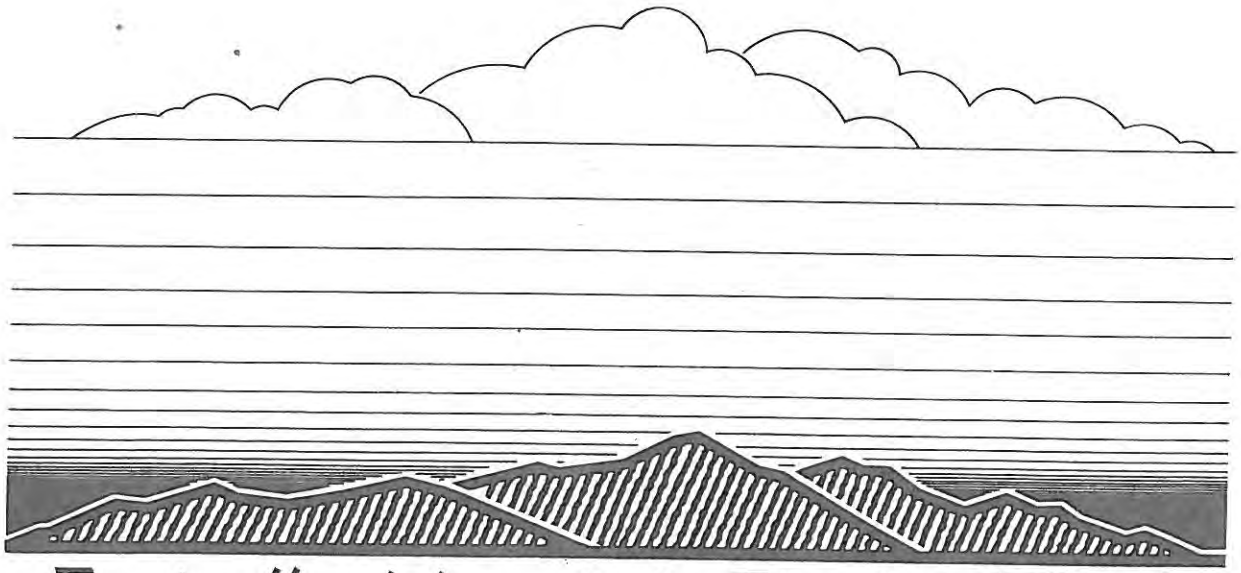

Estrella Mountain Regional Park
Long-Range Master Plan

ACKNOWLEDGEMENTS

This document is published with great appreciation to members of the Maricopa County Board of Supervisors, Parks and Recreation Parks Commission, and Parks and Recreation Department Staff and to the public for information, input and comment provided during the formation of this Master Plan.

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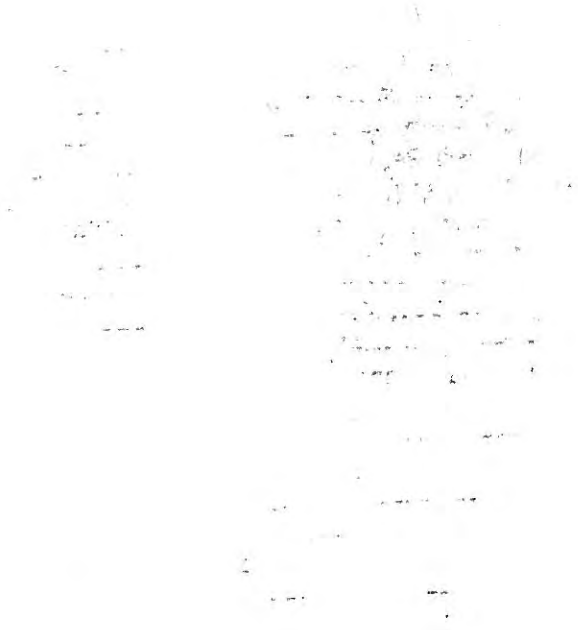

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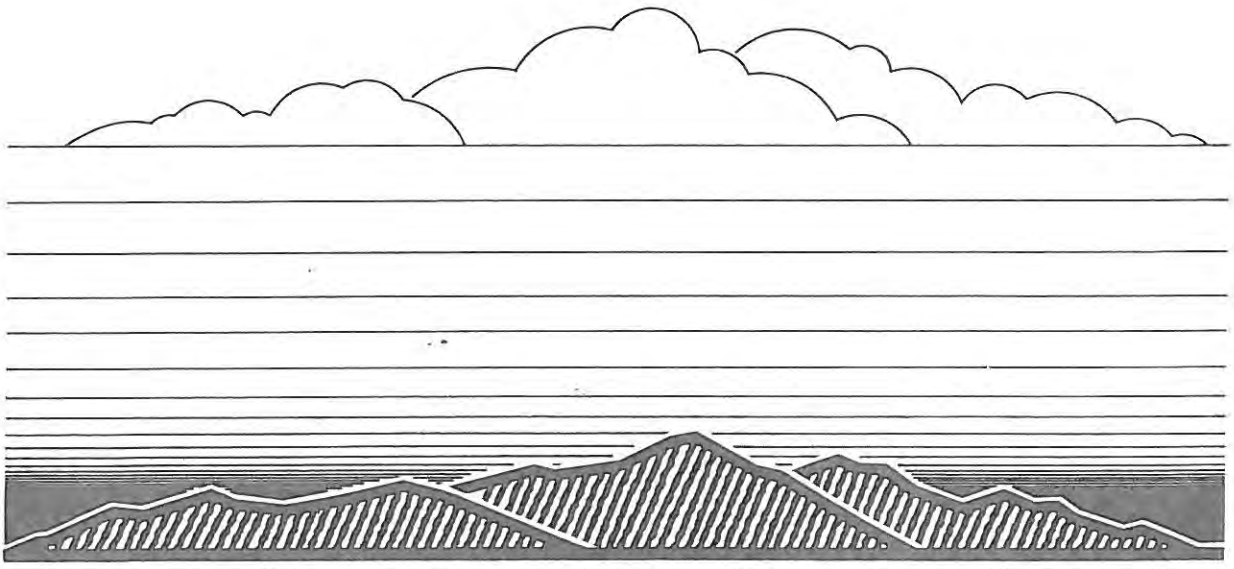


Estrella Mountain Regional Park
Long-Range Master Plan

A. INTRODUCTION

This document updates the Maricopa County Regional Park System Plan prepared for the Maricopa County Parks and Recreation Department by Sam L. Huddlestan and Associates dated December 1, 1965. This document also updates the Casey Abbott Semi-Regional Park Master Development Plan dated 25 May 1967, prepared by the Maricopa County Parks and Recreation Department staff, and a Master Development Plan also prepared by County Parks and Recreation staff specifically for the Casey Abbott Recreation area dated 1975. A great number of factors have changed since these plans were produced. The most significant factor which has affected Estrella Mountain Regional Park is the development of Interstate 10. With development and completion of I-10, the western valley and western suburbs have experienced, and will continue to experience drastic population increases. This increased population growth, in turn, is causing Estrella Mountain Regional Park to experience a significant increase in usage, reflecting a growing demand for more and improved recreation facilities in the west valley.

Experiencing this dramatic growth, and realizing that the capacity of the existing master plans had been reached, the County Parks and Recreation Department sought to update the master plan for the Casey Abbott Recreation area and prepare an overall Master Plan for the Estrella Mountain Regional Park.

B. PROJECT DESCRIPTION

1. Consultant Selection Process

In February of 1987 Maricopa County Parks and Recreation Department issued a Request for Proposal seeking consultant services for the preparation of a Long Range Master Plan of Estrella Mountain Regional Park. On 27 April 1987, the consultant team lead by BRW, Inc. was selected by the Maricopa County Parks and Recreation Department. The competitive selection process included both a written response to the County's request for proposal as well as an interview before the selection committee.

2. Objective

Along with a detailed Scope of Services the Maricopa County Parks and Recreation Department outlined five primary objectives to be considered and resolved by the consultant generating the Long Range Master Plan. The primary objectives included:

- Identification of the highest and best public use of the natural resource which is Estrella Mountain Regional Park.

- Identification of the current and long term public needs and desires regarding the use and enjoyment of this resource.

- Evaluation of the adequacy of the current park boundaries.

- Investigation of the economic feasibility of facilities included in the new Master Plan.

- Development of phasing and funding strategies for each of the elements of the comprehensive Long-Range Master Plan.

The County's overall goal was to provide "a comprehensive evaluation and analysis of the park's varied resources and a strategy for the orderly future use and development of the area while preserving the integrity of the resource".

3. Park Location

Estrella Mountain Regional Park is a 19,200 acre mountainous, desert park located near the confluence of the Gila, Salt and Agua Fria Rivers in south central Maricopa County. The park land is owned and managed by Maricopa County Parks and Recreation Department and lies 19 miles southwest of downtown Phoenix.

Regional access is provided by Interstate 10, which lies five miles north of the park. Local access is provided from the north by Bullard Avenue and Estrella Parkway (formerly Reems Road). Access from the east is provided by Indian Springs Road.

Estrella Mountain Regional Park is bounded on the north by the cities of Avondale on the northeast and Goodyear on the northwest. Along the western boundary lies the planned community of Estrella within the City of Goodyear. To the south lies unincorporated Maricopa County and Bureau of Land Management land, and to the east lies the Gila River Indian Reservation.

C. HISTORIC CONTEXT

Perched on a ridgeline of Estrella Mountain Regional Park, one could have witnessed the unfolding of many interesting events and lives that have been lived out in the desert landscape below. The history of the area begins with the Hohokam Indian culture. This group inhabited the area from around 500 A.D. to 1450 A.D., and relied heavily on the rivers and streams of the area for their existence. Water was obviously a critical element in shaping the cultures and history of this desert environment. The Hohokam culture was based almost exclusively on irrigated agriculture, according to the Historical Atlas of Arizona.

Traces of an extensive network of irrigation canals have been found along the Salt and Gila Rivers near Phoenix. Part of the Hohokam, or later cultures, utilizing a canal system, may have been located within the park boundaries of Estrella Mountain Regional Park. Evidence of possible

canals and a village site from an undetermined time have been located in Estrella Mountain Regional Park.

By 1600 A.D. the Maricopa and Pima Indians were the tribes living near or around the area of the current park boundaries. Their encampments or settlements were primarily along the Gila River and its tributaries. From 1600 to about 1860, Indian territory claims and the distribution of Indian tribes around the state changed significantly. However, the tribes living near or around the park have remained the Maricopa and Pimas.

The first European to set foot in Arizona was in 1536, and the first major expedition to explore this territory followed in 1539 lead by Fray Marcos de Niza. His expedition crossed the upper Gila River on their route north and prepared the way for Coronado's extensive expeditions which began the following year in 1540. Although numerous Spanish expeditions explored and traveled throughout Arizona, it was not until 1691 that Spanish explorers first set eyes on the Sierra Estrella Mountains and what is now Estrella Mountain Regional Park.

Father Eusebio Francisco Kino in 1691 followed the Santa Cruz River north to the Gila River and then followed the Gila west to California, passing by or possibly through a portion of the park (Figure 1). In 1697 and 1699, Father Kino also followed the San Pedro and Gila Rivers north and west past the Sierra Estrella Mountains. These later trips probably took him just to the south of the Sierra Estrella range. Father Kino would have been the first European to see these mountains. He was trained as a mathematician and cartographer so the records and maps of his travels in south central Arizona were more reliable than many of the early explorers.

Between 1687 and 1704, Father Kino explored and mapped many of the Indian encampments between the park and the current Mexican border. Father Kino in 1694 also recorded that the Pima's crops, under irrigation, in this area included cotton, maize, beans and melons. This was important for the travelers and traders who would follow in that it provided a source to replenish supplies. A 1695 Father Kino map showed the northern limits of the Pima territory as roughly following the Gila River. This is the first instance of a European map using the Gila River as a landmark to designate a boundary between tribal or territorial claims. Throughout history, the Gila River has been an important landmark and often used as a boundary or to reference the location of territorial claims.

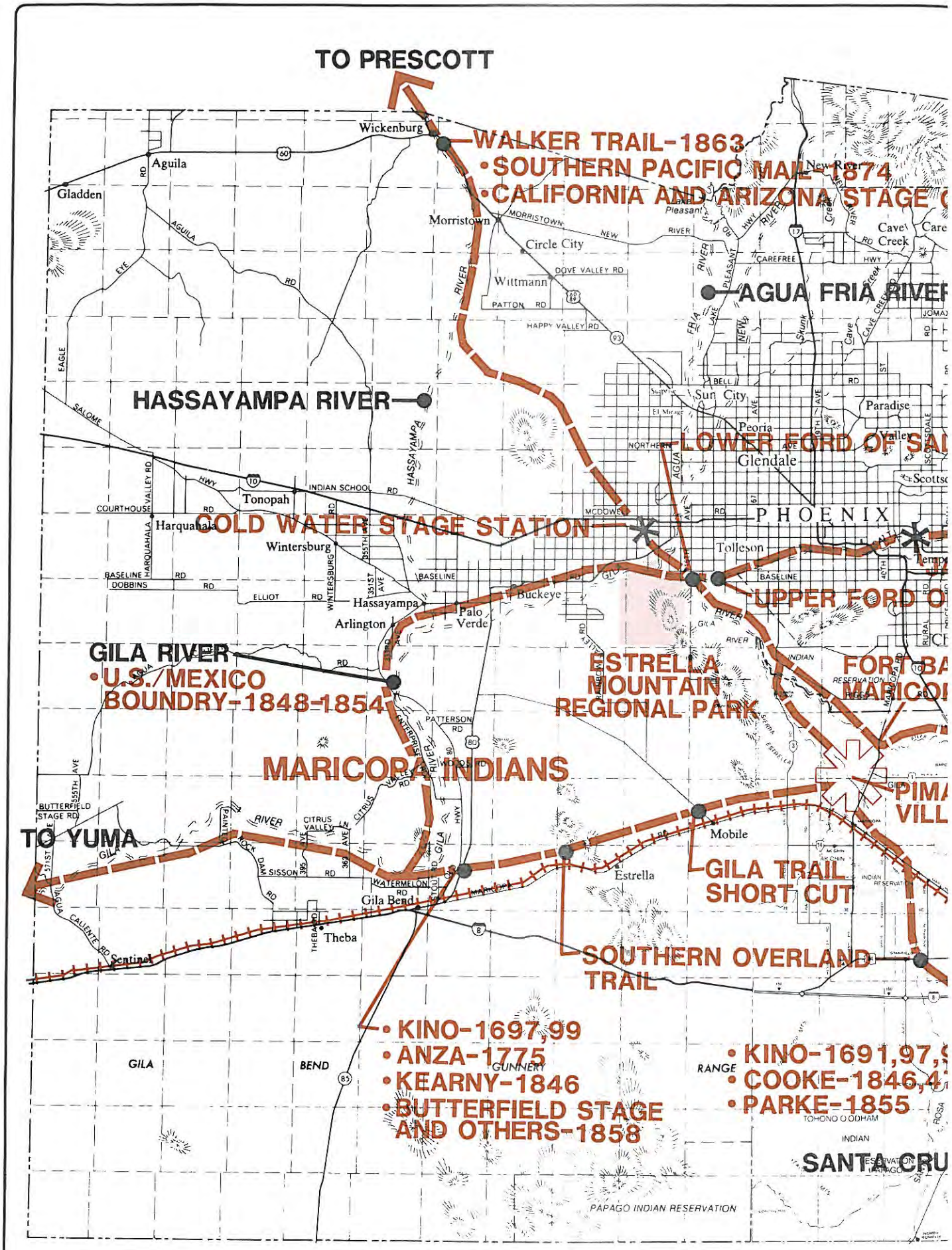
Other than the travels of Father Kino, the Spanish presence in the area of the Sierra Estrellas was limited and rather infrequent. No early missions or military outposts were established in the middle Gila Valley. Most of the Europeans that came into the area of the Sierra Estrellas were only passing through the desert to another destination. In 1775, Captain John Bautista de Anza lead a group of settlers down the Santa Cruz River and along the Gila River to California basically following Father Kino's earlier route. This would have been the first time this route past the Sierra Estrellas was used for migration by anyone but the local Indian populations.

From the earliest times of Spanish influence, until 1776, this central portion of Arizona was governed by Spain through the colonial government in Mexico City. It took 45 years to establish a new border. The current park would have been included in this newly established Interior Provinces of New Spain which was directly responsible to the crown of Spain. The Gila River was used to designate the northern boundary of these Interior Provinces.

The Mexican Revolution in 1822 ended Spanish rule in the desert southwest but interest in this region from the United States was beginning to grow. Boundary disputes between Mexico and the United States were beginning. The first anglo American presence in the middle Gila River area occurred in 1826 when Sylvester and James Ohio Patty, along with their party of trappers, made their way down the Gila River. This party would have walked through the extreme north section of the park and possibly even trapped or camped along the river on what is now park property. This first group's success began a brief era of trappers and mountain men traveling the rivers and streams of central Arizona in their search for furs and pelts. James Ohio Patty, along with others, returned the following year to trap and trade along the Gila and Salt Rivers. From this time forward, the number of nonnative travelers passing by the Sierra Estrellas increased more dramatically. Trapping and trading with the local Indians became more common in the 1830's and some panning for gold began in this area as well.

Among the most noted of the mountain men were Kit Carson, Antione Robidoux, Antione Leroux and Pauline Weaver. All of these men also worked as guides for the U.S. Army and other travelers into the area. Besides the mountain men and trappers, many other unknown or unrecorded travelers probably passed through the area. By 1846 the Gila trail was a well known route across the territory. However, since this territory was still under Mexican control, American presence was basically limited to traveling through the area or residing only seasonally. The temporary camps of the hunters, trappers or travelers was the extent of the anglo presence in central Arizona. The only permanent residence remained the native Indians.

When war broke out with Mexico in 1846, a new American presence in Arizona began. The American military now made a commitment to the southwest to gain further access to the west coast. However, this presence also helped insure the containment and decline of the native Indian population. General Stephen Watts Kearny, in 1846, led U.S. Army troops into the area while following the Gila trail to California. His mission was to help gain control of California from Mexico. While still in present day New Mexico, Kearny met Lieutenant "Kit" Carson heading east to Washington with news that the conquest of California had been accomplished. Kearny split up his troop of 300 dragoons sending 200 back to Santa Fe and continued on with 100 men. This smaller troop followed the Gila Trail and passed to the south of the park and the Sierra Estrella Mountains taking the most direct route west.


TO PRESCOTT
WALKER TRAIL-1863
•SOUTHERN PACIFIC MAIL-1874
•CALIFORNIA AND ARIZONA STAGE
AGUA FRIA RIVER
HASSAYAMPA RIVER
LOWER FORD OF SA
COLD WATER STAGE STATION
UPPER FORD O
GILA RIVER
•U.S./MEXICO
BOUNDRY-1848-1854
ESTRELLA
MOUNTAIN
REGIONAL PARK
FORT BA
MARICOP
MARICOPA INDIANS
PIMA
VILL
TO YUMA
GILA TRAIL
SHORT CUT
SOUTHERN OVERLAND
TRAIL
•KINO-1697,99
•ANZA-1775
•KEARNY-1846
•BUTTERFIELD STAGE
AND OTHERS-1858
•KINO-1691,97,
•COOKE-1846,4
•PARKE-1855
SANTA CRU
Wickenburg
Aguila
Gladden
Morristown
Circle City
Wittmann
New River
Cave Creek
Carefree
Sun City
Paradise
Peoria
Glendale
PHOENIX
Tolleson
Tonopah
Harquahala
Wintersburg
Buckeye
Hassayampa
Arlington
Palo Verde
Mobile
Estrella
Gila Bend
Theba
Sentinel
GILA BEND
GUNNERY RANGE
PAPAGO INDIAN RESERVATION
TOHONO O'ODHAM INDIAN RESERVATION

The Sierra Estrella Mountain range is the geological formation that diverts the Gila River to the north and initiates the giant horseshoe bend in the river as the Gila continues on its journey west. The extra mileage north along the river was more trouble to travelers such as Kearny's Army of the West, than the 40 mile stretch of open desert in a direct line to present day Gila Bend, where the trail rejoined the river. The Pima Villages, located strategically at the point of departure from the Gila River near the present town of Maricopa, were an important stop along the trail. Travelers were able to trade and restock supplies at this point, midway through the Central Arizona desert.

