

- AZ:T:11:13

Petroglyph site on a steep, rocky hillside in the northwest corner of the Park, Section 32, T.1N., R.1W. About a dozen geometric and anthropomorphic figures have been pecked into the boulders on the hillside. Hohokam pottery, dating between AD 700-1450, was originally noted. Field investigations by BRW verified site location and additionally noted presence of metate and mano (in situ) among petroglyphs.

- AZ:T:11:14

Pottery sherd scatter (possibly from one vessel) covering approximately one-half acre in a canyon near the head of Corgett Wash, Section 34, T.1S., R.1W. Patayan cultural affiliation; site date unknown.

- AZ:T:11:15

Temporary campsite as indicated by Hohokam pottery sherd scatter along Corgett Wash in Section 29, T.1S., R.1W. Possible site date AD 900-1100.

An additional site, AZ:T:11:29, was located within the park by the Arizona State Museum, and was described as being a sherd and lithic scatter with Hohokam affiliation.

In addition to the list of recorded sites, field visits by BRW archaeologists and accounts by park personnel indicate the existence of Sites not previously recorded. Through personal communication, it is known that two nearly-complete Patayan pottery vessels were discovered by the Girl Scouts in the late 1970s or early 1980s, in a rockshelter on a remote hillside within the park. The vessels were acquired by the Pueblo Grande Museum, whose staff performed further site investigations. The site was found to be extensively disturbed, and has not been recorded.

Other rockshelters with potential for containing significant archaeological data, rock outcrops which have been prehistorically exploited, petroglyphs whose locations have not been verified, and multiple sherd and lithic scatters are reported to exist but remain unrecorded.

### Historic Cultural Resources

No sites within the Estrella Mountain Regional Park have been listed by the State Historic Preservation Office on the National Register of Historic Places. However, one trail, described as being used by pioneers travelling from Phoenix to Little Rainbow Valley, is recognized by the Arizona State Parks Board as being a historic trail. Pack Saddle Trail (state Historic Preservation Office (SHPO) site file number 1197) bisects the park from northeast to southwest and is currently used by horseback riders and hikers.

Other trails of historical significance, used by early explorers, fur trappers, surveyors, military units and pioneers bypass the park and follow the Gila River to the north or skirt the Sierra Estrellas to the south. Although no permanent historic encampments or stations are currently recorded within Park boundaries, these major transportation/trade routes played an important part in regional development.

Homesteaders and ranchers began staking claim to property within the Estrella Mountain Regional Park boundaries as early as 1889. The official G.L.O. plats of 1914 and 1917, surveyed by Sidney E. Blout, show a frame house located in the southwest one-fourth, Section 33, T.1N., R.1W., and property owned by James H. Kennedy in Section 3 or 4, T.1S., R.1W. Traces of any structures in these areas have since been destroyed.

Between 1900 and 1930, only one homestead entry and six land lease claims appear in the files of the Bureau of Land Management (BLM), and the Arizona State Land Department (ASLD). Water claims were filed as early as the 1870s. Documents describe various proposals by individuals and companies to channel water from the Gila River to provide for stock and for irrigation; however, the Coolidge Dam on the Gila River, completed in 1929, stopped most of the river flow and put an end to any additional diversion.

Evidence of historic mining activity is visible in the park, although the Sierra Estrellas are generally considered void of valuable minerals and gemstones. One mine, the Buckeye Placer, was patented within the Park in Section 33, T.1N., R.1W., in 1915.

During the 1920s, 14 homestead claims and six land lease claims were filed in the Park but all were eventually canceled or transferred after tenants failed to make necessary improvements. After 1940, all homestead claims, land leases and mining claims were eventually transferred to or bought by Maricopa County for incorporation into the Estrella Mountain Regional Park. One of the last private landowners was Hassayampa Clyde Pedersen, whose father, Hans Pedersen, homesteaded and improved 160 acres in the southwestern corner of the park. The property was sold to the County in the mid 1970s. Remnants of the Pedersen residence, outbuildings, and mining activity are still visible on the site.

At least one previously-listed archaeological site, AZ:T:11:3, is a village site possibly occupied in historic times by ancestors of the present day Maricopa Indians. As early as 1700, Spanish and Anglo-American travellers could have come in contact with the site's inhabitants and been trading for food and supplies. The Maricopas were, simultaneously, in contact with other historic Indian tribes such as the Yumas, Pimas, and Apaches. For these reasons, site AZ:T:11:3 should be regarded as an important site with the potential for yielding significant historical archaeological data.

