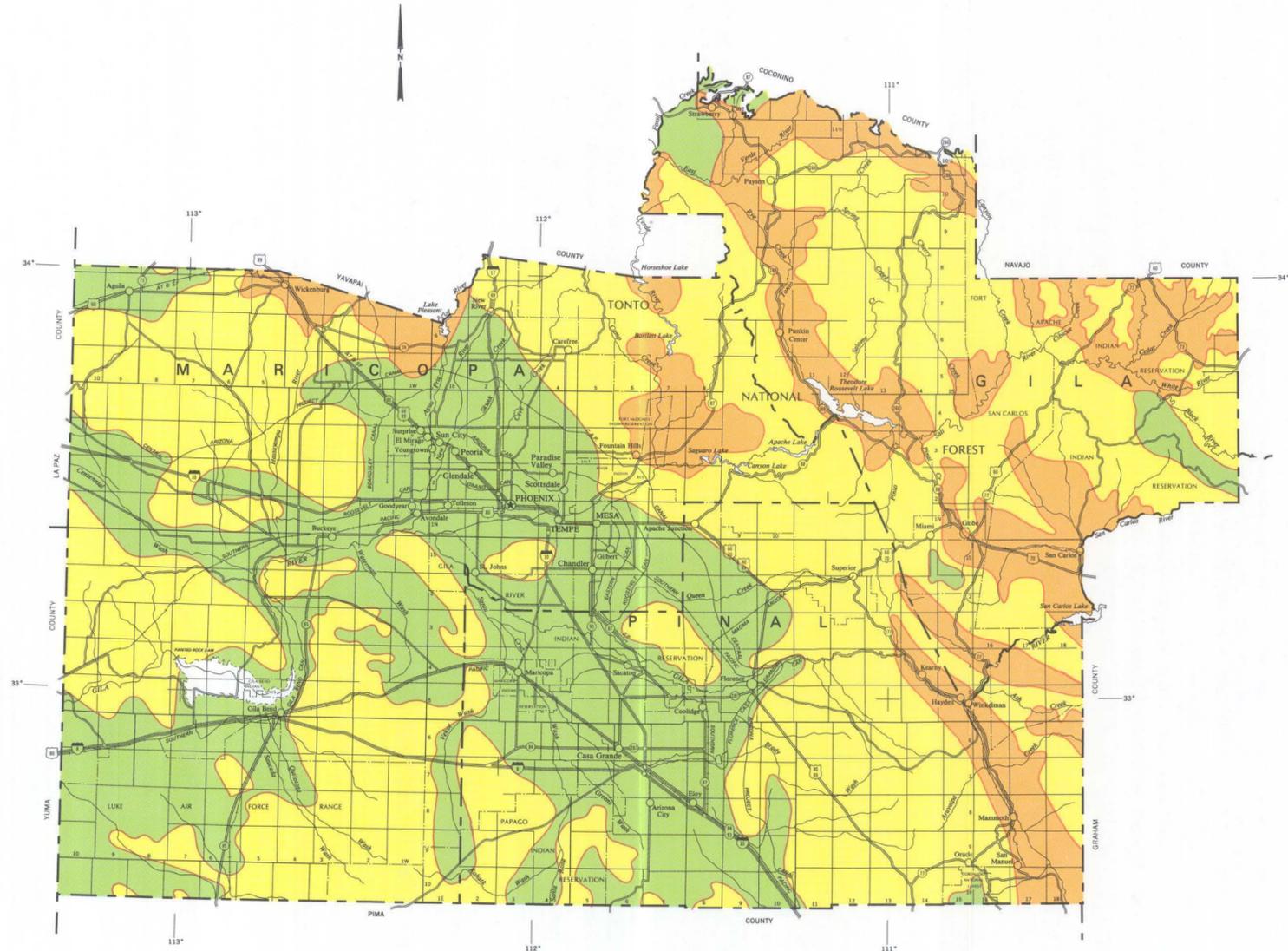
**ANNUAL PRECIPITATION
MAJOR LAND RESOURCE AREAS
HOHOKAM RC&D AREA
GILA, MARICOPA AND PINAL COUNTIES
ARIZONA**



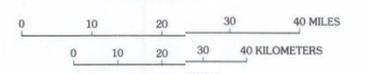
APPROXIMATE SCALE
BASE COMPILED FROM 1:500,000 U.S.G.S. STATE BASE MAP



SOURCE:
Data compiled by RC&D Planning Staff.