Kearny took with him Lieutenant William H. Emory of the Corps of Topographical Engineers. Emory's map of their route was the first relatively accurate map of the Gila Trail. Captain Philip St. George Cooke followed Kearny later the same year in command of the Mormon Battalion with orders to build a wagon road from the Rio Grande River to California. Cooke followed Kearny's route to southwestern New Mexico but because of the terrain was not able to continue along the Gila. Turning south, Cooke eventually picked up the San Pedro River in present day Mexico. He then followed the San Pedro and the Santa Cruz Rivers northwest until he met the Gila Trail. Cooke's route from the San Pedro River near present day Benson to near present day Casa Grande roughly resembles the route of Interstate 10 between those two points. After rejoining the Gila Trail near the Pima villages, Cooke continued on to California following Kearny's route past the Estrellas.

In 1848, the war with Mexico ended by the signing of the Treaty of Guadalupe Hidalog and the vast Mexican cession of land. In Arizona, all the land north of the Gila River was declared United States territory. The majority of what is now Estrella Mountain Regional Park would have remained in Mexican territory, but the small portion of the park on the north bank of the Gila would have been U.S. territory.

During the same year as the signing of the treaty with Mexico, gold was discovered in California initiating the gold rush of 1849. This discovery brought a major overland migration of fortune seekers and settlers past the Estrellas over the next few years. With the Gila River as the southern U.S. boundary, much of the overland route to California, across Arizona, was still under Mexican control. The trails and wagon routes that had just been mapped a few years earlier and now used by these travelers brought attention to the strategic value of these trails. U.S. Government needed to gain control of more land to the south of the Gila River to insure the availability of this overland route. This overland route was also a likely candidate for the transcontinental railroad that had been under consideration for many years. Through the Gadsden Purchase, the U.S./Mexico boundary was moved to its present day location. This meant that for the first time all land that is now in Estrella Mountain Regional Park became a part of the United States, as a part of the newly established New Mexico territory.

The Gadsden Purchase and the anticipation of a transcontinental railroad brought a new wave of activity into and through the central Arizona desert. Andrew Gray was hired by the Texas Western Railroad to run a preliminary survey across what was still Mexican territory south of the

Gila River. Gray finished his work in 1854 before the Gadsden Purchase. John G. Parke, also in 1854, resurveyed the area between the Pima Indian Village and the Rio Grande valley for the U.S. Government to find the best route. Parke again covered much of this route a year later, identifying easier and shorter alternative alignments. James Leach supervised the survey and marking of the El Paso and Fort Yuma wagon road in 1857 through this same area. All of these surveys passed just to the south of the park and the Sierra Estrella mountains.

The first stage and overland mail service connecting the west coast also began at this time. In 1857, the San Antonio and San Diego Mail line began operating passing to the south of the Park. The Butterfield Overland Mail stage line also operated through this area from 1858 until 1861. The Arizona Stage Company and others also began operating in the 1860's and 1870's.

During this time the U.S. Government also began establishing Indian reservations in Arizona. The first Reservation to be formed was the Gila River Indian Reservation in 1859. Initially this Reservation was established for the Pima and Maricopa Indians on their ancestral lands, just to the east and south of Estrella Mountain Regional Park. The initial land area included approximately 64,000 acres on both banks of the Gila River. This was the only Reservation set up before the Civil War. In 1869 the Reservation was increased to 145,000 acres.

Gold was discovered in the Wickenburg area in 1863. This brought some traffic along the Southern Overland trail, following the old Gila Trail, and then branched off towards Wickenburg and Prescott. During this same year, James R. Walker and his party of prospectors marked a north-south trail between the Pima villages and Prescott. This trail followed the Gila River north to the confluence of the Salt River, then crossed both the Salt and Agua Fria Rivers near the current Park boundaries. The trail then continued northwest until meeting and following the Hassayampa River to Wickenburg, and eventually winding through the mountains reached Prescott, the territory capitol. Freight wagons and stage coaches followed this road from the 1860's until near the turn of the century when rail connections were finally made between Prescott and the Southern Pacific route south of Phoenix.

During 1861, when the nation was involved in the Civil War, Colonel John R. Baylor of Texas took official possession of the "Territory of Arizona" for the Confederacy. All of present day Arizona south of the 34th parallel, which lies just north of present day metro Phoenix, was included in the Confederate claim. This unofficially put Estrella Mountain Regional Park under the Confederate flag by the signature of Confederate President Jefferson Davis in 1862. However, President Lincoln signed a bill in 1863 creating the new Territory of Arizona. This was the legislation that remained the law of the land at wars end. This bill divided the New Mexico territory at the current north/south boundary between Arizona and New Mexico.

Gold and precious metals continued to draw people to the mountains of central Arizona for a number of years after the Civil War. Attempts to find the precious ore did not fair well in the Sierra Estrellas,

however. Through the years a number of mining claims were filed even within current park boundaries, but nothing of consequence was ever found in or near the park.

In 1870, the Tucson, Arizona City, and San Diego Stage Companies ran tri-weekly service from Tucson to San Diego south of the park. Starting in 1872, the Tucson, Prescott and San Bernardino line left Tucson weekly for Wickenburg where connections could be made to Prescott and, from there, on to California. This stage probably followed the Maricopa Wells to the Wickenburg Trail found on an 1868 survey map on file at the Bureau of Land Management. The alignment of this trail came within one mile of the current park boundary in several locations. The Walker Trail, discussed earlier, would have been the same or a very similar route as the Maricopa Wells to Wickenburg Trail.

After the Civil War, came a more permanent anglo presence in the vicinity of the middle Gila River valley. The late 1860's and early 1870's brought the first anglo settlers into the south central Arizona area to establish farms. In 1867, Jack Swilling reopened prehistoric canals used centuries before to irrigate land along the Salt River. One of these canals became the Grand Canal. By raising hay on his land to supply nearby Fort McDowell, Swilling reestablished the productivity of the land and opened the way for the community of Phoenix to be established. By 1870 the Town of Phoenix had a total of 246 residents.

By 1869 there were 15,000 acres under cultivation near the Pima Villages. However, in 1869, a period of drought caused 1,200 Pima Indians to leave the reservation and move to the area along the Salt River to establish farms there among the white settlers. The reservation was eventually expanded to include some of this area along the Salt River.

During the 1870's Indian nations or tribes across the State were concentrated onto a few reservations. Even those lands were under constant pressure from white settlers for various reasons. In 1878, the Southern Pacific Railroad was granted a right-of-way across the original Pima-Maricopa Reservation. American settlements began to occur in sections of Arizona upstream from the Estrella Mountain Regional Park. White farmers and ranchers upstream began to use more and more water for irrigating their fields and, in turn, effected the availability and reliability of water to the Indian agriculture land below. By 1887 farmers upstream on the Gila River and its tributaries had taken much of the water needed for irrigation of the Indian farms. In 1882 and 1883, the Gila River Reservation was expanded again, but in 1911 the reservation was made available for the use of"such other Indians as the Secretary of the Interior may see fit to settle thereon."

One of the first schools built in close proximity to the park was built in the late 1880's at Altamont. This is the current site of Liberty, Arizona, just west of the park. The first post office at Altamont was opened at a cotton gin site in 1895. The town of Liberty did not officially receive its post office until 1901.

Coldwater was another town that grew up near the current park. In the 1890's Coldwater, later to become Avondale, was a stage station and

received a post office in 1896. The town site moved twice and finally settled at its present location with the name of Avondale given to the post office in 1911. Cashion, to the north and east of the park, was founded in 1910 and the town of Goodyear was not established until 1916 by the Goodyear Rubber Company.

Rail service was established to Phoenix by 1887 and rail connections to Wickenburg and Prescott followed in 1893. This rail access opened the area to growth as never before. Until the late 1860's and early 1870's the area around Estrella Mountain Regional Park was only a stretch of desert, to pass through in order to reach some other destination. Until that time only mountain men, trappers, and Spanish clergy had much interest in staying in the area, and then only on a short term or seasonal basis. After 1870, the area around the park with its potential for irrigated agriculture, became more of a destination.

In 1902, Congress set up the Bureau of Reclamation and in 1903 authorized the Roosevelt Dam project on the Salt River. These acts helped initiate the most dramatic growth the south central Arizona desert had seen to that point. By 1910, Phoenix had more than 11,000 residents, Tempe had nearly 1,500 and Mesa over 1,600. The Roosevelt Dam was finished in 1911 and after 1920 several more dams were built on the Gila River and its tributaries. The completion of the Coolidge Dam in 1929 was one of the final blows to the year around flow of water in much of the Gila River. From that time until very recently, the Gila River, as it traveled through the park, only had water flowing within its banks seasonally, after heavy rains, or when the dams above released significant amounts of water. During other times of the year, the once large river was only a dry bed.

In 1868, the Gila River was described as "a fine stream of water about 10 chains (680 ft.) wide...has a rapid current generally" by George Ingalls, a surveyor for the U.S. Government. In 1883, another government surveyor, R.C. Powers, described the water in the Gila River as "more than sufficient for irrigation". In 1910, the Gila contained water at all seasons of the year according to Guy V. Harrington, who was then surveying subdivision lines. But the flow of the Gila finally dwindled as the water was used elsewhere.

No major dams were built near the park but many water claims were filed beginning in the 1870's. Richard J. Hinton, in his Handbook to Arizona, in 1878 mentioned the existence of a canal two miles below the mouth of the Agua Fria. This ditch had been dug by a Prescott company to irrigate the fine sandy loam near the river. In 1886, the Buckeye Canal claimed 50,000 miners inches (104.1 acre feet) of water from the Gila River. The point of diversion was just below the junction of the Agua Fria with the Gila. A canal was to run westward along the north bank of the Gila.

In 1889, James H. Martineau, W.C. Masten, and Daniel Murphy organized the Excelsior Canal, claiming 60,000 miners inches (125 acre feet) to be used in irrigating nearly 200,000 acres. Water was to be diverted at a point one mile "more or less" above the crossing of the river by the Gila Bend-Phoenix Road, also known as Collin's Ford.

One of the most ambitious projects was proposed in 1891. The Sierra Estrella Canal Company, organized by Charles D. Belden and R.C. Powers, claimed 4,000 cubic feet per second (333.33 acre feet) of the constant flow of the Gila. The point of diversion was to be "on the south side of the Gila River at the north base of the round mountain on which the initial monument...is located". The canal would have run west along the foothills on the south side of the Gila for approximately 18 miles (bisecting Sierra Estrella Regional Park) and then turned southward and crossed through a low gap in the Estrellas. The canal was to continue south along the base of the Maricopa Mountains, cross the Southern Pacific Railroad west of Gila Bend Station, and turn west again, terminating near the Yuma County line.

In the Report of the Governor of Arizona for 1892, a proposed irrigation project of the Estrella Fruit Land Company to remove water from the junction of the Gila and Salt Rivers and transport it through three miles of tunnels to orchards flanking the right-of-way of the Southern Pacific in Maricopa, would have reclaimed 250,000 acres when completed.

In years following the completion of Coolidge Dam attempts at large-scale irrigation dwindled sharply. In 1946, the area was surveyed by the U.S. Geological Survey. The only active large canal was the Buckeye Canal and its south extension.

There were numerous homesteads or attempts at settlement in the area of Estrella Mountain Regional Park. The Gila River appeared to be a promising source of water, although most of its normal flow had been claimed and put to use by the time the majority of these filings had been made. As a result, few of the settlers remained in the region. Although the construction of the Coolidge Dam in 1929 ended the stream's flow, it did not discourage many hopeful homesteaders. During the years 1930 and 1931, probably as a by-product of the depression, there was a rebirth of homestead filings but most of these were canceled six years later. A listing of homesteads filed within the boundaries of Estrella Mountains Regional Park is available from the U.S. Bureau of Land Management and tract books. Twenty-four homesteads were filed between 1889 and 1950.

Only the northern edge and the flat southwestern area within the boundaries of Estrella Mountain Regional Park was suited for cultivation. The northern strip along the Gila River was cultivated fairly successfully from at least the last decade of the 19th century until the mid-thirties when the flow of the Gila was dammed. Plans to irrigate land in the southwest quarter of the park from wells and mountain runoff did not succeed.

Because the dryness and the mountainous nature of the park, its use as range land was minimal. The State Land Department established the carrying capacity of these lands at three cows or less per section. Only one operating outfit leased grazing lands in the park. In 1886, William R. Beloat of Buckeye and his brother, John, located a small herd on the Gila River near Liberty and filed the SL brand, which is still in use by his grandson, Kenneth Beloat. During the years that followed, William Beloat added to his range holdings along the Gila.

Although the area of Estrella Mountain Regional Park was not used successfully as either farm or range land, lands adjoining the park to the north have been extensively cultivated by both private individuals and the Goodyear Farms; those to the east on the Gila River Indian Reservation have been under cultivation for several centuries.

The Sierra Estrellas is not a mineralized area although prospectors probed there in their relentless search for wealth. During the 1940's a few oil or mineral leases on state lands were issued but these were not renewed. There was only one patented mine in the region, the Buckeye Placer, patented in 1915 by the Wessex Water Company. The presence of natural caves in the higher parts of the range has given rise to legends of Indian "mines" and treasure troves, typical of the tales of "lost-mines" common to the Southwest. Geologists give no credence to mineral wealth in the area and archaeologists testify that the Pima Indians living in the area were not metal-workers.

In summary, during the 1930's and 1940's there was some significant interest in the area that is now park property, however, no plans resulted in permanent development. In the 1940's the Maricopa County Parks and Recreation Department was acquiring property and developing their park system. Although County park property was primarily concentrated in the urbanizing Phoenix area at that time, a few community type parks were developed in the outlying areas of the County. The County Parks and Recreation Department continued to look for additional opportunities to develop parks and in 1953 a spark of interest from citizens in the Goodyear and Avondale area brought the County's attention to provide a community park in that part of the valley.

In July of 1953 interested citizens in the Goodyear and Avondale area met to investigate the possibilities of establishing a county park in the west valley. The involvement of this large group of citizens was added to the efforts of the County Parks commission, and the County Parks and Recreation staff to create Estrella Mountain Park later that year. The first property for this park was purchased in September of 1953, being one of the first acquisitions for what would later become a regional park. Estrella Mountain Park initially contained 828 acres, 428 acres of purchased property and 400 acres of leased land, and a first years operating budget of less than $10,000. Many of the first facilities and early park development was accomplished by volunteer efforts. Time, materials, equipment and labor were donated by many different businesses, organizations, and individuals through the years. Especially during the first two years of the parks existence, these volunteer efforts greatly accelerated the development of both infrastructure and recreation facilities in the park without spending large amounts of public funds.

For the first five or six years Estrella Mountain Park was considered as a community park. However, this perspective of the park began to change in the late 1950's. A National Recreation Association study completed in 1958 prompted the Maricopa County Parks and Recreation Department to begin applying the concept of regional parks to their young parks system. From this point forward the Parks and Recreation Department began to acquire large tracts of land just outside the developing metro

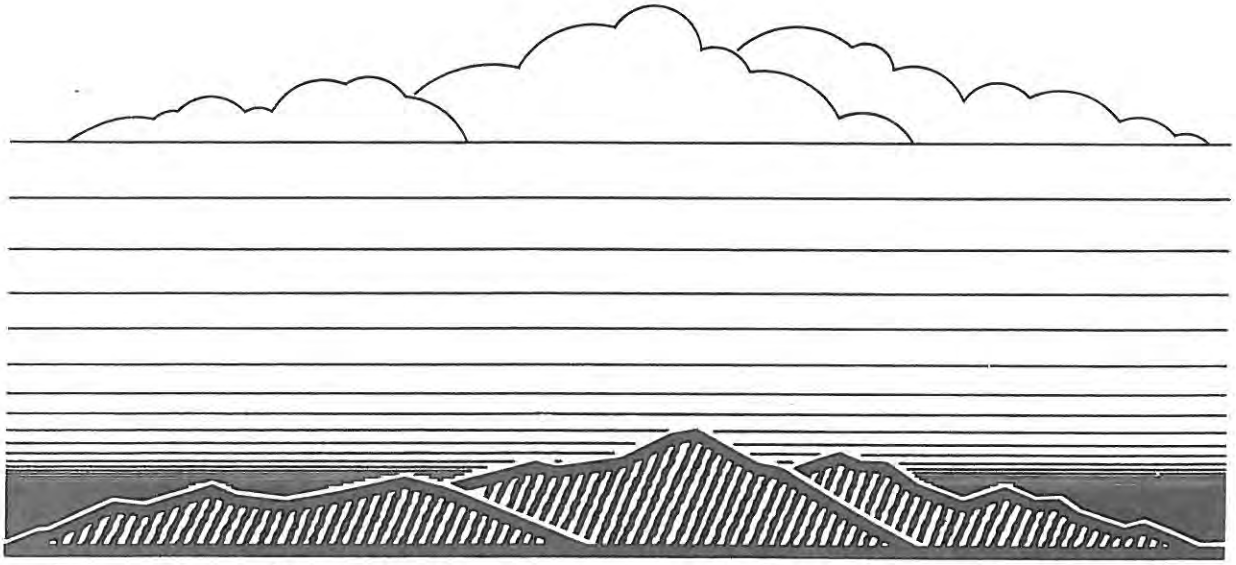
Phoenix area as a regional recreation resource. Estrella Mountain Park was one of the parks to be designated as a regional park.

By 1962, Estrella Mountain Regional Park, had grown considerably in size and during that fall the first nine holes of the Sierra Estrella Golf Course were opened. In June of 1963 the Parks and Recreation Commission recommended that the northern portion of Estrella Mountain Regional Park be reclassified as a semi-regional park, and that the name of this portion of the park be changed to Casey Abbot Park. In April 1964 the 2,123 acre northern portion was dedicated as Casey Abbot Semi Regional Park after the late H.S. Abbot. Mr. Abbot was chairman of the Maricopa County Planning and Zoning Commission from 1949 until his death in 1962.

In 1965 an attempt to establish a riding stable concession was unsuccessful but efforts were continued to provide more equestrian opportunities in the park. These efforts were not fully realized until 1982 when the present arena facility was opened. The current Sierra Estrella Golf course was also expanded during the mid 1960's. Nine new holes were added and opened to the public after being dedicated in February of 1967. Land acquisitions also continued throughout the 1960's and 1970's. In 1982 the existing Bullard Avenue bridge was completed providing more reliable access to the park across the Gila River. Vineyard Road was also constructed at that time to separate local auto traffic from auto traffic within the park. This separation allowed entry into the park to be controlled.

Even though there has been a steady growth and expansion of facilities in the park, development is still limited to a very small portion of the park. The majority of the landscape within Estrella Mountain Regional Park has resisted change over the many centuries that man has inhabited this portion of Arizona. Many plans and dreams for this landscape were never fully implemented or never realized at all because of the harshness of the climate and terrain. Most of the landscape of the park today remains pristine desert, very similar in appearance to the landscape seen by the first European explorers who traveled past these mountains and foothills. These factors that have worked to resist development have preserved a very valuable resource for the Maricopa County Parks system. Estrella Mountain Regional Park contains many untapped resources and excellent potential for providing a greater variety of quality recreation opportunities.

II
Project Analysis



Estrella Mountain Regional Park
Long-Range Master Plan

A. AREA WIDE ANALYSIS

The area surrounding the park was studied and evaluated to determine possible effects on park use and development. Opportunities and constraints were identified and evaluated. The following sections of this area wide analysis describe the results of that study.