### Summary

Although a systematic Phase 1 reconnaissance archaeological investigation has never been performed in Estrella Mountain Regional Park, 14

potentially significant historic and prehistoric archaeological sites have been recorded. Twelve sites were identified and verified by Alfred E. Johnson of the Arizona State Museum (ASM) for the Maricopa County Parks and Recreation Department with the help of Park Ranger Jim Jenkins in 1963. Another site, AZ:T:11:29, was also recorded by the Arizona State Museum. One historic trail, the Pack Saddle Historic Trail, has been dedicated by Arizona State Parks.

Because of its strategic location at the convergence of two major drainageways, the diversity of natural resources in the area, and the identification of cultural material by BRW and park personnel beyond what has been recorded, it is suspected that numerous cultural resources have yet to be located and identified. The archaeological record to date reflects a small percentage of the suspected cultural resources existing in Estrella Mountain Regional Park. This fact was confirmed by park personnel, local informal interviews, and BRW's field visits to the park.

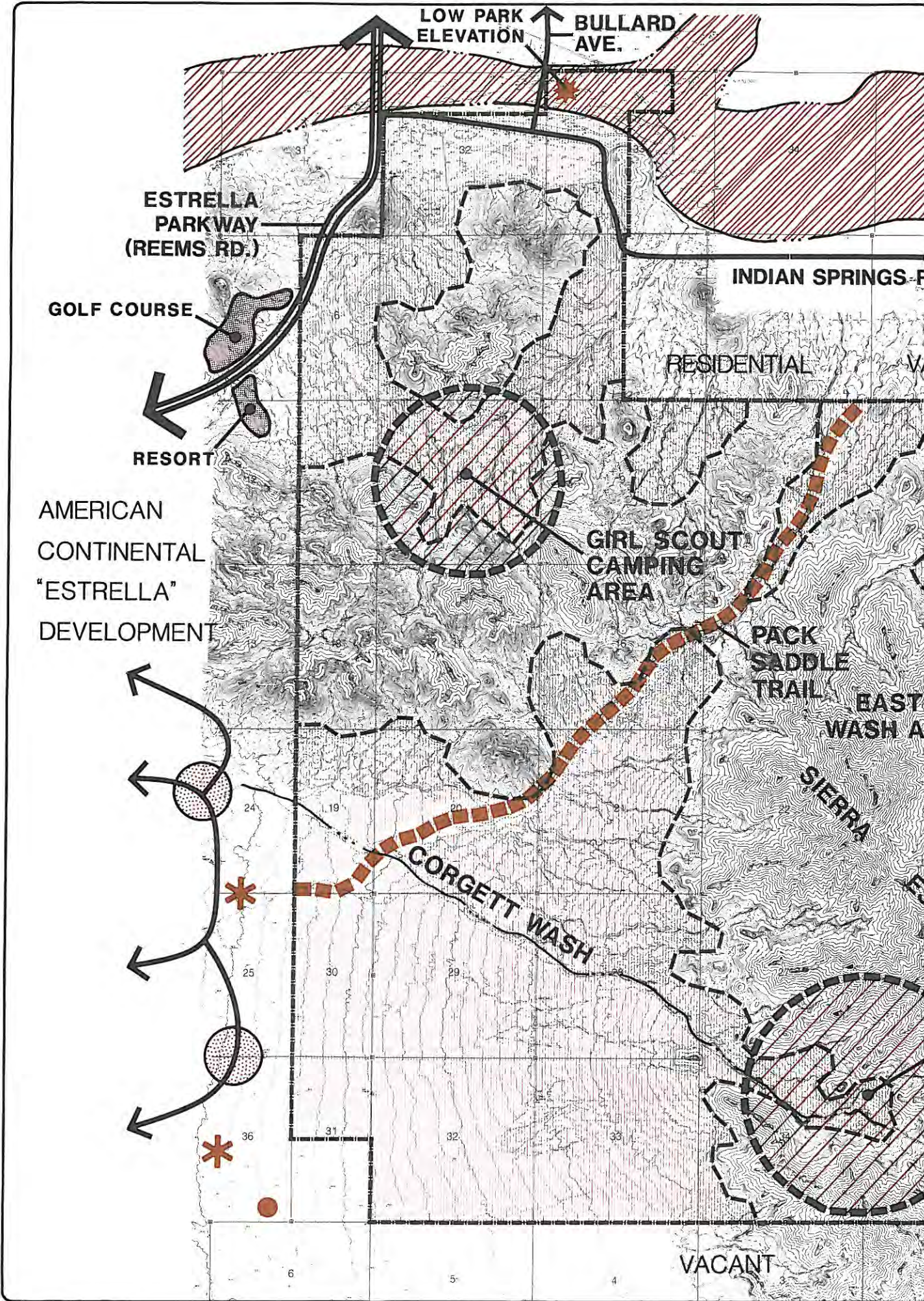
#### Recommendations and Conclusions With Respect to Future Park Planning and Development

Estrella Mountain Regional Park contains numerous recorded and unrecorded historic and prehistoric cultural resources. Since these resources are of a non-renewable nature, a high degree of importance, over other renewable or replaceable park resources, should be assigned to them in future park planning. The management of these cultural resources provide for many opportunities for scientific research, preservations of Arizona's non-renewable cultural resources and future interpretation of these resources with a planned park framework.