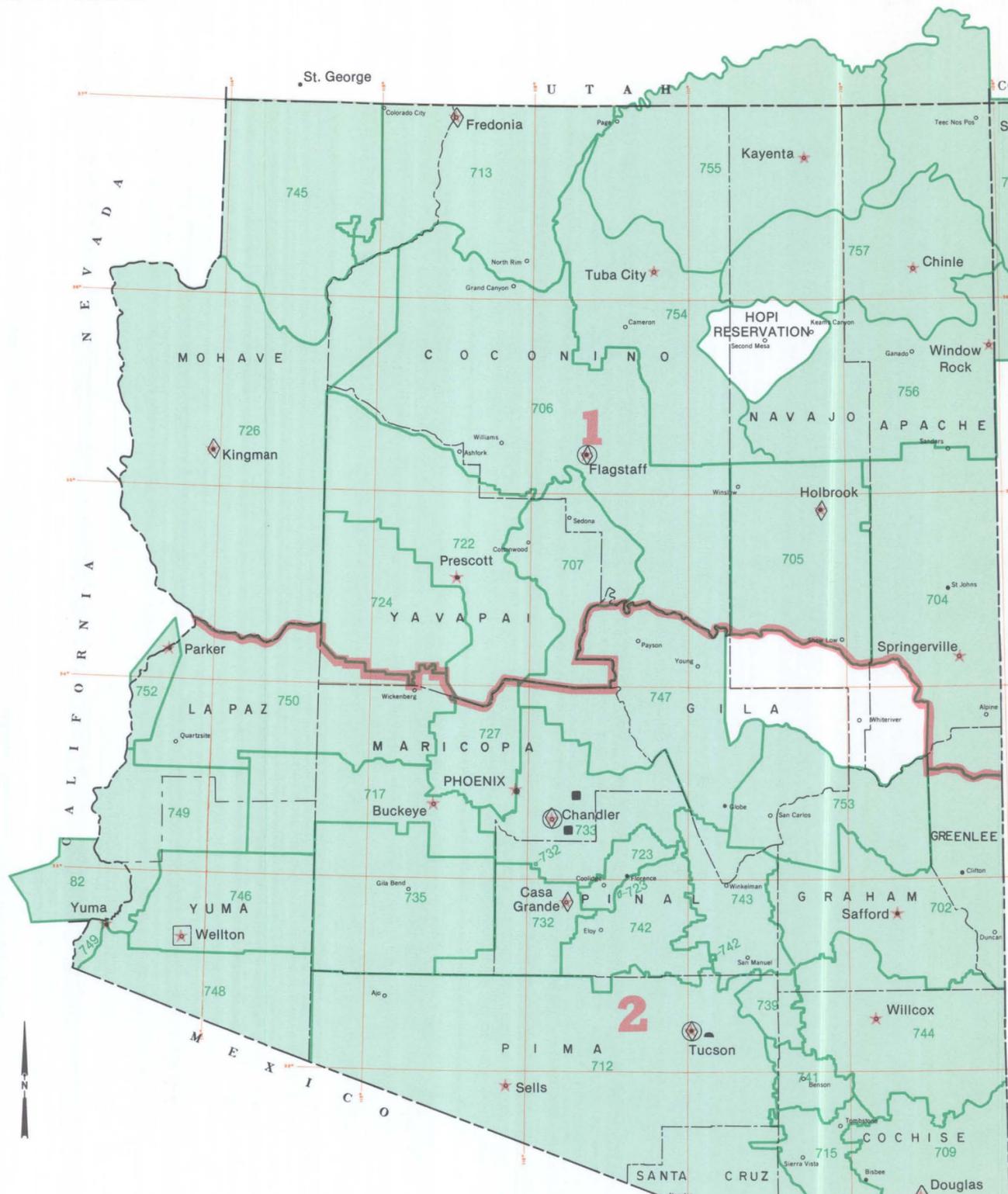


SEDIMENT YIELD
HOHOKAM RCD AREA
GILA, MARICOPA AND PINAL COUNTIES
ARIZONA



APPROXIMATE SCALE
 BASE COMPILED FROM 1:500,000 U.S.G.S. STATE BASE MAP

SOURCE:
 Information from "Sediment Yield, Arizona" (M7-S-22124-0).



LEGEND

STATE OFFICE LOCATED AT PHOENIX

AREA 1 OFFICE AT FLAGSTAFF

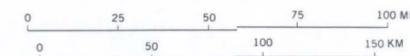
AREA 2 OFFICE AT TUCSON

FIELD OFFICES	SERVING NATURAL RESOURCE CONSERVATION DISTRICTS	FIELD OFFICES	SERVING NATURAL RESOURCE CONSERVATION DISTRICTS
FLAGSTAFF	706...COCONINO 707...VERDE	BUCKEYE	717...BUCKEYE-ROOSEVELT 735...GILA BEND
FREDONIA	713...FREDONIA 745...LITTLEFIELD-HURRICANE VALLEY	CASA GRANDE	742...EL OY 732...WEST PINAL 723...FLORENCE-COOLIDGE
HOLBROOK	705...NAVAJO COUNTY	CHANDLER	743...WINKELMAN 733...EAST MARICOPA 753...SAN CARLOS APACHE
KINGMAN	726...BIG SANDY	DOUGLAS	747...TONTON 715...HEREFORD 709...WHITEWATER DRAW
PRESCOTT	722...CHINO WINDS	PARKER	752...PARKER VALLEY