1. Regional Recreational Facilities

The current County Regional Park system is evenly distributed around the perimeter of the Metropolitan Area providing easy access to many regional recreation opportunities (Figure 1). Today, these parks help function as a part of the edge or transition between urban development and the natural desert environment surrounding the Metropolitan Area. However, in the future, development will begin to surround some of these parks, and their significance and value to the Metropolitan Area as natural open space will increase. As some of these parks begin to resemble islands of open space or wilderness surrounded by urban development, there will be a significant increase in both the amount of users and the variety of activities these parks will be expected to provide.

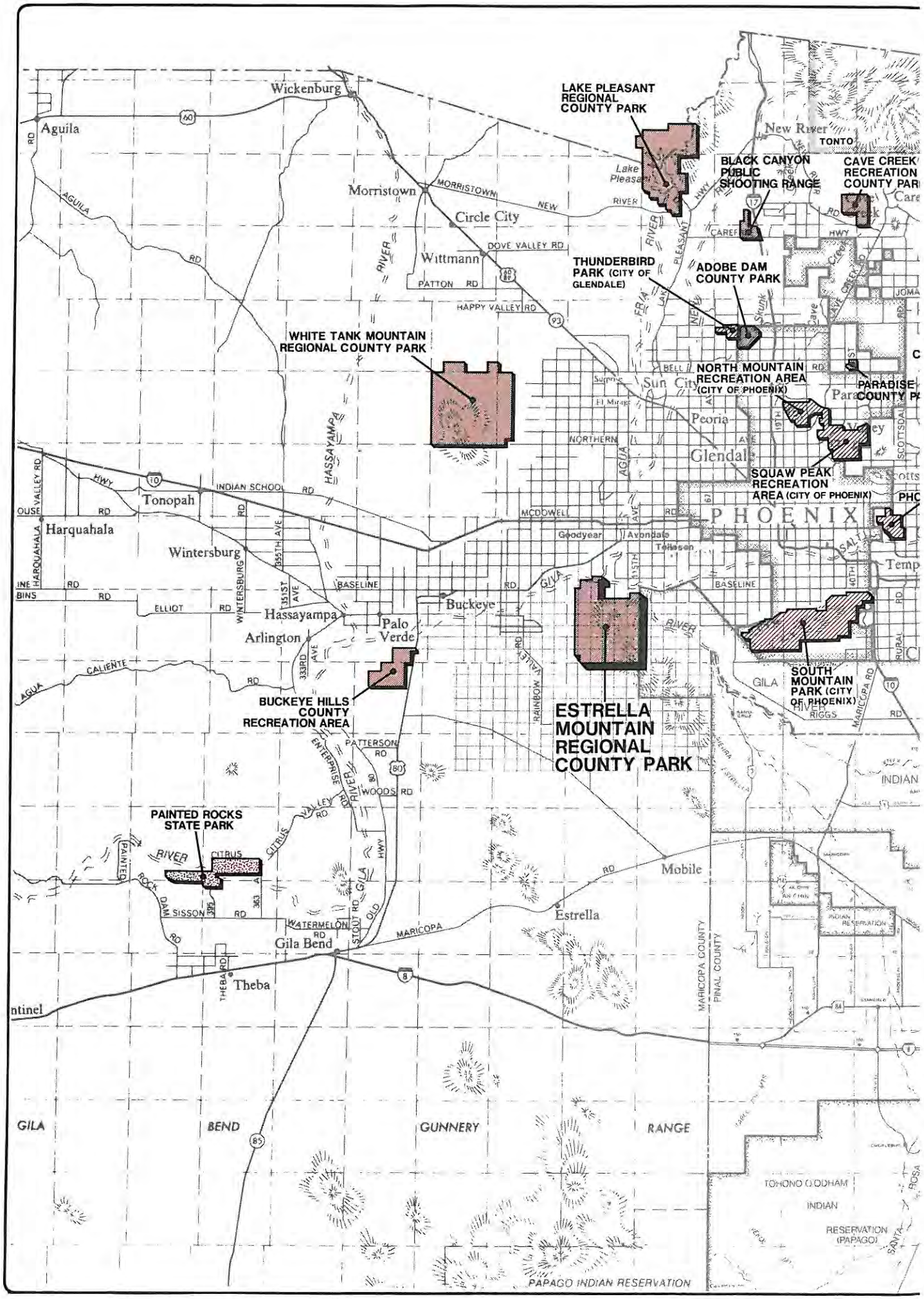
Each of these County regional parks have different recreation amenities and opportunities to offer but no other park holds more potential than Estrella Mountain Regional Park.

Estrella Mountain Regional Park, has the potential to surpass many of the other regional recreation facilities because of its location and its natural and historic features.

As mentioned earlier, the park is located at the confluence of three of the largest rivers in the state, the Salt, the Gila and the Agua Fria Rivers. More than one third of the state of Arizona drains to this confluence point via these three rivers and their tributaries. This river drainage system provides great potential for an open space and trail system both locally and on a regional scale. Estrella Mountain Regional Park would be a key location for such a trail system as a destination or starting point to destinations beyond.

Furthermore, significant trail connection opportunities also exist to the west and south of the park. Through Amcor's Estrella development to the west, a number of trail connections have already been planned and to the south opportunities exist into and through B.L.M. property. Estrella Mountain Regional Park already has excellent access off of I-10, and in addition, park access will benefit greatly from the construction of the Valley's outer loop transportation system. The western boundary of Estrella Mountain Regional Park is only one to two miles east of the proposed Jackrabbit Road alignment.

The rugged terrain and natural desert conditions in Estrella Mountain Regional Park are shared by the other County mountain parks, but the presence of the Gila River in the north end of the park provides potential that none of the other mountain parks in the valley can provide.


LAKE PLEASANT REGIONAL COUNTY PARK
BLACK CANYON PUBLIC SHOOTING RANGE
CAVE CREEK RECREATION COUNTY PARK
THUNDERBIRD PARK (CITY OF GLENDALE)
ADOBE DAM COUNTY PARK
WHITE TANK MOUNTAIN REGIONAL COUNTY PARK
NORTH MOUNTAIN RECREATION AREA (CITY OF PHOENIX)
PARADISE COUNTY PARK
SQUAW PEAK RECREATION AREA (CITY OF PHOENIX)
SOUTH MOUNTAIN PARK (CITY OF PHOENIX)
BUCKEYE HILLS COUNTY RECREATION AREA
ESTRELLA MOUNTAIN REGIONAL COUNTY PARK
PAINTED ROCKS STATE PARK
Wickenburg
Aguila
Morristown
Circle City
Wittmann
New River
Lake Pleasant
Peoria
Sun City
Glendale
PHOENIX
Tonopah
Harquahala
Wintersburg
Hassayampa
Arlington
Palo Verde
Buckeye
Goodyear
Avondale
Tolleson
Mobile
Estrella
Gila Bend
Theba
GILA BEND
GUNNERY RANGE
PAPAGO INDIAN RESERVATION
TOHONO O'ODHAM INDIAN RESERVATION (PAPAGO)
MARICOPA COUNTY
PINAL COUNTY

The potential water resources available and potential for water oriented activity is stronger in Estrella Mountain Regional Park than in any other mountain park in the valley.

The area within and immediately surrounding this park is also quite rich in historic and cultural sites. These resources are generally more extensive in Estrella Park than that occurring in any of the county's other parks. The County Parks and Recreation Department has the opportunity to preserve and help recover some potentially significant cultural resources.

The Regional Analysis describes the current setting, the existing and proposed jurisdictional boundaries and the specific regional recreational facilities. The purpose of the Regional Analysis is to describe the basic physical setting of the Estrella Mountain Regional Park and its relationships to different governmental jurisdictions.

2. Existing Conditions

The most dominant, natural feature of the Estrella Mountain Regional Park is the Sierra Estrella Mountain range of which almost one-third lies within park boundaries. Foothills of this range cross the park diagonally from the northwest to the southeast, increasing in elevation towards the southeast. The Sierra Estrella Mountain range continues southeastward beyond the park and through the Gila River Indian Reservation. Foothills or flat desert floor surrounds the park on the east, south and west, and to the north is the floodplain of the Gila River.

The neighboring planned community of Estrella on the western border of the park, currently in the initial stages of development, will have significant impacts upon Estrella Mountain Regional Park over the next fifteen to twenty years. Likewise, the existing agricultural fields and sparse residential areas to the north of the park towards Goodyear and Avondale will also experience significant growth and development in the near future and will in turn provide additional impact upon Estrella Mountain Regional Park (Figure 3).

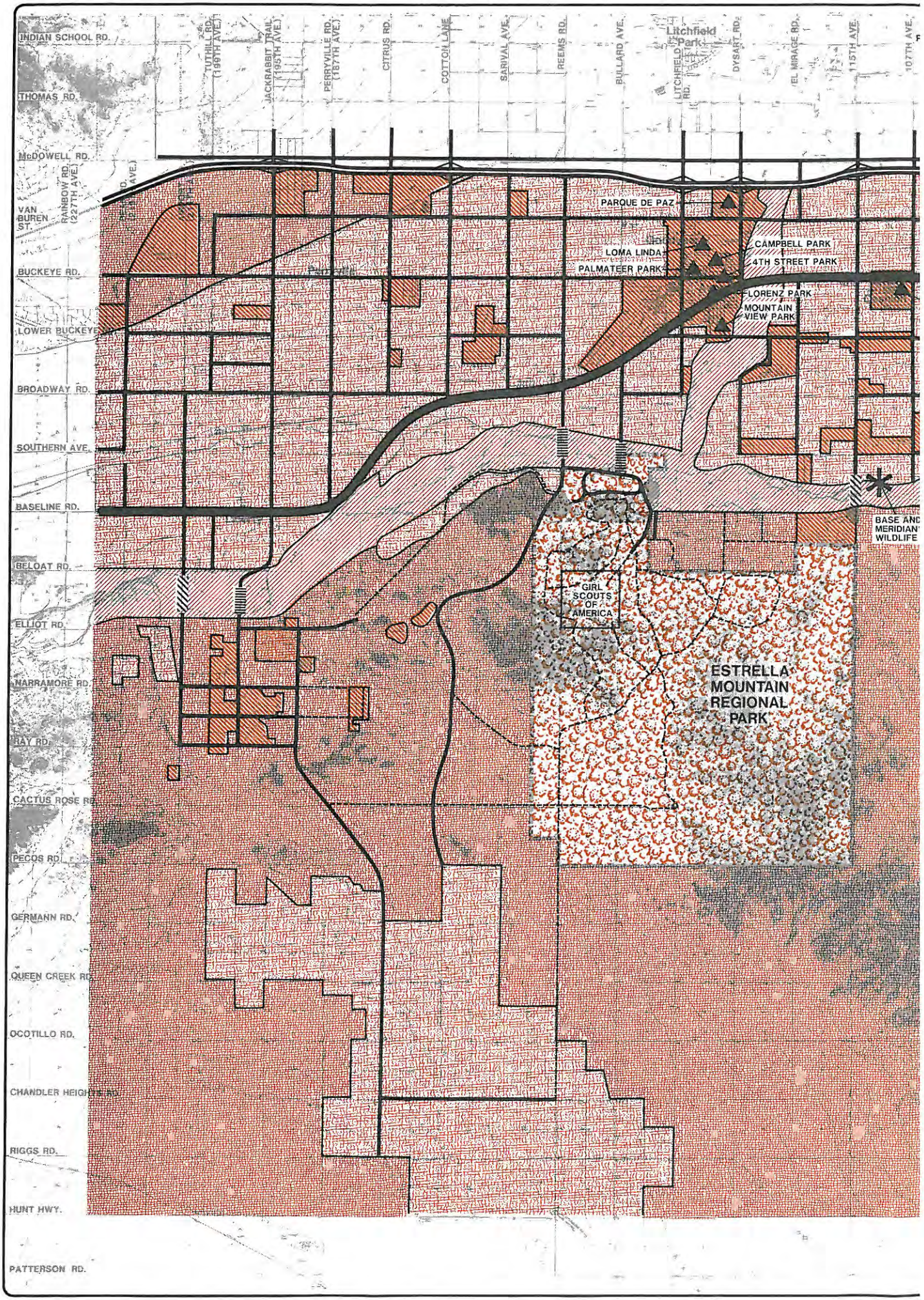
Access to Estrella Mountain Regional Park has recently been improved by roadway improvements to Bullard Avenue, and the construction of a new bridge and extension of Estrella Parkway (formerly Reems Road). Controlled entry into the park is currently limited to one point near the Bullard Avenue bridge (Figure 4). Some of the more rugged portions of the park remain unfenced allowing potential illegal access by four-wheel drive vehicles, all terrain vehicles, and motorcycles.

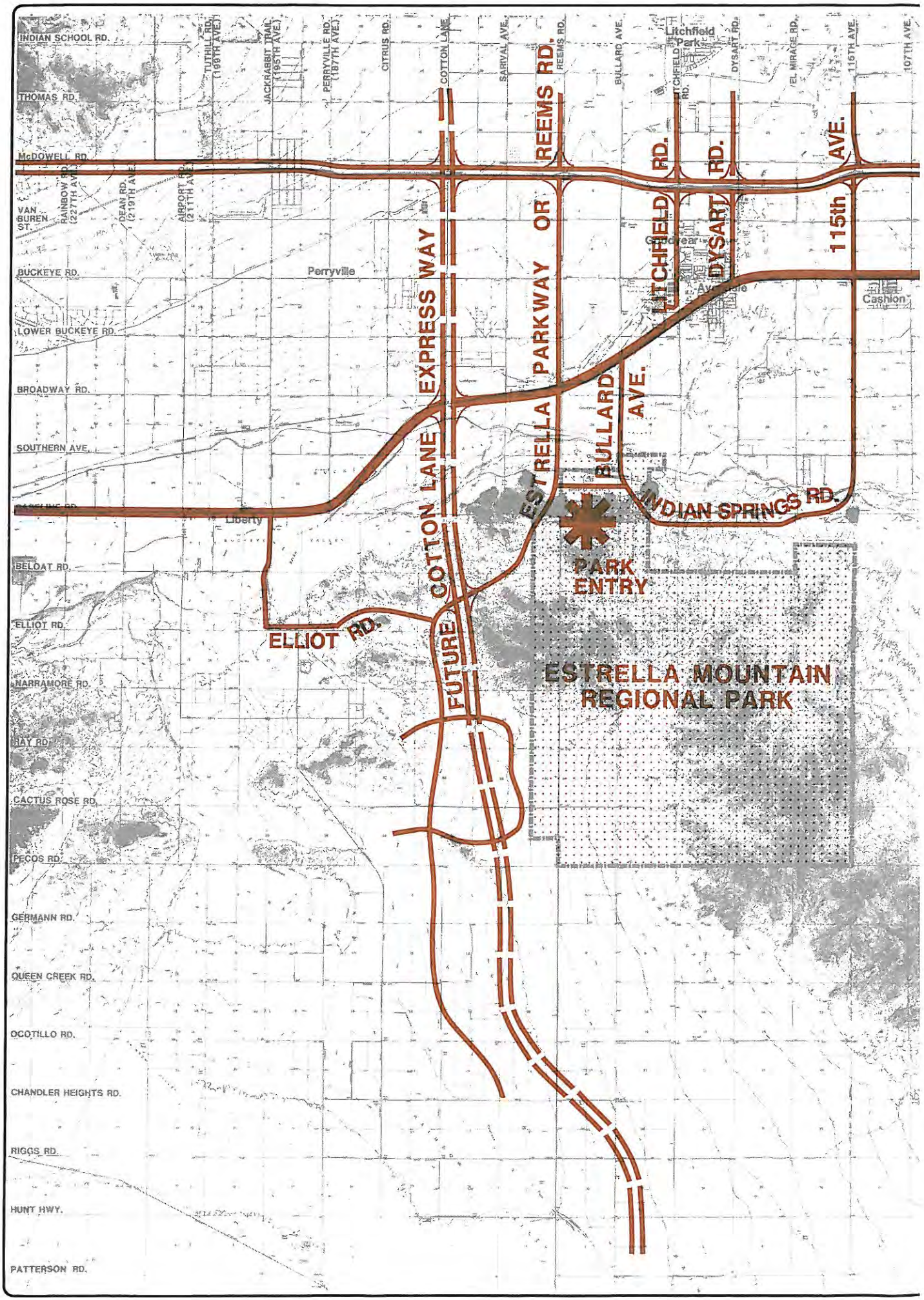
Physical Setting

Estrella Mountain Regional Park is located in an area of the Phoenix Metropolitan Area which has not seen any significant growth until the last 2-3 years. As Interstate 10 was opened in segments, there has been a realization that the southwest and west metropolitan area is now only 15-20 minutes from downtown Phoenix. The western suburbs are now experiencing enormous growth and this resultant growth can be seen by the

significant amount of annexation, planning and construction activity in the area.

Prior to this recent growth, the Estrella Mountain Regional Park was surrounded by undeveloped, unincorporated Maricopa County. Today, the City of Avondale is expanding southward and will eventually expand their municipal limits to coincide with the northern boundary of Estrella Mountain Regional Park. They are beginning the process of developing land use plans for this area now.


INDIAN SCHOOL RD.
THOMAS RD.
McDOWELL RD.
VAN BUREN ST.
BUCKEYE RD.
LOWER BUCKEYE
BROADWAY RD.
SOUTHERN AVE.
BASELINE RD.
BELOAT RD.
ELLIOT RD.
NARRAMORE RD.
HAY RD.
CACTUS ROSE RD.
PECOS RD.
GERMANN RD.
QUEEN CREEK RD.
OCOTILLO RD.
CHANDLER HEIGHTS RD.
RIGGS RD.
HUNT HWY.
PATTERSON RD.
RAINBOW RD. (227TH AVE.)
TUTHILL (190TH AVE.)
JACKRABBIT TRAIL (195TH AVE.)
PERRYVILLE RD. (187TH AVE.)
CITRUS RD.
COTTON LANE
SARIVAL AVE.
REEMS RD.
BULLARD AVE.
Litchfield Park
LITCHFIELD RD.
DYSART RD.
EL MIRAGE RD.
115TH AVE.
107TH AVE.
PARQUE DE PAZ
LOMA LINDA
PALMATEER PARK
CAMPBELL PARK
4TH STREET PARK
LORENZ PARK
MOUNTAIN VIEW PARK
BASE AND MERIDIAN WILDLIFE
GIRL SCOUTS OF AMERICA
ESTRELLA MOUNTAIN REGIONAL PARK


INDIAN SCHOOL RD.
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NARRAMORE RD.
HAY RD.
CACTUS ROSE RD.
PECOS RD.
GERMANN RD.
QUEEN CREEK RD.
OCOTILLO RD.
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RIGGS RD.
HUNT HWY.
PATTERSON RD.
RAINBOW RD. (227TH AVE.)
DEAN RD. (219TH AVE.)
AIRPORT RD. (211TH AVE.)
TUTHILL RD. (199TH AVE.)
JACKRABBIT TRAIL (195TH AVE.)
PERRYVILLE RD. (187TH AVE.)
CITRUS RD.
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REEMS RD.
BULLARD AVE.
Litchfield Park
LITCHFIELD RD.
DYSART RD.
EL MIRAGE RD.
116TH AVE.
107TH AVE.
115th AVE.
Perryville
Goodyear
Avondale
Cashion
Liberty
EXPRESS WAY
COTTON LANE
PARKWAY OR
ESTRELLA
BULLARD AVE.
LITCHFIELD RD.
DYSART
INDIAN SPRINGS RD.
PARK ENTRY
ELLIOT RD.
FUTURE
ESTRELLA MOUNTAIN REGIONAL PARK

American Continental's planned community of Estrella, along the western boundary of the Park, with its 20,000 acres and project population of some 200,000 people, will dramatically increase usage of the Park. Maricopa County has come under pressure to begin land use planning in the various unincorporated areas to prevent unplanned growth and coordinate infrastructure expansion and development.

The Planning Information Source graphic (Figure 5), illustrates the various planning efforts which have recently been completed or are still underway. It illustrates that the various public agencies in the region have realized that they must begin serious planning efforts for the increased growth which is projected for this area.