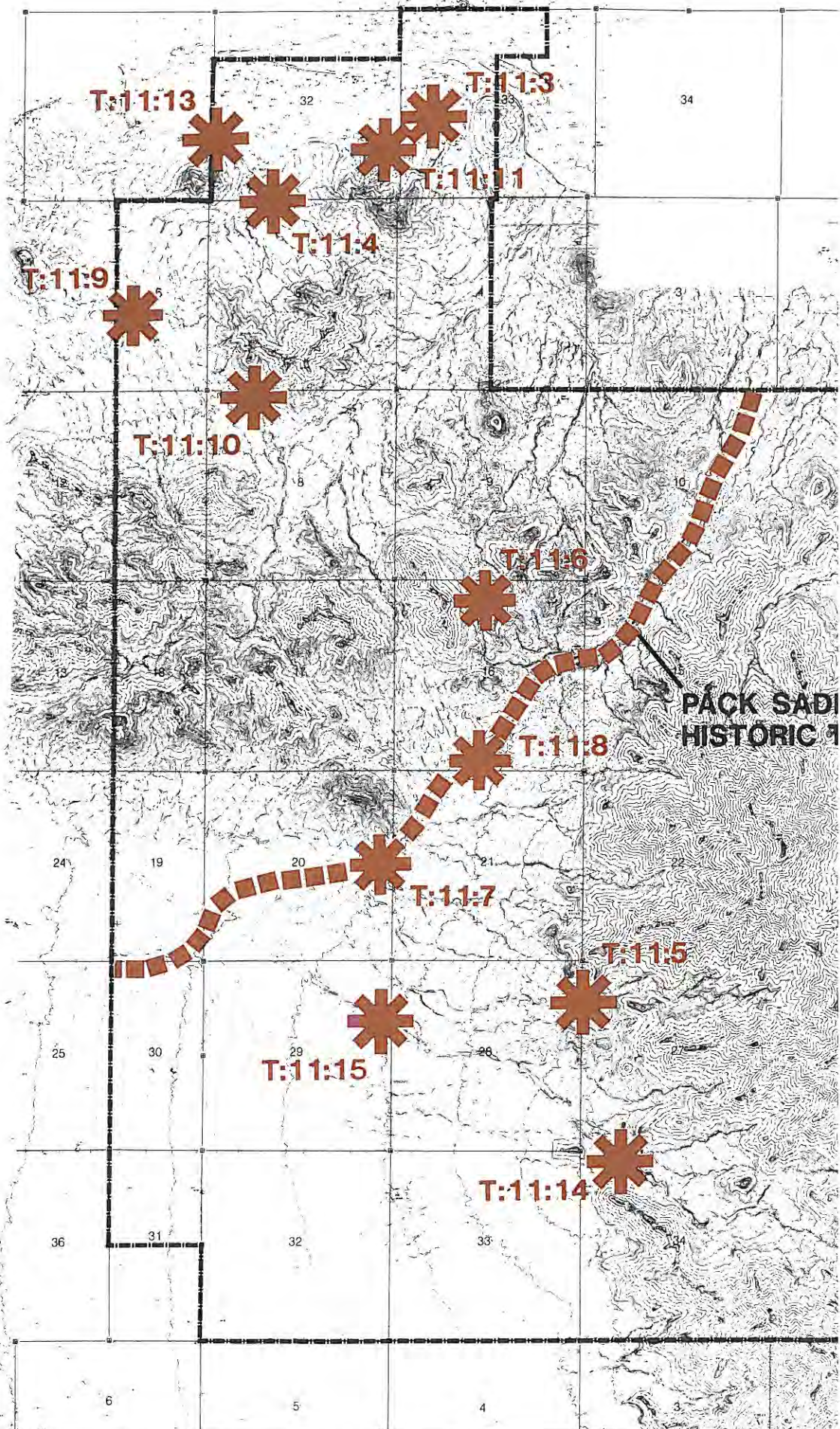
The purpose or goal of this section is to assess the potential of the park's cultural resources and to suggest steps or phases for this cultural resource management (CRM). The following statements and/or facts provide a synopsis of the finding of this review:

- Numerous significant recorded but yet un-investigated cultural resources exist within the current park boundaries.
- No complete cultural resource reconnaissance survey has been conducted across the park, and future planned development plans may affect cultural resources.
- Arizona State Law (Authority: A.R.S. §§15-1631 and 41-841, et.seq.) requires coordination with the Director of the Arizona State Museum (ASM) and the State Historic Preservation Office (SHPO) for development on "Lands Owned or Controlled by the State", or political subdivision of the State of Arizona, including any county or municipal corporation.
- Coordinated with park development, phased cultural resource reconnaissance surveys should be conducted to identify significant cultural resources and previously unrecorded resources. Future park plans should provide a means to incorporate park development, and the interpretation of the park's non-renewable cultural resources. Coordination with the

SHPO and Director of the ASM should establish an acceptable phased development approach providing cost efficiency and protection for these park resources for future Arizona generations to enjoy.

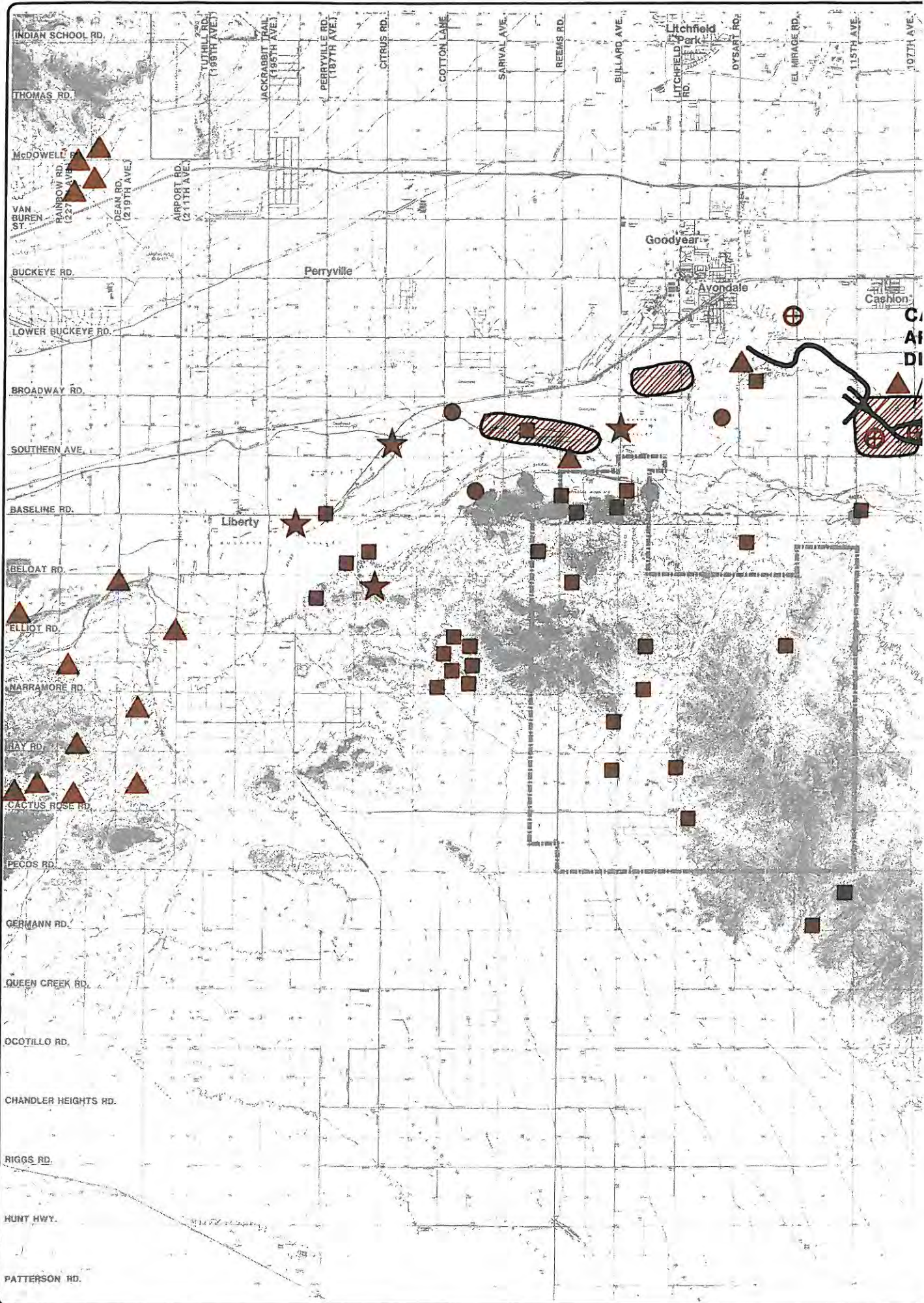












INDIAN SCHOOL RD.