SPRINGVILLE	724...TRIANGLE 704...APACHE	PHOENIX	727...AGUA FRIA-NEW RIVER 750...WICKENBURG 702...GILA VALLEY
SERVING SOIL AND WATER CONSERVATION DISTRICTS		SAFFORD	744...WILLCOX-SAN SIMON
CHINLE	757...CHINLE	SELLS	712...PIMA
KAYENTA	755...NAVAJO MOUNTAIN	TUCSON	746...WELLTON-MOHAWK VALLEY
SHIPROCK	758...SHIPROCK	WELLTON	739...REDINGTON 741...SAN PEDRO
TUBA CITY	754...LITTLE COLORADO RIVER	WILLCOX	744...WILLCOX-SAN SIMON 749...LAGUNA 748...YUMA
WINDOW ROCK	756...FORT DEFIANCE	YUMA	82...BARD RC & D

- ★ SCS FIELD OFFICE
- 2 AREA NUMBER AND BOUNDARY
- RC&D PROJECT OFFICE
- ◇ SOIL SURVEY OFFICE
- WELLTON SALINITY PROJECT OFFICE
- CONSTRUCTION UNIT OFFICE
- ▲ PLANT MATERIALS CENTER
- 707 NATURAL RESOURCE CONSERVATION DISTRICT AND NUMBER
- COUNTY SEAT
- COUNTY BOUNDARY

ADMINISTRATIVE MAP ARIZONA

NOVEMBER 1985



SOURCE: BASE MAP PREPARED BY SCS, WTSC CARTO. UNIT FROM USGS 1:1,000,000 NAT. ATLAS. THEMATIC DETAIL COMPILED BY STATE STAFF.

USDA-SCS NATIONAL CARTOGRAPHIC CENTER, FT. WORTH, TX -1985