Political Jurisdiction

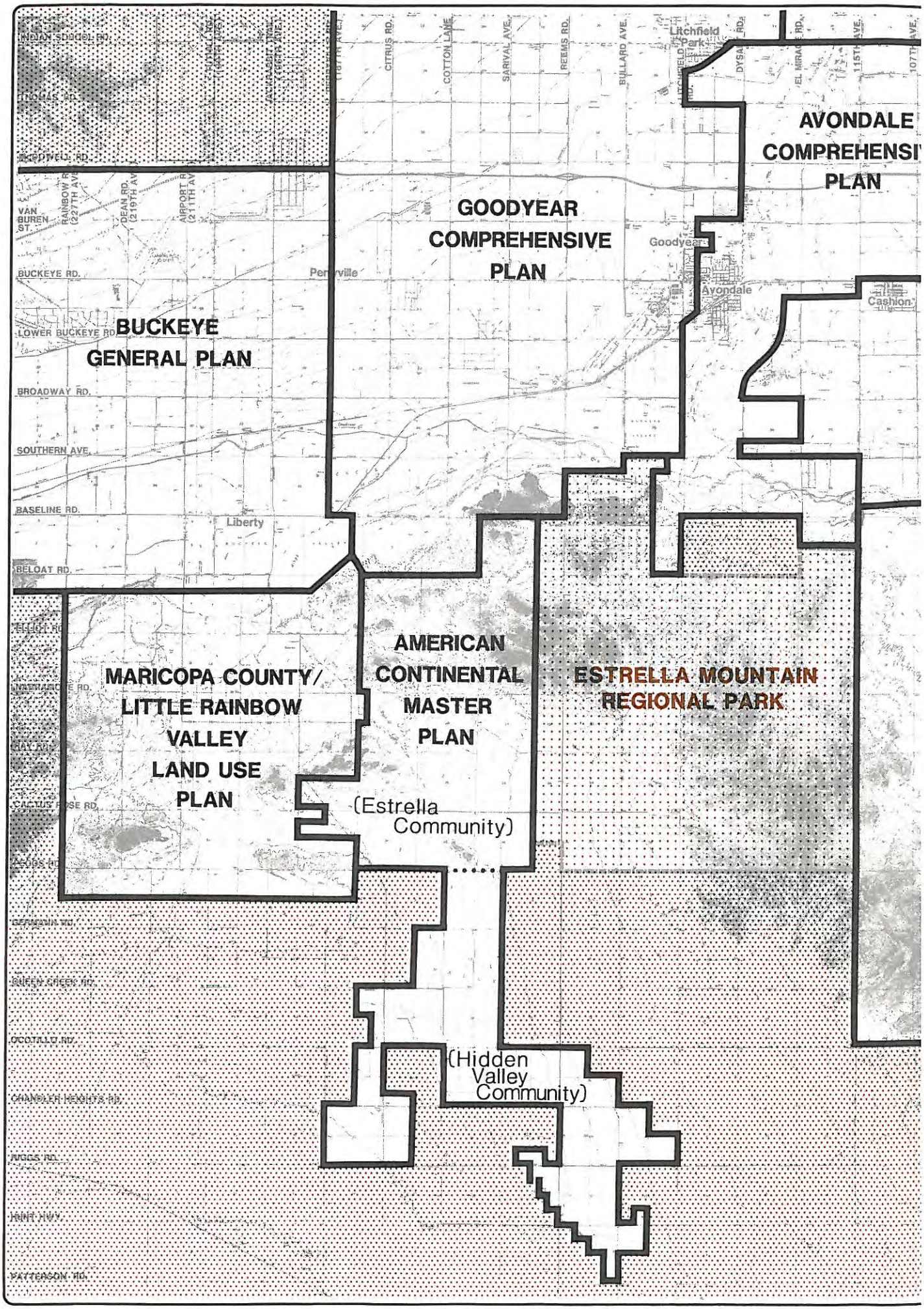
Recent annexations by the Town of Goodyear now include all property along the entire western boundary of the park as well as approximately 22 square miles of the 30 plus square miles of park property. Goodyear has now annexed all park property west of Litchfield Road and all park property north of Narramore Road including park property east of Litchfield Road. The Town of Avondale is expected to eventually annex all property between their current Town limits and the park. Agreements between Avondale and Goodyear will allow Avondale to also annex all property in the park east of Litchfield Road should Avondale choose to extend their jurisdiction. Park property east of Litchfield Road, currently annexed by Goodyear, will be deannexed at what ever time Avondale is ready to extend their Town limits into the park.

3. Proposed Land Use

As an outgrowth to the various planning efforts in the area, is the Proposed Land Use (Figure 6). The proposed land uses surrounding the park provide the basis for the master planning process and helps to visualize the magnitude of the projected growth and the changes most likely to occur in the surrounding communities.

In unplanned areas, public or private ownership has been indicated to identify the appropriate contact for specific plans on individual parcels. Publicly owned land by various State or Federal agencies have not gone through a planning process and are currently being utilized for grazing.

Land uses indicated identify the type of development that is planned to occur and are generalized to accommodate for the various categories utilized by each planning agency. Some municipalities are currently in the process of updating or changing their General Plans and other communities have just completed their General Plans. In either case, extensive planning and zoning work has been done in the communities to the north and west of the park and much of the ground work necessary for development to occur has been accomplished.


AVONDALE
COMPREHENSI
PLAN
GOODYEAR
COMPREHENSIVE
PLAN
BUCKEYE
GENERAL PLAN
MARICOPA COUNTY/
LITTLE RAINBOW
VALLEY
LAND USE
PLAN
AMERICAN
CONTINENTAL
MASTER
PLAN
ESTRELLA MOUNTAIN
REGIONAL PARK
(Estrella
Community)
(Hidden
Valley
Community)
Litchfield
Park
Goodyear
Avondale
Cashion
Perryville
Liberty
INDIAN SCHOOL RD.
THOMAS RD.
VAN
BUREN
ST.
BUCKEYE RD.
LOWER BUCKEYE RD.
BROADWAY RD.
SOUTHERN AVE.
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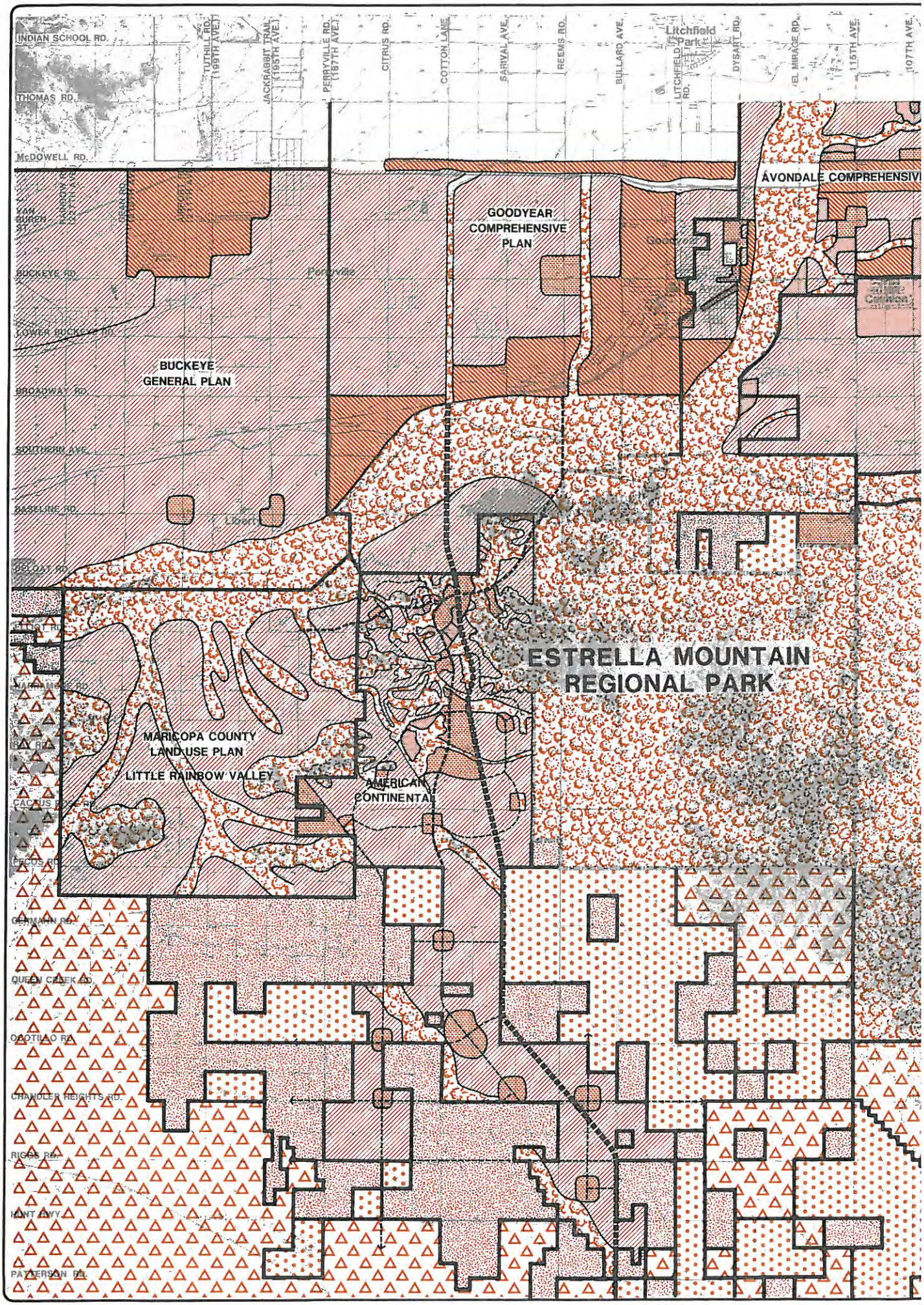
INDIAN SCHOOL RD.
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BROADWAY RD.
SOUTHERN AVE.
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DEL RAY RD.
CACTUS RD.
FRYE RD.
GERMANN RD.
QUEEN CREEK RD.
OCOTILLO RD.
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LITCHFIELD RD.
DYSART RD.
EL MIRAGE RD.
115TH AVE.
107TH AVE.
Litchfield Park
Goodyear
Perryville
Liberty
AVONDALE COMPREHENSIVE
GOODYEAR COMPREHENSIVE PLAN
BUCKEYE GENERAL PLAN
ESTRELLA MOUNTAIN REGIONAL PARK
MARICOPA COUNTY LAND USE PLAN
LITTLE RAINBOW VALLEY
AMERICAN CONTINENTAL

A major linear park and open space system is planned along the Gila and Salt Rivers, cutting east to west along the northern edge of the Estrella Mountain Regional Park. In addition, the Agua Fria riverway is also being planned as a major linear park and open space. This open space system has the potential to provide the backbone system of pedestrian, hiking, biking and horse trails throughout the area and provide a major secondary system by which park users can get to Estrella Mountain Regional Park. With major residential areas being planned for north and west of Estrella Mountain Regional Park, these major open space spines can easily be linked into the smaller residential scale trails and sidewalk systems.

While this open space corridor provides fantastic linkages to the various residential communities, it also provides a major buffer to the industrial use being planned directly to the north. The industrial development within Goodyear, north of Estrella Mountain Regional Park, will be a minimum of a mile from the northernmost park boundary.

The unplanned area immediately south of the Gila River and just north of Estrella Mountain Regional Park is currently sparsely developed. Most of this area has been subdivided for single family residential lots but a relatively small number of homes have been built. The density of residential development in this area is expected to remain low and, once built-out, will provide a good compatible land use.

The Gila River Indian Reservation to the east of the park plans to maintain the land adjacent to the park in its natural undisturbed condition. The most intense land use adjacent to the park would be agriculture and limited housing. The reservation does not plan any intensive development in the future. South of Estrella Mountain Regional Park is State and Federal property (Figure 7). The eastern half of the southern park boundary is common with BLM land and the western half of the boundary with Arizona State Lands. Neither agency has any specific development plans and the only current permits are for grazing. The BLM land will most likely remain undeveloped for the foreseeable future. State lands will probably be developed since pressure will be great both from developers, and from the State to increase its general education fund.

The desert landscape to the east and southeast of Estrella Mountain Regional Park is, therefore, most likely to remain untouched and pristine. The natural vegetation, wildlife and distant views of undisturbed desert conditions to the east and southeast could be utilized by the park as a significant scenic resource.

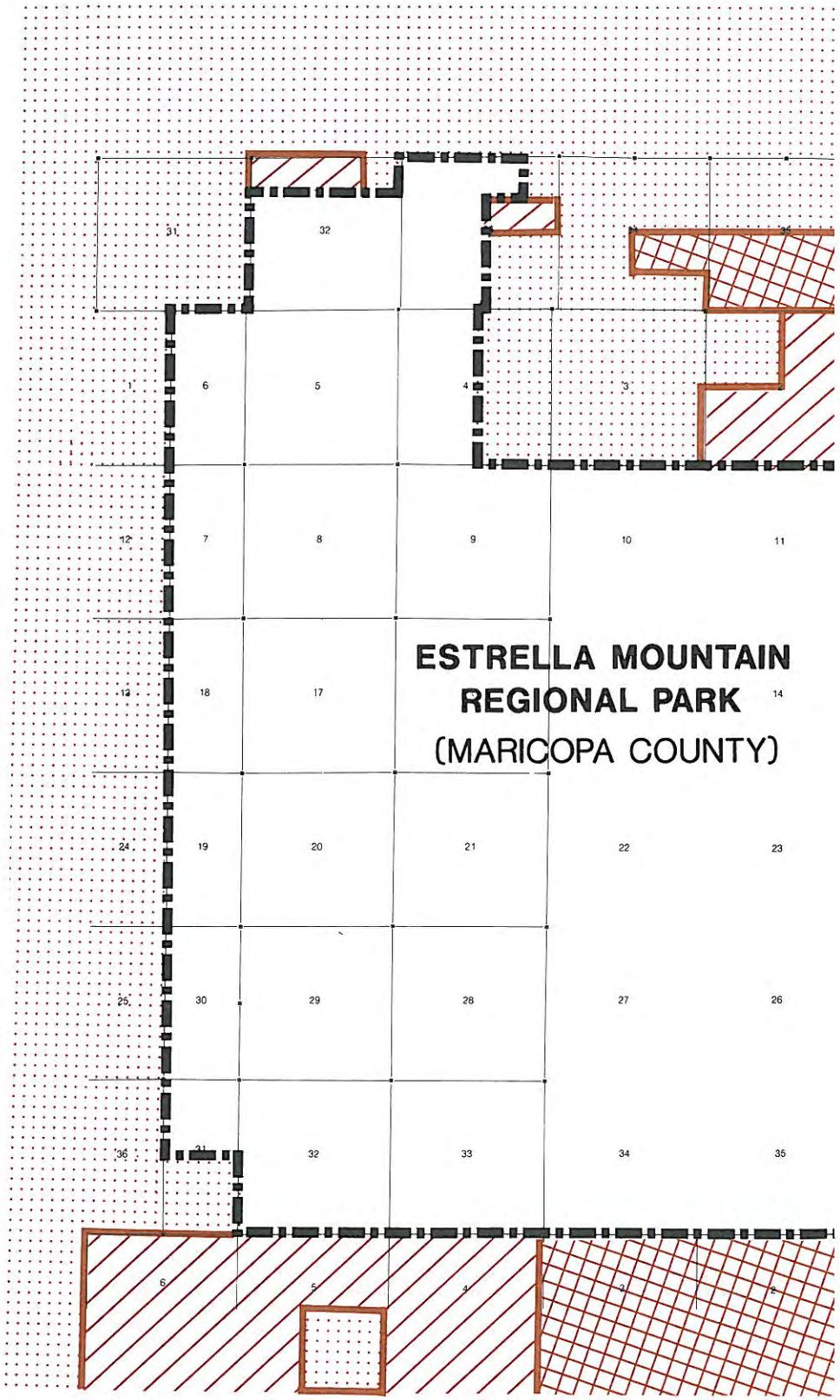
To the west of Estrella Mountain Regional Park is American Continental's Estrella Master Planned Community. This development shares the entire western boundary with Estrella Mountain Regional Park. Just north of the midpoint of this western park boundary, the foothills of the Sierra Estrella Mountain range extend into the Amcor Development. This rugged area has been designated by Amcor in their master plan as open space or as mountain preserve. Nearly one and one half miles of the western park boundary is then in common with land that, as planned, will remain in its current natural condition.

To the north of this open space area the Estrella development has been subdivided into large lot single family parcels. Construction of homes on those lots immediately adjacent to the park is expected to be underway by the middle of 1988. Included in this first phase of development is a golf course and resort center both located within one mile of the western park boundary. The northern Amcor development should not effect Estrella Mountain Regional Park to a great degree because of the generous amount of mountain preserve land, the low density housing and the rugged terrain to visually hide portions of the development from park users.

The greatest impact in this northern section is from the newly constructed Estrella Parkway. The alignment of Estrella Parkway crosses the northwest corner of Estrella Mountain Regional Park's property. Park property effected by this alignment amounts to approximately 38 acres. Approximately 10 acres were utilized for right-of-way and 28 acres of park property was isolated by Estrella Parkway. This isolated parcel would be rather difficult to utilize but would provide an opportunity for a possible land trade.

The southern portion of the western park boundary presents a slightly different situation. There is potential for a greater impact on Estrella Mountain Regional Park from the second phase of development. While the second phase is planned for predominantly single family residential areas, this phase will contain higher densities than the northern development. Because of the higher densities, larger amounts of developable land and the lack of topographic relief to visually separate development from park users, this area will have a visual impact on Estrella Mountain Regional Park. The vegetation along this southern portion of the western park boundary is also more sparse than other areas, so natural vegetation will not contribute much to buffering adjacent development. Amcor has planned for a number of open space corridors throughout their development and they also provide for numerous opportunities for possible linkages into Estrella Mountain Regional Park. The total Amcor development continues south of the Estrella Community to their Hidden Valley Community. This planned area extends nearly seven more miles south and actual development is expected to begin some time before Phase Two of the Estrella Community is completed.

If the southwest valley grows as expected over the next fifteen to twenty years many significant changes will occur in the communities surrounding Estrella Mountain Regional Park. The number and types of users that will soon be living in close proximity to Estrella Mountain Regional Park will increase dramatically. The context around the park has, of course, been undergoing change and growth since the park was created, but never at the rate or scale of change that will soon be experienced.


ESTRELLA MOUNTAIN
REGIONAL PARK
(MARICOPA COUNTY)

Land use information was obtained from the following official documents:

Maricopa County Land Use Plan
Little Rainbow Valley
BRW, Inc. and Sunregion Associates
17 February 1988

Comprehensive Plan for the City of Goodyear
Goodyear, Arizona
28 May 1985

Gila River Indian Community
Existing Land Use, Land Use Planning and Zoning
No Date on Plan
Also Information from Meeting with Cecil Antone and William Talbow

General Plan for Phoenix 1985-2000
Adopted by City Council 2 October 1985
Resolution #16697

Estrella Master Plan
American Continental
July and October 1986
and Sales Brochure 1988

and

Hidden Valley Master Plan
American Continental
23 February 1987

Maricopa County Land Use Plan
Laveen
BRW, Inc. and Sunregion Associates
November 1986

Estrella Comprehensive General Plan
Estrella Joint Planning Committee
BRW, Inc. and Sunregion Associates
12 March 1987

General Development Plan
Town of Buckeye Arizona
GWE, Inc. Planning Consultants
December 1981

Climate

Maricopa County has a desert-type climate. The relative humidity is low and the annual rainfall is just slightly over seven inches per year. Daytime temperatures throughout the summer are normally high, but winters are generally mild. Nighttime temperatures do drop below freezing during the three coldest months, but afternoons are commonly sunny and mild. The average daytime relative humidity, based on observation at 11:00 am and 5:00 pm at Phoenix Airport, is about 30 percent.

From early June until mid-September the afternoon maximum temperature commonly exceeds 100°F. According to records kept at Phoenix Airport, about 83 days per year have a maximum temperature of 100°F or higher. Phoenix Airport normally has 7 days per year when the maximum temperature is at least 110°F.

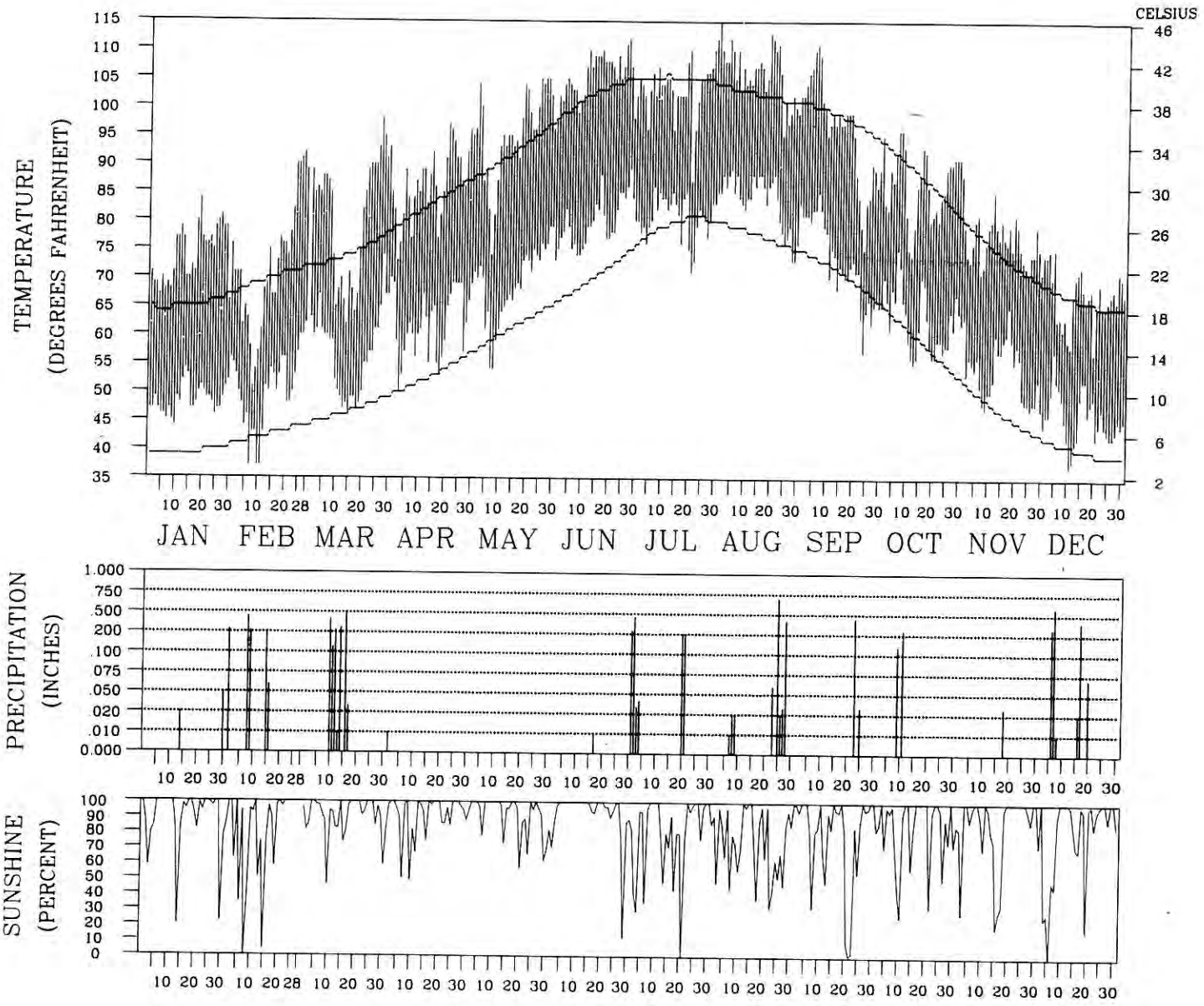
In late Spring and in early Summer, when the air is dry, the temperature normally varies by 40°F or more between early afternoon and daybreak, and evenings are moderately cool. In July and August, however, higher relative humidity sometimes holds minimum temperatures above 80°F. In Winter, minimum temperatures fall to 32°F or lower on an average of 29 days in Tempe, and on 44 days in Buckeye.

There are two separate precipitation seasons. The first occurs from November to March, when the area is subjected to occasional storms from the Pacific Ocean. The second rainfall season occurs in July, August, and most of September, when the region experiences widespread thunderstorm activity associated with moist air moving into Arizona from Baja and Mexico. These thunderstorms are extremely variable in intensity and location, and the heaviest amounts of precipitation occurs during these months. In some years, unusually heavy precipitation can occur near the end of summer due to a tropical disturbance moving northward from the Pacific Ocean.*

*Excerpts from the climate chapter of **Soil Survey of Maricopa County, Arizona-Central Part.** Prepared by the United States Department of Agriculture Soil Conservation Service in Cooperation with the University of Arizona Agricultural Experiment Station.

Local Daily Climatological Data

Phoenix, Arizona



TEMPERATURE DEPICTS NORMAL MAXIMUM, NORMAL MINIMUM AND ACTUAL DAILY HIGH AND LOW VALUES (FAHRENHEIT)
PRECIPITATION IS MEASURED IN INCHES, SCALE IS NON-LINEAR
SUNSHINE IS PERCENT OF THE POSSIBLE SUNSHINE

Source: National Oceanic and Atmospheric Administration

Normals, Means, and Extremes

Phoenix, Arizona

LATITUDE: 33°26'N LONGITUDE: 112°01' W ELEVATION: FT. GRND 1110 BARO 1109 TIME ZONE: MOUNTAIN WBAN: 23183

	(a)	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE °F:														
Normals														
-Daily Maximum		65.2	69.7	74.5	83.1	92.4	102.3	105.0	102.3	98.2	87.7	74.3	66.4	85.1
-Daily Minimum		39.4	42.5	46.7	53.0	61.5	70.6	79.5	77.5	70.9	59.1	46.9	40.2	57.3
-Monthly		52.3	56.1	60.6	68.1	77.0	86.5	92.3	89.9	84.6	73.4	60.6	53.3	71.2
Extremes														
-Record Highest	49	88	92	98	104	113	117	118	116	118	107	93	88	118
-Year		1971	1986	1986	1949	1984	1979	1958	1975	1950	1980	1980	1950	JUL 1958
-Record Lowest	49	17	22	25	32	40	50	61	60	47	34	25	22	17
-Year		1950	1948	1966	1945	1967	1944	1944	1942	1965	1971	1938	1948	JAN 1950
NORMAL DEGREE DAYS:														
Heating (base 65°F)		394	269	187	52	0	0	0	0	0	13	159	368	1442
Cooling (base 65°F)		0	20	51	142	376	645	846	772	588	273	27	6	3746
% OF POSSIBLE SUNSHINE	91	78	80	83	88	93	94	85	85	89	88	83	77	85
MEAN SKY COVER (tenths)														
Sunrise - Sunset	41	4.7	4.5	4.4	3.3	2.6	1.9	3.7	3.3	2.3	2.7	3.5	4.1	3.4
MEAN NUMBER OF DAYS:														
Sunrise to Sunset														
-Clear	49	13.8	12.7	14.4	17.3	21.1	23.3	16.3	17.5	21.8	20.4	17.4	15.2	211.3
-Partly Cloudy	49	6.9	6.7	8.0	7.1	6.3	4.5	10.3	9.7	5.2	6.1	6.2	6.2	83.2
-Cloudy	49	10.3	8.8	8.6	5.6	3.6	2.2	4.4	3.8	3.1	4.5	6.3	9.6	70.7
Precipitation .01 inches or more	47	3.9	3.9	3.6	1.8	0.9	0.7	4.3	4.8	3.0	2.7	2.5	3.8	35.7
Snow, Ice pellets 1.0 inches or more	49	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Thunderstorms	47	0.3	0.6	0.9	0.7	0.9	1.0	6.3	7.3	3.6	1.3	0.5	0.7	24.0
Heavy Fog Visibility 1/4 mile or less	49	0.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.*	0.2	0.5	1.6
Temperature °F														
-Maximum														
90° and above	26	0.0	0.2	1.7	8.6	22.7	29.2	30.9	30.8	27.1	13.7	0.4	0.0	1[illegible]
32° and below	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
-Minimum														
32° and below	26	4.1	1.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.0	8.4
0° and below	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AVG. STATION PRESS.(mb)	14	978.4	977.9	974.4	972.9	970.6	969.9	971.4	971.6	971.6	974.1	976.6	978.3	974.0
RELATIVE HUMIDITY (%)														
Hour 05	26	67	61	58	43	35	32	45	51	51	52	59	68	52
Hour 11 (Local Time)	26	46	39	35	23	18	17	29	33	32	31	37	47	32
Hour 17	26	32	27	24	16	13	12	20	23	23	23	28	34	23
Hour 23	26	57	49	44	29	22	20	33	38	39	42	50	58	40
PRECIPITATION (inches):														
Water Equivalent														
-Normal		0.73	0.59	0.81	0.27	0.14	0.17	0.74	1.02	0.64	0.63	0.54	0.83	7.11
-Maximum Monthly	49	2.41	2.23	4.16	2.10	1.06	1.70	5.15	5.56	4.23	4.40	3.04	3.98	5.56
-Year		1955	1944	1941	1941	1976	1972	1984	1951	1939	1972	1952	1967	AUG 1951
-Minimum Monthly	49	0.00	0.00	0.00	0.00	0.00	0.00	T	T	0.00	0.00	0.00	0.00	0.00
-Year		1972	1967	1959	1962	1983	1983	1947	1975	1973	1973	1980	1981	MAY 1983
-Maximum in 24 hrs	49	1.31	1.22	2.04	1.38	0.96	1.64	2.75	3.07	2.43	2.27	1.14	1.89	3.07
-Year		1951	1978	1983	1941	1976	1972	1984	1943	1970	1972	1978	1967	AUG 1943
Snow, Ice pellets														
-Maximum Monthly	49	T	0.6	T	T								0.1	0.6
-Year		1962	1939	1976	1949								1985	FEB 1939
-Maximum in 24 hrs	49	T	0.6	T	T								0.1	0.6
-Year		1962	1939	1976	1949								1985	FEB 1939
WIND:														
Mean Speed (mph)	41	5.2	5.8	6.7	7.0	7.1	6.9	7.2	6.7	6.4	5.9	5.4	5.2	6.3
Prevailing Direction through 1963		E	E	E	E	E	E	W	E	E	E	E	E	E
Fastest Obs. 1 Min														
-Direction (!!)	1	08	26	30	27	02	03	04	06	12	21	05	27	02
-Speed (MPH)	1	22	18	24	28	35	31	29	29	18	28	17	14	35
-Year		1986	1986	1986	1986	1986	1986	1986	1986	1986	1986	1986	1986	MAY 1986
Peak Gust														
-Direction (!!)	49	W	W	W	W	SSE	NE	SE	E	SW	W	W	W	SE
-Speed (mph)	49	60	54	51	49	59	73	86	78	75	61	60	68	86
-Date		1983	1980	1977	1981	1954	1978	1976	1978	1950	1981	1982	1953	JUL 1976

Source: National Oceanic and Atmospheric Administration

B. SITE ANALYSIS

Within the park, all pertinent natural and cultural resources were investigated, mapped and analyzed. The site analyses that follow provide a more indepth understanding of the park and its mountainous desert environment. Figure 16 highlights some of the more important considerations.

1. Physiography/Slope/Aspect

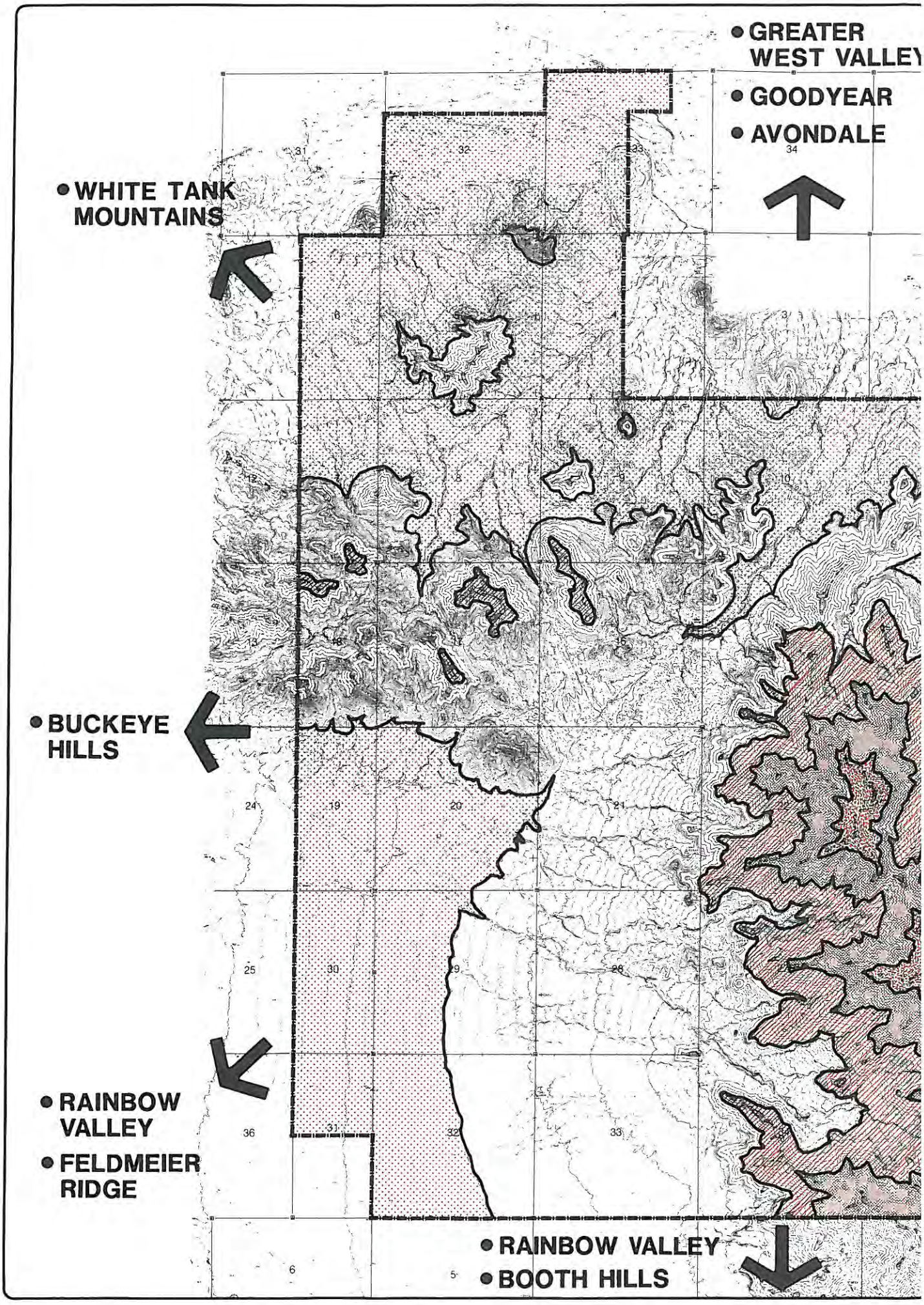
Within the park there are some very dramatic changes in elevation making topography one of the most significant resources of the park. From the lowest point in the park, the Gila River bed, to the highest peak within the park there is approximately a 2,800 foot change in elevation. Estrella Mountain Regional Park contains approximately one-third of the Sierra Estrella Range.

The highest point in the Sierra Estrella Range lies outside the park to the southeast within the Gila River Indian Reservation (Figure 8). Nevertheless, the highest ridge lines and many lower peaks within the park offer some spectacular, and very panoramic views, both of the surrounding desert and of the Phoenix Metropolitan Area. This park offers many different uninterrupted distant views of undisturbed desert as well as many beautiful small intimate desert and raparian scenes.

Estrella Mountain Regional Park is divided into four distinct areas based on its topographic character. The northwest portion of the park contains many lower but still rugged foothills. This area is bisected by numerous small washes. The washes in the western portion of this area eventually all merge at one point at the southwestern edge of the existing golf course. This drainage must then be diverted around the golf course and piped under Vineyard Road in order to empty into the Gila River. Therefore, a very large volume of water often flows through the golf course at a concentrated time. Further development will affect this occurrence according to the intensity of development.

The northeast portion of the park is also made up of primarily lower rugged foothills, however, one peak in this area does reach 2,900 feet of elevation or 2,000 feet above the Gila River bed. This area is drained by three large, basically parallel washes, all draining to the northeast, each creating a distinct raparian community before they exit the park.

The southeast area contains the highest, most rugged terrain in the park. There are virtually no large flat areas within this area. The slope and aspect analysis help illustrate these extremes in topography (Figures 9, 10). The southwest area of the park is the only flat expanse within the park boundaries. This area is visually "table top" flat, broken only by Corgett Wash and its tributaries. This flat expanse functions to greatly accentuate the steep mountain terrain that vaults abruptly out of the desert floor when looking to the east.


• GREATER WEST VALLEY
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• AVONDALE
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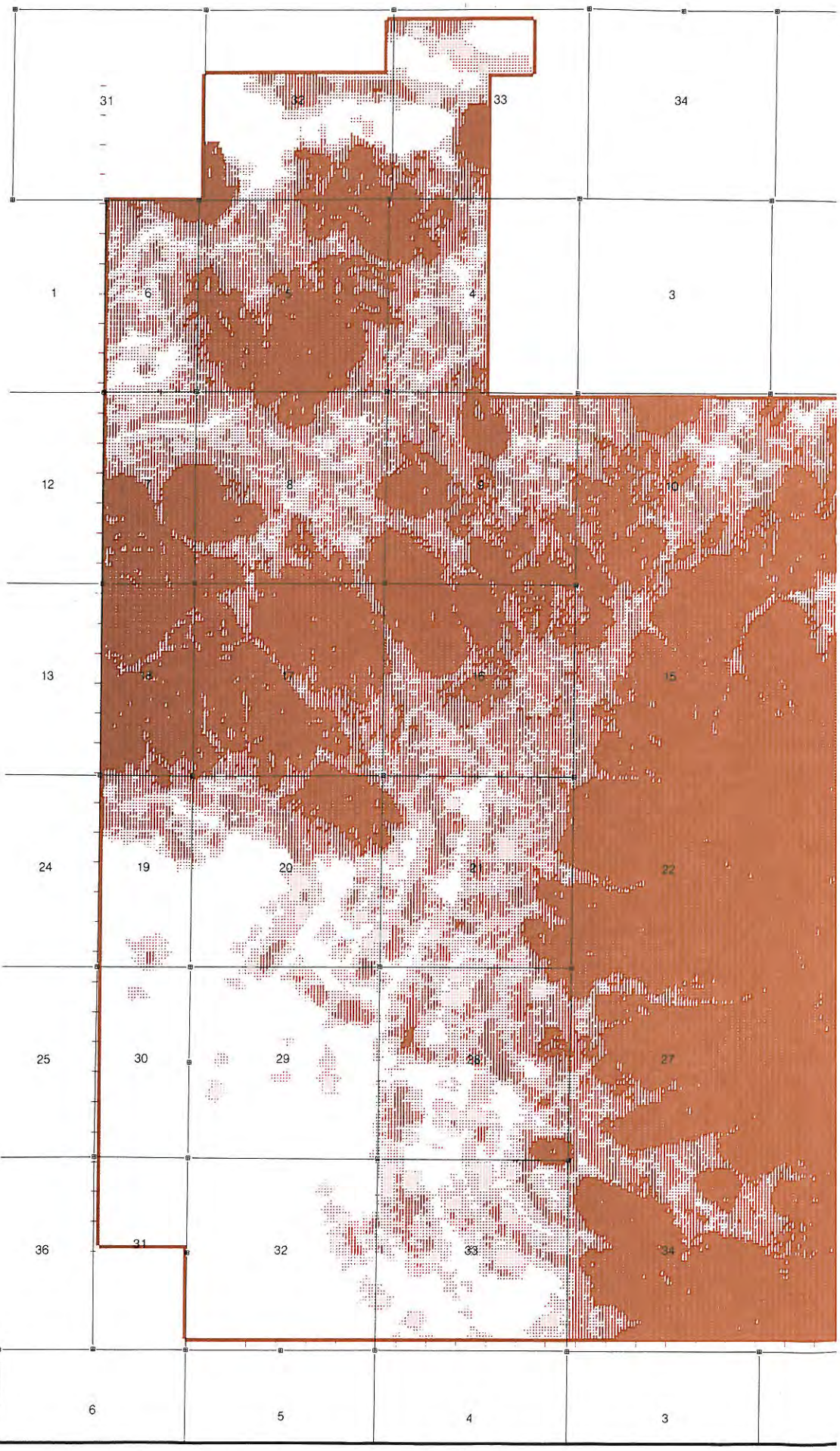
• RAINBOW VALLEY
• FELDMEIER RIDGE
• RAINBOW VALLEY
• BOOTH HILLS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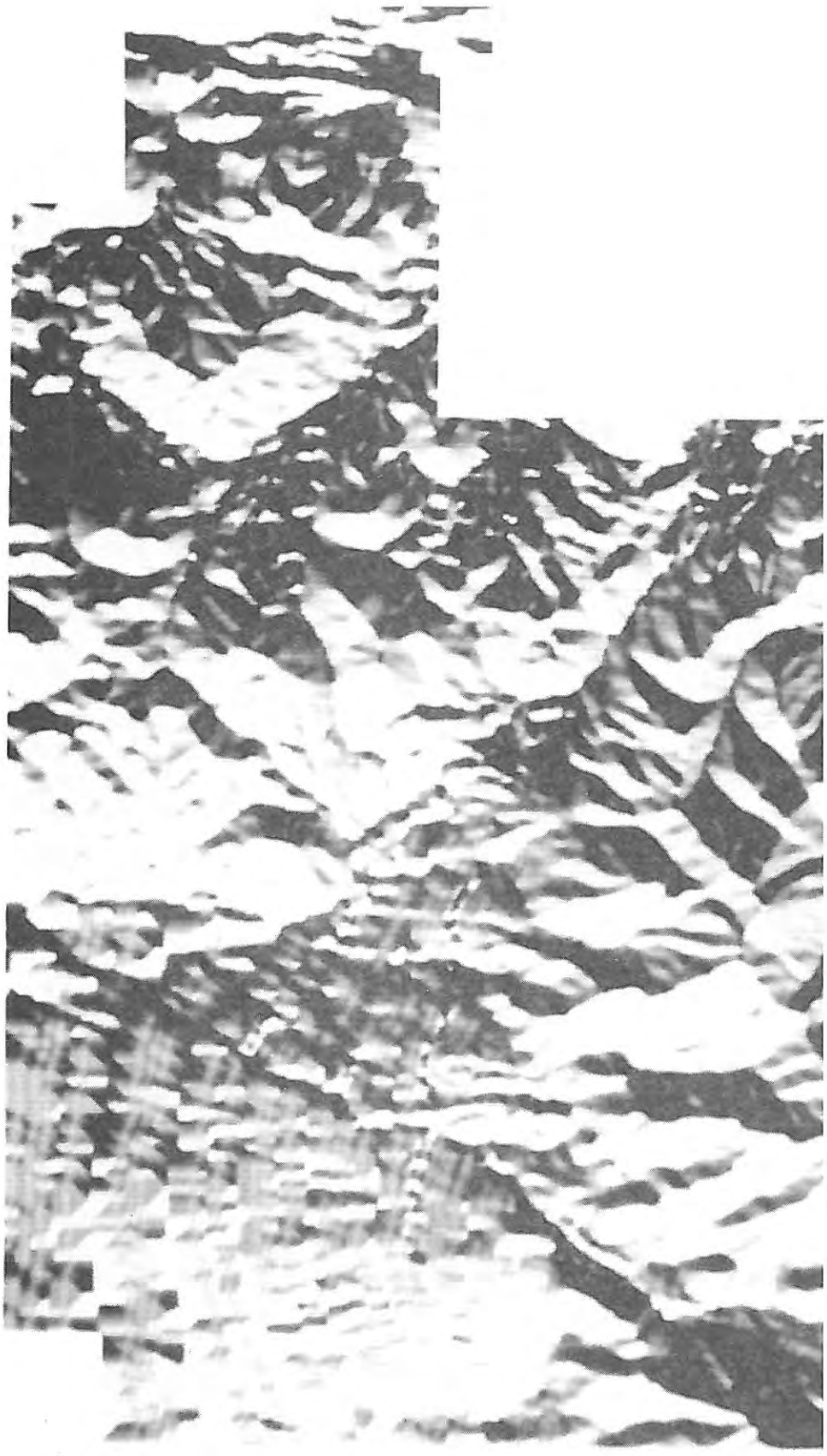


2. Drainage Analysis

The major washes within the park are draining either to the north or the northwest, eventually draining into the Gila River. The most significant wash within the park is Corgett Wash draining approximately nine (9) square miles of park land.

All of the washes are located on soils and within topography which is represented by fast run-off. These soils are very shallow lying over bedrock. With an annual rainfall of between 6-8 inches per year when ever a major rainstorm does occur there will be significant amounts of run-off. Potential locations for all activities and activity areas should be specifically looked at in respect to run-off. The small drainage ways in storm conditions will become fast, sometimes torrential moving water.

3. Vegetation Analysis

The following analysis is based on site visitation as well as previous studies and extrapolation of data. The analysis was divided into nine major categories (seven shrubs and plants and two tree categories), as follows:

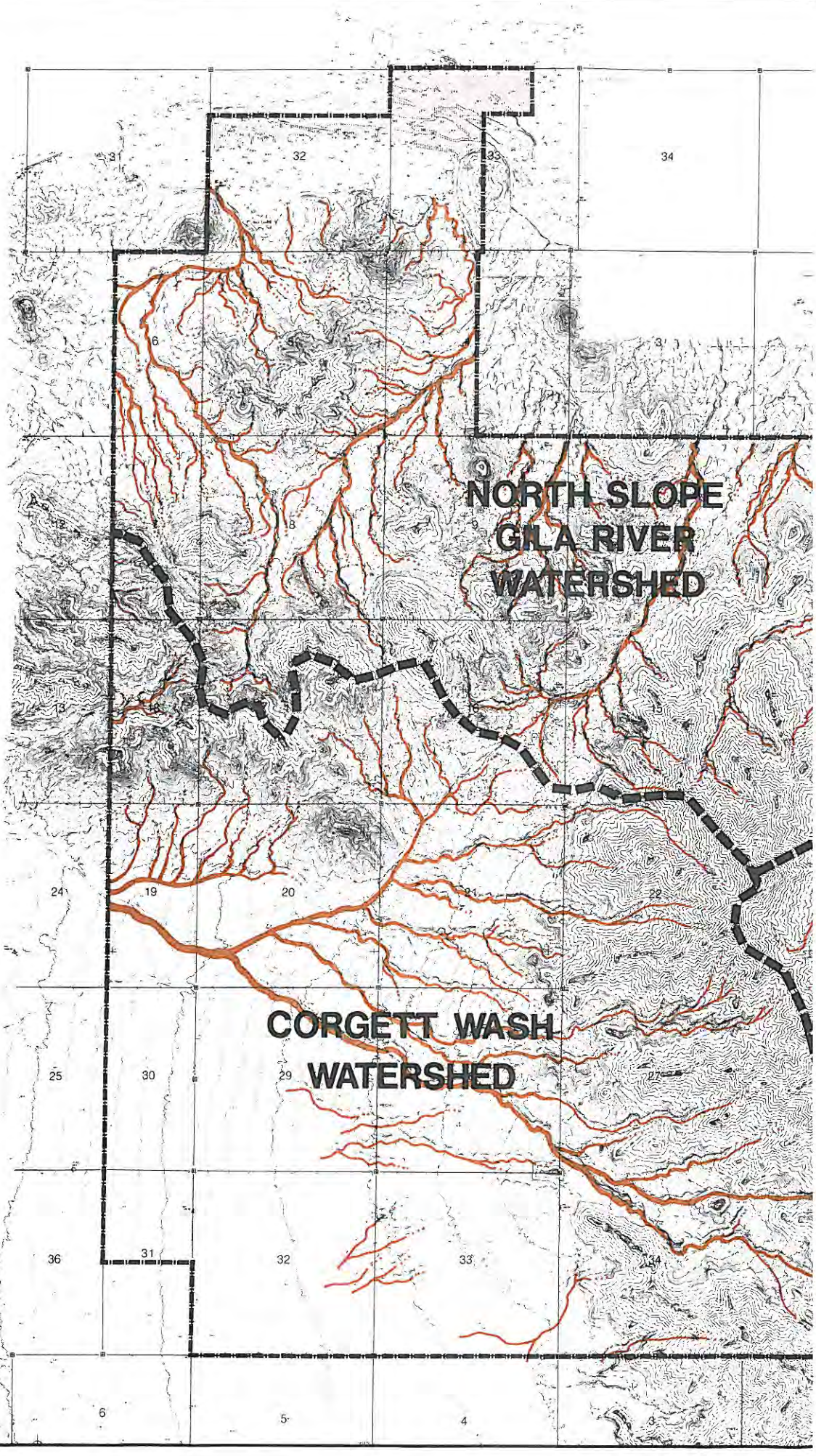
SHRUBS

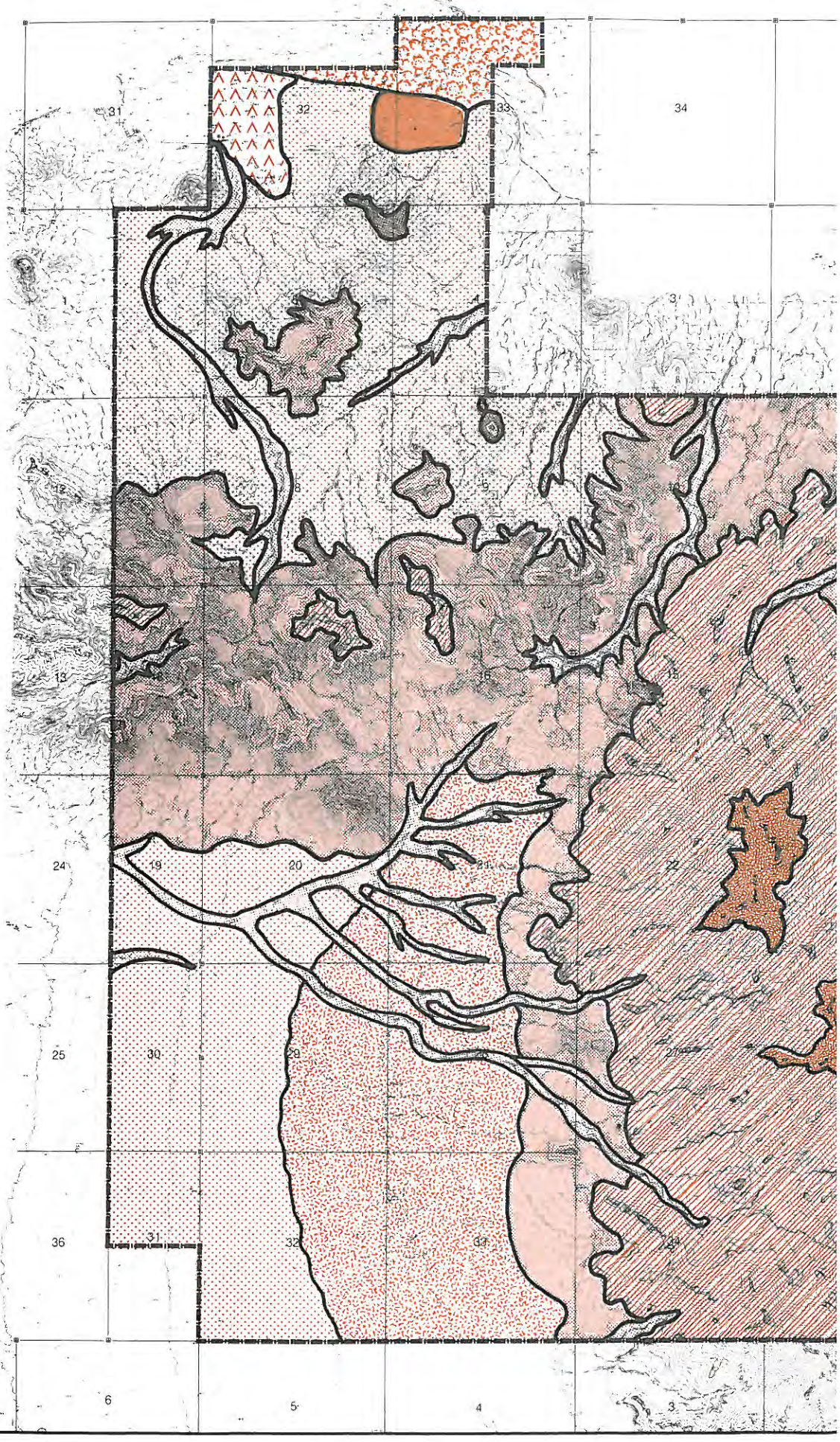
1.	River Bottom	0'-950'
2.	Riparian Washes	1000'-1650'
3.	Low Desert	1150'-1200'
4.	Lush Desert	1200'-1300'
5.	Desert Foothills	1300'-1400'
6.	Slopes	1400'-2400'
7.	High Desert	2400'-up

TREES

8.	Turf and Native Trees	950'-1000'
9.	Turf and Arid Domestic Trees	950'-1000'

One special status plant which may be found within the park is the Night-Blooming Cereus Cactus (Cereus Greggii). This cactus grows on desert flats and bajadas, often growing entwined with Creosote Bush or other desert shrubs. This species is likely to be found within the southwestern portion of the park, and is included by the U.S. Fish and Wildlife Service in Category 2, which means that the plant is in jeopardy of being eliminated unless recovery efforts are made. For a more detailed description of the specific plants associated with Estrella Mountain Regional Park refer to the Vegetation Distribution matrix.


NORTH SLOPE
GILA RIVER
WATERSHED
CORGETT WASH
WATERSHED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VEGETATION DISTRIBUTION

(By Elevation)

Table #1

SCIENTIFIC NAME	COMMON NAME	River Bottom 0'-950'	Riparian Washes 1000'-1650'	Low Desert 1150'-1200'	Lush Desert 1200'-1300'	Desert Foothills 1300'-1400'	Slope 1400'-2400'	High Desert 2400'-up	Turf & Native Trees 950'-1000'	Turf & Arid Domestic Tr. 950'-1000'
Ephedra Nevadanensis Varaspera	Nevada Tea; Morman Tea; Boundry Ephedra Brigham Tea		●	●	●	●	●	●		
Ephedra Trifurca	Mexican Tea							●		
Yucca Elata	Palmilia; Soap-weed; Soap Tree Yucca						●	●		
Agave Deserti	Amaryllis Family; Desert Agave; Desert Century Plant	●	●	●	●	●	●	●	●	●
Celtis Pallida	Elm Family; Desert Hackberry Granjeno						●	●		
Atriplex Lentiformis	Goosefoot Family Quail Brush; Lens Scale; White Thistle	●	●	●	●	●	●	●	●	●
Atriplex Linearis	Narrow-Leaf; Salt Bush							●		
Atriplex Polycarra	Desert Salt Bush; Cattle Spinach; All Scale; Sage Sage Brush	●	●	●	●	●	●	●	●	●
Crossosoma Bigelovii	Crossosoma Family; Crossosoma						●	●		
Acacia Greggii	Cat Claw; Devil's Claw; Cat Claw Acacia; Una de Gato							●		

VEGETATION DISTRIBUTION

(By Elevation)

Table #1 Continued

SCIENTIFIC NAME	COMMON NAME	River Bottom 0'-950'	Riparian Washes 1000'-1650'	Low Desert 1150'-1200'	Lush Desert 1200'-1300'	Desert Foothills 1300'-1400'	Slope 1400'-2400'	High Desert 2400'-up	Turf & Native Trees 950'-1000'	Turf & Arid Domestic Tr. 950'-1000'
Calliandra Eriophylls	Fairy Duster; Huajillo; False Mesquite		●	●	●	●	●	●		
Cercidium Floridum	Blue Paloverde			●	●	●	●	●		
Cercidium Microphyllum	Foothill Palo-verde; Little Leaf Paloverde; Yellow Paloverde	●	●	●	●	●	●	●	●	●
Coleogyne Ramosissima	Black Brush							●		
Krameria Grayi	White Ratany	●	●	●	●	●	●	●	●	●
Krameria Parvifolia	Ratany; Range Ratany	●	●	●	●	●	●	●	●	●
Olneya Tesota	Desert Ironwood; Palo Fierro; Palo-de-Hierro	●	●	●	●	●	●		●	●
Prosopis Juliflora	Western Honey Mesquite; Honey Mesquite; Mesquite	●	●	●	●	●	●	●	●	●
Prosopis Juliflora	Velvet Mesquite	●	●	●	●	●	●		●	●
Larrea Tridentata	Caltrop Family Creosote Bush	●	●	●	●	●	●	●	●	●

VEGETATION DISTRIBUTION

(By Elevation)

Table #1 Continued

SCIENTIFIC NAME	COMMON NAME	River Bottom 0'-950'	Riparian Washes 1000'-1650'	Low Desert 1150'-1200'	Lush Desert 1200'-1300'	Desert Foothills 1300'-1400'	Slope 1400'-2400'	High Desert 2400'-up	Turf & Native Trees 950'-1000'	Turf & Arid Domestic Tr. 950'-1000'
Holocantha Emoryi	Smarouba Family; Crucifixion Thorn; Corona de Cristo	●	●	●	●	●	●		●	●
Bursera Microphylla	Torchwood Family Elephant Tree; Torote; Copal			●	●	●	●	●		
Bernardia Incana	Spurge Family						●	●		
Condolia Lycioides	Buckthorn Family; Southwestern Concolia; Jujube			●	●	●	●	●		
Opuntia Engelmannii	Desert Prickly Pear			●	●	●	●	●		
Opuntia Phaeacantha	Purple Fruited Prickly Pear			●	●	●	●	●		
Opuntia Chlorotica	Clock-face Prickly Pear; Pan-cake Pear; Silver Dollar Cactus			●	●	●	●	●		
Opuntia Acanthocarpa	Buckhorn Cholla	●	●	●	●	●	●	●	●	●
Opuntia Bigelovii	Jumping Cholla; Teddy Bear Cholla Teddy Bear Cactus					●	●	●		
Opuntia Fulgida	Smooth Chain Fruit Cholla							●		

VEGETATION DISTRIBUTION

(By Elevation)

Table #1 Continued

SCIENTIFIC NAME	COMMON NAME	River Bottom 0'-950'	Riparian Washes 1000'-1650'	Low Desert 1150'-1200'	Lush Desert 1200'-1300'	Desert Foothills 1300'-1400'	Slope 1400'-2400'	High Desert 2400'-up	Turf & Native Trees 950'-1000'	Turf & Arid Domestic Tr. 950'-1000'
Opuntia Leptocaucis	Desert Christmas Cactus							●		
Peniocereus Greggii	Sweet Potato Cactus; Night Blooming Cereus	●	●	●	●	●	●	●	●	●
Carnegiea Gigantea	Saguaro; Giant Cactus					●	●	●		
Echinocereus Englmanni	Strawberry Hedgehog							●		
Echinocereus Fendleri	Fendler's Hedgehog							●		
Ferocactus Acanthodes	Compass Barrel Cactus; Calif. Barrel Cactus	●	●	●	●	●	●	●	●	●
Ferocactus Covillei	Coville's Barrel Cactus						●	●		
Ferocactus Wizuzeni	Candy Barrel Cactus; Fishhook	●	●	●	●	●	●	●	●	●
Mammillaria Fasciculata	Clustered Pincushion Cactus				●	●	●	●		
Fouquieria Splendens	Ocote; Ocotillo Coachwhip; Sumwood				●	●	●	●		

VEGETATION DISTRIBUTION

(By Elevation)

Table #1 Continued

SCIENTIFIC NAME	COMMON NAME	River Bottom 0'-950'	Riparian Washes 1000'-1650'	Low Desert 1150'-1200'	Lush Desert 1200'-1300'	Desert Foothills 1300'-1400'	Slope 1400'-2400'	High Desert 2400'-up	Turf & Native Trees 950'-1000'	Turf & Arid Domestic Tr. 950'-1000'
Menodora Scabra	Menodora						●	●		
Asclepias Subulata	Rush Milkweed; Desert Milkweed	●	●	●	●	●	●	●	●	●
Aloysia Wrightii	Verbena Family						●	●		
Salvia Mohavensis	Mojave Sage	●	●	●	●	●	●	●	●	●
Lycium Andersoni	-							●		
Lycium Fremontii	-							●		
Lycium Macrodon	-							●		
Lycium Pallidum	Pale Lycium							●		
Lycium Torreyi	Torrey Lycium		-	●	●	●	●	●		
Penstemon Microphyllus	Bush Pentstemon							●		

VEGETATION DISTRIBUTION

(By Elevation)

Table #1 Continued

SCIENTIFIC NAME	COMMON NAME	River Bottom 0'-950'	Riparian Washes 1000'-1650'	Low Desert 1150'-1200'	Lush Desert 1200'-1300'	Desert Foothills 1300'-1400'	Slope 1400'-2400'	High Desert 2400'-up	Turf & Native Trees 950'-1000'	Turf & Arid Domestic Tr. 950'-1000'
Beloperone Californica	California Beloperon	●	●	●	●	●	●	●	●	●
Aplopappus Laricifolious	Turpentine Bush							●		
Baccharis Sarothroides	Desert-Broom; Broom Baccharis; Rosin-Brush		●	●	●	●	●	●		
Pluchea Sericea	Arrow weed	●	●	●	●	●	●	●	●	●
Encelia Farinosa	Green Brittle Bush; Brittle Bush; Incienso	●	●	●	●	●	●	●	●	●
Franseria Ambrosioides	Canyon Ragweed			●	●	●	●	●		
Franseria Deltoidea	Bur sage; Rabbit Sage	●	●	●	●	●	●	●	●	●
Franseria Dumosa	White Bur Sage; Burrow weed	●	●	●	●	●	●	●	●	●
Hymenoclea Monoctyra	Burro Brush	●	●	●	●	●	●	●	●	●

4. **Wildlife**

The Arizona Game and Fish Department developed the first list of threatened wildlife in Arizona in 1975 and revised it in 1978, as new information was developed. The current list identifies animals generally characterized by: 1. Small populations in Arizona that are often substantially reduced from historic levels; and 2. occurrence in threatened habitats.

The wildlife is divided into four (4) groups showing the degrees of threat in and probability of extinction within Arizona.

Group 1: Animals are those known or suspected to have been extinct within Arizona but which still exist elsewhere.

Group 2: Animals are those whose continued presence in Arizona is now in jeopardy and extinction from the state is highly probable if no recovery efforts are made. This group includes some species for which there are no recent verified records; they, too, may have already been extinct within Arizona (e.g. Black-footed Ferret).

Group 3: Animals are those whose continued presence in Arizona could be in jeopardy in the foreseeable future. Serious threats exists to the habitats they occupy and their populations (a) have declined or (b) are limited to few individuals in few locations (e.g. most of our native fish).

Group 4: animals are those for which there is a moderate threat to the habitats they occupy. Given an increase in the degree of habitat threat or documentation of population declines, these species will be good candidates for Group 3 (e.g. Desert Massasauga).

Amphibians and Reptiles

Group 1: None

Group 2: Gila Monster (Hecodera Suspectum)-They are found on rocky mountain slopes, foothills, canyons and Bajadas. May be found in the eastern half of the park.

Group 3: Desert tortoise (Gopherus Agassizii)-Occurs in Rocky Foothills primarily, less than ten in lower Bajadas and on flats. Habitat characteristically Sonoran Desert and semi-desert grassland.

Group 4: None

Birds

Group 1: None

Group 2: Southern Bald Eagle (Haleaeetus Leucocephalus Leucocephalus)-Fewer than 15 nests known along the Salt and Verde Rivers and one at Torock Marsh. Threatened by habitat alteration caused by construction of dams.

Group 3: None

Group 4: Black-bellied Whistling Duck (Dendrocygna Autumnalis Fulgens)-Breeds in southeastern Arizona to Tucson and Phoenix. Depends on man-made ponds, following destruction of natural habitat (marshes).

Mammals

Group 1: None

Group 2: None

Group 3: Desert Big Horn (Ovis Canadensis Mexicana)-Occurs in mountains of southern and southwestern Arizona. Some populations greatly reduced or extinct.

The "Arizona Mohave" Draft Wilderness Environmental Impact Statement (prepared by U.S. Dept. of the Interior BLM Arizona 9/87) points out that 15-20 resident Bighorn roam the entire Sierra Estrella Range. Creating a hospitable environment within the park by providing them with watering holes could attract them into the park more often and for longer periods of time.

Group 4: None

The Arizona Game and Fish Department provided the design team with the latest information currently available regarding the nongame data management system.

The Sierra Estrella Mountains provide habitat for the Desert Tortoise (Gopherus Agassizii) and the Gila Monster (Hecodera Suspectum). These species are included in category 2 of the U.S. Fish and Wildlife Service as being considered for listing under the Endangered Species Act. The tortoise is also included in Group 3 of the Arizona List of Threatened Native Wildlife in Arizona (See copy in Appendix).

Within the Sonoran Desert the Tortoise and the Gila Monster are found on Rocky Mountain slopes, foothills, canyons and Bajadas. Both may be found within the park especially in the eastern half of the park.

Just outside the existing park's boundary along the Gila River, the Yuma Clapper Rail (Rallus Longirostris Yumaensis) has been recorded. This species is listed Endangered under the Endangered Species Act and is included in Group 3 of the Threatened Native Wildlife in Arizona. The Yuma Clapper lives in dense cattail and sedge marshes. Its presence along this section of the Gila River is periodic and depends on local wetland conditions.

5. Soil Analysis

Soil analysis of the park is important for understanding site conditions and the general suitability for development. For planning purposes, individual soil types have been classified under general soil associations as shown in Figure 13. A description of each of these associations and of each individual type of soil is included in this section.

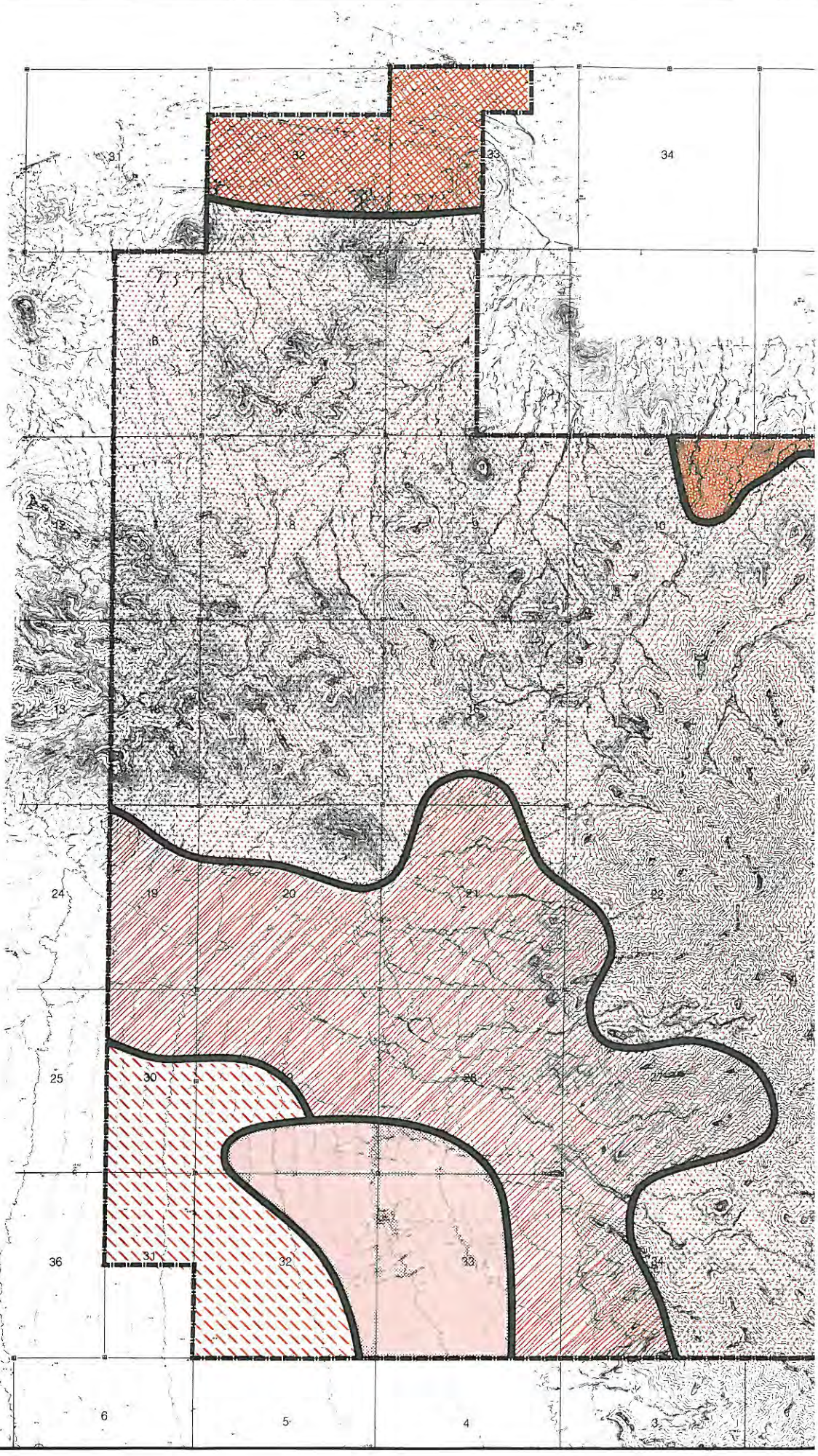
a. General

- Soils Formed in Old Alluvium
  - Rillito-Gunsight-Perryville Association: Nearly level to moderately steep gravelly loams, and loams on old alluvial fans and valley plains.
  - Laveen-Coolidge Association: Nearly level sandy loams, and clay loams on old alluvial fans and valley plains.
  - Ebon-Pinant-Tremant Association: Nearly level to gently sloping gravelly loams, very cobbly loams; and gravelly clay loams on old alluvial fans at the base of the mountains.
- Soils Formed in Young Alluvium
  - Antho-Valencia Association: Nearly level sandy loams on recent alluvial fans and valley plans.
  - Carrizo-Brios Association: Nearly level to gently sloping gravelly sandy loams and sandy loams in stream channels and on low stream terraces.
- Soils of Mountains and Buttes
  - Cherioni-Rock Outcrop Association: Gently sloping to very steep, very gravelly loams and rock outcrop on mountains, buttes and low hills.

b. Soils Formed in Old Alluvium

This group of associations consists of nearly level to moderately steep soils in old alluvium on alluvial fans and valley plains.

- Rillito-Gunsight-Perryville Association: This association is on old alluvial fans and valley plains, mainly in the western part of the survey area. Some areas are near the base mountains, but others are as much as ten (10) miles away. The undulating landscape is dissected by many stream channels that have cut one (1) foot to twenty (20) feet below the surface. The soils formed in old gravelly alluvium that was derived mainly from granitegneiss, schist,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andesite, and limestone. The natural vegetation is mainly creosotebush and scattered mesquite and paloverde trees. The elevation ranges from 800 to 1,400 feet.

This association makes up about 16 percent of the survey area. It is about 25 percent Rillito soils, about 20 percent Gunsight soils, about 10 percent Perryville soils, and 45 percent Pinal, Laveen, Harqua, and Cherioni soils. One area south of Saddle Mountain is almost entirely Pinal soils.

Rillito soils are on the more gently sloping edges of alluvial fans and valley plains. Gunsight soils are in the slightly higher positions in the center of alluvial fans. Perryville soils are in slightly lower positions along the outer margins of the alluvial fans and valley plains.

Rillito soils have a surface layer of light yellowish-brown loam about 10 inches thick. The underlying material to a depth of 19 inches is light-brown gravelly loam and pinkish-white to very pale brown gravelly loam or gravelly sandy loam to a depth of 60 inches. The underlying material contains soft masses, filaments, and concretions of lime.

Gunsight soils have a surface layer of light-brown and pale-brown gravelly loam about 3 inches thick. The underlying material to a depth of 60 inches is light-brown very gravelly loam. The underlying material contains soft masses and concretions of lime and in some profiles is cemented with lime.

Perryville soils have a surface layer of very pale brown gravelly loam about 9 inches thick. The underlying material is very pale brown gravelly loam or very gravelly sandy loam. The profile is extremely calcareous.

- Laveen-Coolidge Association: This association is on alluvial fans and valley plains that are 2 to 5 miles from the mountains. The largest area is a 3- to 5-mile wide area extending from Avondale to the Hassayampa River. A few smaller areas are in the Rainbow and Harquahala Valleys. The soil formed in alluvium that was derived from granitegneiss, schist, limestone, andesite, rhyolite, and basalt. The native vegetation is creosotebush and scattered mesquite and paloverde trees. The elevation ranges from 800 to 1,400 feet.

  This association makes up about 9 percent of the survey area. It is about 60 percent Laveen soils, 20 percent Coolidge soils, and 20 percent Mohall, Perryville, Tremant, Antho, Maripo, Rillito, and Gilman soils.

Laveen soils are at the lower ends of alluvial fans and on valley plains. Coolidge soils are in or near stream channels and at the upper ends of alluvial fans nearest the mountains.

Laveen soils are loams that have soft masses and concretions of lime below a depth of about 24 inches. Coolidge soils are sandy loams that have soft masses and a few concretions of lime below a dept of about 24 inches.

Parts of the towns of Buckeye and Avondale are on this association. Cotton, alfalfa, small grains, safflower, sugar beets, and grapes are the main crops. A few areas are used as range.

- Ebon-Pinamt-Tremant Association: This association is on old alluvial fans at the base of the White Tank and Estrella Mountains. It is dissected by numerous stream channels that are entrenched 2 to 25 feet below the surface. The soils formed in old gravelly alluvium that was derived from a wide mixture of granite, granite-gneiss, schist, rhyolite, andesite, and quartzsite. The natural vegetation is creosotebush, bursage, cactus, and scattered mesquite and paloverde trees. The elevation ranges from 800 to 1,800 feet.

  This association makes up about 3 percent of the survey area. It is about 30 percent Ebon soils, 20 percent Pinamt soils, 15 percent Tremant soils, and 35 percent Carrizo, Gunsight, Rillito, Chaerioni, and Antho soils.

  Ebon soils are at the upper ends of alluvial fans nearest the mountains, Pinamt soils are about halfway down the alluvial fans, and Tremant soils are at the lower ends.

  Ebon soils have a cobbly clay subsoil. Pinamt soils have a subsoil of very gravelly sandy clay loam. The underlying material is very gravelly sandy loam. The underlying material and lower part of the subsoil contain accumulations of lime. Tremant soils have a gravelly clay loam and clay loam subsoil. The underlying material is gravelly loam.

  Parts of South Mountain Park, White Tank Regional Park, and Estrella Mountain Regional Park are on this association. The association is not cultivated. A few areas are used as range.

c. Soils Formed in Young Alluvium

This group of associations consists of nearly level soils in young alluvium on alluvial fans, valley plains and stream channels.

- Antho-Valencia Association: This association is on young alluvial fans and valley plains that are 1 mile to 5 miles from the mountains. The native vegetation is creosotebush, cactus, annual weeds and grasses, and scattered mesquite and paloverde trees. The elevation ranges form 800 to 1,400 feet.

  Antho soils are sandy loam 40 inches deep or more. They are in the center of most mapped areas, and Valencia soils are along the margins. Valencia soils are sandy loam or fine sandy loam 20 to 39 inches deep over an old buried clay loam soil.

- Carrizo-Brios Association: This association is in or adjacent to the river channels of the New River, and the Gila, Salt Agua Fria and Hassayampa rivers and on a few of the adjacent low-lying stream terraces. The soils formed in recent alluvium that was derived from a wide mixture of acid and basic igneous and metamorphic rock. They are flooded occasionally. The native vegetation is salt-cedar, arrowweed, creosotebush, and saltbush. The elevation ranges from 750 to 1,300 feet.

  Carrizo soils are typically in the lowest positions nearest to the present stream channels.

  Carrizo soils have a surface layer of yellowish-brown gravelly sandy loam about 5 inches thick over pale brown very gravelly coarse sand that extends to a depth of 60 inches or more. Brios soils have a surface layer of brown sandy loams about 14 inches thick over brown sand that extends to a depth of 60 inches or more.

d. Soils of Mountains and Buttes

This association consists of Rock outcrop and areas of shallow soils in steep mountainous areas.

- Cherioni-Rock Outcrop Association: This association is in steep mountainous areas and in less sloping areas at their base. Slopes are complex. The largest area in Eagletail Park and the Saddle, Estrella, and Salt River Mountains. The soils formed over granite-gneiss, schist, andesite, basalt, and tuff bedrock. Minor amounts of silt are deposited on these soils by the wind. The vegetation consists of creosotebush, bursage, cactus, and scattered mesquite and paloverde trees. The elevation ranges from 800 to 4,500 feet.

  This association makes up about 11 percent of the survey area. It is 40 percent Cherioni soils, 35 percent Rock outcrop, and 25 percent Gunsight, Pinal, Gachado, and several shallow soils.

Cherioni soils are on the lower slopes of mountains and on a few pediments and low hills. Rock outcrop is scattered throughout most mapped areas of this association but is more prevalent in the highest parts of mountains and on low hills. Cherioni soils are very gravelly loams about 11 inches thick. They have a physically hardened hardpan about 7 inches thick over bedrock.

Part of the city of Phoenix is on this association, as well as parts of South Mountain Park, White tank Regional Park, Estrella Mountain Regional Park, and buckeye Hills Regional Park. Several television and radio transmitters and water tanks are in the higher lying areas, and parts of two heavy equipment proving grounds are also in these areas. This association is not cultivated. A few areas are used for range.

TABLE 4: SOILS LEGEND

Symbol	Name
A. Casey Abbott area	
Bs	Brios Sandy Loam
CO	Cherioni-Rock outcrop Complex
CA_2	Caliorthids and Torriorthents, eroded
EPD	Ebon-Pinamt Complex, 0-10 percent slopes
GWD	Gunsight-Pinal Complex, 1-10 percent slopes
PT	Pinal gravelly loam
RS	Rock outcrop-Cherioni Complex
B. Girl Scout Parcel	
CO	Cherioni-Rock outcrop Complex
EPD	Ebon-Pinamt Complex, 0-10 percent slopes
GA	Gachado-Rock outcrop Complex
GWD	Gunsight-Pinal Comples, 1-10 percent slopes
RS	Rock outcrop-Cherioni Complex
C. The Balance of the Park	
AGB	Antho-Carrizo Complex, 0-3 percent slopes
AL	Antho Association
CO	Cherioni-Rock outcrop Complex
CV	Coolidge-Laveen Association
EPD	Ebon-Pinamt Complex, 0-10 percent slopes
GgA	Gilman Loam, 0-1 percent slopes
GWD	Gunsight-Pinal Complex, 0-10 percent slopes
GYD	Gunsight-Rillito Complex, 0-10 percent slopes
PRB	Perryville-Rillito Complex, 0-3 percent slopes
PT	Pinal gravelly loam
PYD	Pinamt-Tremant Complex, 1-10 percent slopes
RS	Rock outcrop-Cherioni Complex
TB	Torrifluvents
TSC	Tremant-Rillito Complex, 0-5 percent slopes

e. Description of the Soils

This section describes each soil series in detail, and in alphabetical order.

- Antho association (AL) - This nearly level to gently sloping mapping unit is on alluvial fans that radiate out from nearby mountains. It occurs throughout the uncultivated part of the survey area, but is most extensive at the base of the Estrella Mountains in the Rainbow Valley. Slopes are generally less than 1 percent. Runoff is slow, and the erosion hazard is slight. A few slopes near stream channels are nearly 3 percent. On these, runoff is medium and erosion hazard is moderate. Surface drainage is provided by an irregular branching pattern of shallow stream channels, 1 foot to 3 feet deep, spaced at 50- to 300-foot intervals. Areas are somewhat pear shaped and range from 100 to 900 acres in size. The unit is grazed. None of the acreage is cultivated.

- Brois sandy loam (Bs) - this soil is on low terraces near the major drainageways and on alluvial fans. It occurs throughout th survey area. The surface is somewhat hummocky. Slopes are less than 1 percent. Areas are long and narrow and about 10 acres in size.

- Calciorthids and Torriorthents, eroded (CA2) - This soil is in long, narrow areas at the steep edges of old alluvial fans and old stream terraces that slope abruptly down to recent stream terraces and flood plains below. The difference in elevation from the top to the bottom is generally more than 20 percent, but less than 80 feet. Slopes range from 15 to 40 percent. Areas are sharply dissected by arroyos that are commonly at right angles to the long axis of mapped areas. Calciorthids and Torriorthents, eroded, run parallel to and are one-eighth to one-fourth mile from the main stream channels.

  Calciorthids and torriorthents, eroded, is highly variable remnants of old soils that were derived from mixed acid and basic igneous and some sedimentary rocks. It ranges from loamy sand to clay loam, is 35 to 85 percent gravel and cobbles, and is mainly very calcareous. Stones are on the surface in some areas. Included in mapping in some more gently sloping areas are small areas of Gunsight or Pinal soils. They make up less than 10 percent of the mapping unit. Calciorthids and Torriorthents, eroded, provide a source of gravel and road fill, and some are used for grazing.

- Cherioni-Rock outcrop Complex (CO) - This soil unit is on low hills and the lower slopes of mountains. It is dissected by low stream channels that have cut 3 to 20 feet below the surface. These channels are 50 to 200 feet

apart. Gravel, cobbles, and stones cover 50 to 90 percent of the surface. Slopes are complex and range from 3 to 25 percent.

The cherioni soil is on the lower slopes of mountains and low hills, and Rock outcrop is on the upper slopes. This soil is in similar positions to those of the Cherioni soil. Also included are areas of Cachado very gravelly clay loam, Pinal soils, Gunsight soils and Rillito soils. These included soils seldom make up more than 30 percent of the mapping unit. This unit provides grazing.

- Ebon-Pinamt complex, 0 to 10 percent slopes (EPD) - This nearly level to moderately steep unit is on old alluvial fans that form a piedmont slope along the base of the White Tank Mountains. Most fans are 1 mile to 2 miles long. The unit is dissected by intermittent stream channels spaced at 50 to 500-foot intervals that have cut 2 to 30 feet below the surface. Slopes range from 1 to 3 percent, but many short slopes near washes are nearly 10 percent. Areas range from 100 to 500 acres in size.

  This unit is about 40 percent an Ebon gravelly loam, 25 percent a Pinamt gravelly sandy loam, and 20 percent a Tremant gravelly loam. These soils have profiles similar to the ones described as representative of their respective series, but the Pinamt soil has a surface layer of gravelly sandy loam and the Tremant soil has a surface layer of gravelly loam. The Ebon soil is in the highest positions nearest the mountains and along the edge of intermittent stream channels. About 60 to 90 percent of the surface area is covered with granite-gneiss gravel and cobbles. The Pinamt soil is at the lower ends of alluvial fans. About 30 to 80 percent of the surface area is covered with granite-gneiss gravel and cobbles. The Tremant soil is in the center of alluvial fans. About 25 to 45 percent of the surface area is covered with granite-gneiss gravel and cobbles.

  Included with this unit are small areas of Gunsight gravelly loam, 1 to 3 percent slopes; Carrizo gravelly sandy loam, 1 t 3 percent slopes; Rillito loam, 1 to 3 percent slopes; and Antho sandy loam, 1 to 3 percent slopes. Also included are a few small areas of soils that are similar to Ebon soils, but they have a physically hardened lime hardpan at a moderate depth. Included soils make up about 15 percent of this mapping unit. This mapping unit is used mainly for grazing. It is not cultivated.

- Gachado-Rock outcrop Complex (GA) - This moderately steep unit is on lower slopes of low hills and mountains in the Rainbow and Harquahala Valleys. Slopes generally range from 5 to 10 percent, but in a few areas are more than 10 percent. The surface area is dissected by shallow stream channels spaced 40- to 200-foot intervals.

This unit is about 40 percent Gachado very gravelly clay loam and about 40 percent Rock outcrop. Rock outcrop is in random, circular about 20 to 100 feet in diameter. It is surrounded by the Gachado soil.

Included with this unit are areas of Cherioni very gravelly loam and a few small areas of Rillito, Pinal and Gunsight soils. These soils make up about 20 percent of this mapping unit. This unit is used for range and wildlife.

- Gilman loam, 0 to 1 percent (GgA) - This nearly level soil is on stream terraces, valley plains and alluvial fans. It occurs throughout the survey area. Area are generally long and narrow and are parallel to stream channels. They are about 30 acres in size.

  This soil has the profile described as representative of the series. This Gilman soil is used mainly for cotton, alfalfa, barley, sorghum, safflower, sugar beets, grapes, citrus, and vegetables. In areas not cultivated, it is used as range.

- Gunsight-Pinal complex, 1 to 10 percent slopes (GWD) - This gently sloping to moderately steep unit is on old alluvial fans in the western part of the survey area. It is dissected by drainageways, 2 to 15 feet deep, at 50- to 300-foot intervals. About 30 to 70 percent of the surface area is covered with angular cobbles and gravel and a few stones. Slopes are mainly about 3 percent, but some of the larger alluvial fan tops are nearly 1 percent and some short slopes along drainageways are nearly 10 percent.

  This unit is about 40 percent a Gunsight cobbly loam, 30 percent a Pinal gravelly loam, and 12 percent a Pinamt cobbly loam. The Gunsight soil is on the sides and on some tops of alluvial fans. It has a profile similar to the one described as representative of the series, but the surface layer is cobbly and slopes range from 1 to 10 percent. The Pinal soil is on the tops of alluvial fans and in a few drainageways. The profile of this soil is similar to the one described as representative of the series, but slopes range from 1 to 3 percent. The Pinamt soil is on the tops and shoulders of some fans. This unit provides grazing.

- Gunsight-Rillito complex, 0 to 10 percent slopes (GYD) - This nearly level to moderately steep unit is on old alluvial fans. It is dissected by a series of stream channels at about 100- to 500-feet intervals. The stream channels range from a few feet to as much as 30 feet deep. Slopes on the tops of fans are seldom more than 1 percent, but short slopes along stream channels range to 10 percent. Areas are long and narrow and range from 50 to 1,000 acres in size.

This unit is about 40 percent Gunsight soils and 40 percent Rillito soils. The Gunsight soils have a profile similar to the one described as representative of the series, but the surface layer is gravelly loam, cobbly loam, and gravelly sandy loam and the soils are slightly saline below a depth of 30 inches. Gunsight soils are mainly on the top of fans. Rillito soils have a profile similar to the one described as representative of the series, but the surface layer is loam, gravelly loam, gravelly sandy loam, and sandy loam and in places the soils are slightly saline below a depth of 30 inches. The Rillito soils are in circular spots near drainageways and near the tops of fans. The unit is used for range.

- Laveen-Coolidge association, 0 to 3 percent slopes (CV) - This nearly level to gently sloping unit is on old alluvial fans in Rainbow Valley and in the area north of Buckeye. It is about 1/2 mile to 4 miles from granitic, granite-gneiss, and quartzsite mountains. It is dissected by stream channels at 50- to 300 foot intervals. Slopes are generally less than 1 percent, but a few short slopes are more than 2 percent. Areas range from 100 to 1,000 acres in size and are somewhat pear shaped.

  This unit is about 40 percent Coolidge sandy loam and 40 percent Laveen sandy loam. The Laveen soil has a profile similar to the one described as representative of the series, but the surface layer is sandy loam. The Coolidge soil is on the upper part of alluvial fans, and the Laveen soil is on th lower part.

  Included with this unit are small areas of Antho sandy loam, 0 to 1 percent slopes; Perryville gravelly loam, 0 to 1 percent slopes; and Rillito loam, 0 to 1 percent slopes. Included soils make up about 20 percent of the unit. This unit is grazed.

- Perryville-Rillito complex, 0 to 3 percent slopes (PRB) - This nearly level to gently sloping unit is on old alluvial fans and valley plains. It is dissected by shallow stream channels, 1 foot at 3 feet deep, at about 50 to 200-foot intervals. Slopes are generally slightly convex and less than 1 percent, but a few short side slopes are nearly 3 percent.

  Included with this unit are small areas of Antho sandy loam, 0 to 1 percent slopes; Coolidge sandy loam; Laveen sandy loam; and Gunsight gravelly loam, 0 to 1 percent slopes. Included soils make up about 15 percent of the mapping unit. This unit is used for range.

- Pinal gravelly loam (PT) - This nearly level to gently sloping soil is on old alluvial fans around the margins of low hills and mountains and on stream terraces. Some fans

extend several miles from the mountains. On the tops of fans slopes are seldom more than 1 percent, but short side slopes are as much as 3 percent. Areas are oblong and range from 100 to 500 acres in size. This Pinal soil is used for range.

- Pinamt-Tremant complex, 1 to 10 percent (PYD) - This gently sloping to steep unit is an old alluvial fans that radiate out from the Estrella and White Tank Mountains. It is dissected by shallow stream channels at about 50- to 100-foot intervals. Elevations range from 2 to 20 feet from the bottom of drainageways to the top of fans. Slopes generally are about 3 percent, but side slopes of fans range to as much as 10 percent. About 40 to 80 percent of the surface is covered with angular cobbles, gravel, and a few stones.

  About 30 to 80 percent of the surface is covered with cobbles, gravel, and a few stones. Slopes range from 2 to 10 percent. The Tremant soils are in the center of alluvial fans. They have profiles similar to the one described as representative of the series, but their surface layer ranges from gravelly sandy loam to gravelly clay loam. About 20 to 50 percent of the surface is covered with gravel and a few stones and cobbles. Slope range from 1 to 3 percent. This unit is used for range.

- Rock outcrop-Cherioni complex (RS) - This unit is on mountain sides and some low hills of the area. It occurs in several county and city parks. Slopes range from 5 to 90 percent. Areas are large and irregular in shape. This unit is mainly about 65 percent Rock outcrop and about 20 percent Cherioni soils, but in some areas is less than 50 percent Rock outcrop. The cherioni soils have profiles similar to the one described as representative of the series, but in some areas are very cobbley or stony. This unit has few uses. The lower slopes are occasionally grassed following seasonal rains.

- Torrifluvents (TB) - This unit consists of young, unconsolidated gravelly, cobbly, and stony alluvium. It is on young alluvial fans at the base of several mountain ranges where it is subject to frequent overflow. The surface is very undulating and dissected by many stream channels that have cut 3 to 25 feet below the surface. Slopes range from less than 1 percent to 5 percent. The steeper slopes are near the base of the mountains. Areas are long and narrow and about 200 acres in size.

  Torrifluvents is highly stratified and varies widely in texture. It is 35 to 80 percent gravel, cobbles, and stones. The stony soils are near the mountains, and the gravelly soils are 1/4 to 1 mile from the mountains. Included in mapping are a few areas of Antho and Ebon soils. Torrifluvents is used for range.

(Source: **Soil Survey of Maricopa County, Arizona,** United States Dept. of Agriculture Soil Conservation Service in Cooperation with U of A Agriculture Experiment Station, Sept. 1977)

6. **Noise**

The Phoenix-Goodyear Municipal Airport is a source of noise with close proximity to the park. Aircraft noise levels are one of the most noticeable environmental effects an airport will have on its surroundings. The airport consultant conducted appropriate measurements of cumulative noise exposures over a specified time period. The existing aircraft noise generated in the Phoenix-Goodyear Airport create a 65 Ldn contour encompassing approximately 365 acres.

In general, it is not until noise levels of 65 Ldn are experienced that land uses are adversely impacted. Noise levels below 65 Ldn have been found acceptable for single-family residential areas, while higher noise levels are acceptable in more intensely utilized areas. The airport's Environmental Assessment Study concludes that no significant noise impacts will result from continued or future operations and existing and future land uses in the vicinity of the Phoenix-Goodyear Airport.

The Phoenix International Raceway, located adjacent to the northeast corner of the park, is an infrequent noise generator. No specific noise study has been conducted around the site, however, neighbors' complaints have been brought to the consultant's attention.

Additional noise of much lesser magnitude is generated by traffic traveling on Estrella Parkway. Currently, traffic is very light but future traffic increases will generate much higher noise levels. Presently, the traffic is not considered a significant noise factor.

7. **Air Quality**

Air pollution in the Phoenix Metropolitan Area is generally determined by three pollutants: Carbon Monoxide, ozone and total suspended particles. Carbon monoxide is generally the major source of air pollution throughout the metropolitan area. The majority of carbon monoxide is generated from the automobiles, and although this gas quickly converts to carbon dioxide in the atmosphere, it can reach dangerous levels in areas with heavy traffic and little air movement.

Ozone is a poisonous form of oxygen that is a basic element of smog. Ozone is formed in the atmosphere through a series of photochemical reactions. The automobile is the primary source of gases which form ozone. The relative levels of ozone will increase during the daylight hours and decrease during the night.

Total suspended particulates are a measure of solid particles and liquid particles that remain suspended in the air. Particulates include dust, soot and smoke, substances which are usually non-toxic, and liquid particles that can be very toxic.

General air quality conditions in the Phoenix Metropolitan Area range from good to moderate with carbon monoxide levels usually the highest and most hazardous in November and December, and ozone levels highest during the summer months. Due to these conditions, the Maricopa Association of Governments Urban Planning Area has been classified as a non-attainment area for carbon monoxide, particulates, and ozone. The Maricopa County Health Department may require construction permits in order to control sources of such pollutants.

The most significant source of air pollution for Phoenix and the Estrella Mountain Regional Park area is from suspended particles. The large areas of land under cultivation create extremely high levels of dust and soil particles that mix with other particulates in the atmosphere. Federal Standards for total suspended particles are exceeded throughout the year in the Phoenix area.

Air quality in the Phoenix Metropolitan Area is becoming an increasing problem, and if not recognized with programs implemented to reduce pollution, the Phoenix "quality of life" will begin to erode and affect current growth trends. Air quality also impacts views from the park. During poor air quality days, Downtown Phoenix is not visible. However, during these same days, the views from the park to the southwest are virtually uninterrupted.

8. Cultural Resources

The purpose of this section is threefold: 1) to reestablish the fact that the Estrella Mountain Regional Park contains valuable historic and prehistoric cultural resources, 2) to identify these resources, and 3) to emphasize that the park's cultural resources need not limit, but instead enhance successful Master Plan development.

The cultural resource records and figures in this section are based upon BRW's field visual check and information provided by the following sources:

- State Historic Preservation Office (SHPO)
- Office of Cultural Resource Management, Arizona State University
- Arizona State Museum, University of Arizona
- Maricopa County Parks and Recreation Department
- Arizona State Parks
- Pueblo Grande Museum

Although there has never been a formal intensive, systematic archaeological reconnaissance survey performed in the Estrella Mountain Regional Park, many related publications and reports exist.

Archaeologists maintain that the alluvial floodplain of the Gila and Salt River confluence, abutting the Sierra Estrella Mountains, contains important information about land use patterns of historic and prehistoric peoples. It is well-documented that generations of native and Anglo-Americans used the riverways as major transportation/trade routes, and to irrigate domestic crops.

The interior of the Sierra Estrella mountain range was only fully surveyed in recent history, but former inhabitants were familiar with the mountains and utilized them for their wild game, natural rock outcrops for tool manufacture, caves and rock shelters for protection and possible ceremonial use, and for other indigenous resources.

Long before modern urbanization in the region of the Estrella Mountain Regional Park man interacted intensely with his environment, and one must assume that the potential for archaeological sites here is high.

Prehistoric Cultural Resources

Past research by groups or individuals of areas adjacent to the Park includes a map of prehistoric irrigation canals by O. Turney, published in 1929 in conjunction with G. Kelly, State Historian. Studies by F. Midvale, Fowler, the Gila Pueblo (a private consulting archaeological firm), the Museum of Northern Arizona, the Pueblo Grande Museum and others indicate the existence of numerous Hohokam and historic native American settlements in the vicinity (Figure 14). Significant sites such as the Cashion Site (SHPO site file NA14690, on the National Register of Historic Places as an archaeological district), the Alkalai Ruin (SHPO site file NA12542), the Villa Buena site (site file AZ T:12:3 [ASU]) and others have been identified and surveyed (Figure 14).

The most comprehensive list of sites within the Estrella Mountain Regional Park is contained in a report written in 1963 by Alfred E. Johnson under Emil Haury, Director, Arizona State Museum entitled An Appraisal of the Archaeological Resources of Five Regional Parks in Maricopa County, Arizona. This report is based on a survey made for the Maricopa County Parks and Recreation Department (Figure 15). Johnson authenticated, or verified, twelve sites within the park boundaries with the help of Jim Jenkins, former Park Ranger. A brief overview of these sites (including legal descriptions only described by the whole section for site protection) is as follows:

- AZ:T:11:3

  Patayan village site in Section 33, T.1N., R.1W. The site is located on a sand dune area at the north end of the Park (within the existing park picnic loop) on the south bank of the Gila River. Pottery recovered from the site by Johnson indicates a site date between A.D. 1700 and 1930, by the assumed ancestors of the present day Maricopa Indians. Historical research documents that the region of AZ:T:11:3, along the Gila River, was controlled by the Maricopa Indians. Recent construction of an Estrella Park playground on the site by park personnel uncovered lithic and ceramic debris. Field visits by BRW archaeologists verified the presence of an extensive village site, with numerous surface artifacts and possible historic/prehistoric canals noted, covering approximately 25 acres.

- AZ:T:11:4

  Rockshelter (1 meter x 2 meters in dimension) on the side of a wash which drains into the Gila River from the north slope of the Sierra Estrella, located in Section 32, T.1N., R.1W. Possibly a temporary campsite, yielding Hohokam pottery and dating between A.D. 1100-1450.

- AZ:T:11:5

  Quartz outcrop with pottery sherd scatter covering approximately ten acres, located in Section 28, T.1N., R.1W. Hohokam affiliation dating between AD 1000-1450.

- AZ:T:11:6

  2m x 2m rockshelter on a hillside near the north end of the Sierra Estrellas in Section 16, T.1S., R.1W. Possible temporary campsite with indication of burning on roof. Presence of pottery reported, but none recovered. Cultural affiliation and dates unknown.

- AZ:T:11:7

  Hohokam pottery sherd scatter over approximately ten acres. Located in Section 20, T.1S., R.1W. Possible temporary campsite dating between AD 500-900.

- AZ:T:11:8

  One-acre Hohokam village site, containing possible architectural rock feature, in Section 16, T.1S., R.1W. Cultural material present but disturbed, dating between AD 500-900.

- AZ:T:11:9

  Circular rock feature situated on top of a low hill, located in Section 6, T.1S., R.1W. Hohokam pottery present, dating site between 900-1100. Field investigation by BRW indicated presence of rock outcrop and lithic shatter, and pottery on the surface.

- AZ:T:11:10

  Hohokam sherd scatter over approximately one acre, located between two washes which drain into the Gila River in Section 8, T.1S., R.1W. Site date is between AD 900-1450.

- AZ:T:11:11

  Hohokam site marked by a sherd scatter, rock outcrop, and bedrock mortars covering approximately one acre and located in Section 32 T.1N., R.1W. Site date unknown.