THOMAS RD.

McDOWELL RD.

VAN BUREN ST.

BUCKEYE RD.

LOWER BUCKEYE RD.

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.

LUTHER RD.  
(186TH AVE.)

JACKRABBIT TRL.  
(195TH AVE.)

PERRYVILLE RD.  
(187TH AVE.)

CITRUS RD.

COTTON LAKE

SARVAL AVE.

BEEMAS RD.

BULLARD AVE.

LITCHFIELD RD.

DYSART RD.

EL MIRAGE RD.

115TH AVE.

197TH AVE.

Perryville

Liberty

Goodyear

Avondale

Cashon

CASHON



## C. SITE SUITABILITY ANALYSIS

Because of the size and rugged character of the park, state of the art computer technology was utilized to help accomplish the site suitability study. This technology provides an interactive system that would be available for updating and expanding the data base in the future. Additional or more indepth analysis could be done on this system as the park conditions continue to change.

The Idaeim image analysis system was used in the Estrella Mountain Regional Park Masterplan project to provide site suitability maps for a range of potential uses. This system was also used to generate a computer data base of maps of the project area including all relevant data collected by project consultants. The spatial analysis methods used on this project included data processing analysis to enhance and expand the data base, and planning analysis using the composite suitability method for evaluating the weighted combination of spatially distributed data within the project area. A set of composite maps were produced by Idaeim which reflect the relative suitability of the park area for selected planned uses. These maps represent the opportunities and constraints offered by the existing natural landscape and park features. They were used in the conceptual design phase of the master plan to generate alternative plans.

### 1. Idaeim Image Analysis System

Idaeim, a Tucson-based computer imaging firm, has developed an image analysis system with specific applications for land use planning. The Idaeim system combines well-established methods of planning analysis, such as the composite suitability method of analyzing mapped factors, with interactive computer imaging technology. The Idaeim system utilizes advanced image processing hardware to achieve real-time image analysis capabilities. Modular software components are used for fully interactive entry and analysis of data in a graphic format.

#### The Data Base

The Idaeim system provides the means for creating and managing large and detailed map data bases. Choropleth map information (that is, classes of data represented by areas on a map) is literally drawn into the imaging system from an electronic digitizing tablet. The digitized image is represented on the display monitor by over a quarter million pixels (picture elements) organized as a 512 x 512 array of data values. As each area is drawn, the pixels within it are assigned an image value (from 0 to 255) which corresponds to a specific type of data, for example, an elevation contour interval or soil type. These values are used to distinguish the data types in subsequent analyses.

In this way, a series of data, or factor, maps for the same geographic area are entered into the data base. The imaging system automatically

adjusts each factor map to a consistent scale regardless of the size of the original map, so that all maps for the same area are registered precisely with one another. Because the system is not dependent on data being at any specific scale, the resolution at which data are to be represented is selected to suit the needs of the project.

Once in the computer system, raw data is processed in several ways to enhance the information in the map and produce new data factors. For example, elevation contour line data is interpolated to produce a smooth surface map which is then used to calculate a slope and aspect value from every point, and, thus producing new factor maps. Proximity analysis characterizes each point in an image in terms of its proximity to selected map features such as washes or trails. Descriptive statistics are provided for each factor map detailing, among other things, the amount of surface coverage for each type of data.

### Composite Suitability Analysis

For the purposes of site master planning analysis, the focus is on the composite suitability analysis method of land use planning. This method is a common sense approach to understanding the complex characteristics of a region or site. The process rests on three primary concepts: issues, data, and values.

Issues - At the beginning of the compositing process it is necessary to define the issues, or questions, which will direct the analysis. These may be general assessments of the suitability of a region for a given use, or they may relate to specific patterns of activity, or both depending on the objectives of the project.

Data - Clearly, data - including descriptive information of both conditions and processes - are key components of any analysis. For composite analysis, factors having influence on decisions regarding the issues to be considered are identified. Appropriate data that characterize the project area and reflect the underlying processes active at the site are assembled into an integrated map database.

Values - The key to the composite suitability method is the evaluation of the data in an explicit and systematic way. Each data factor map, and each category of data within each factor map, is considered in turn and given a weighting value reflecting its significance for contributing to, or impacting on, the issue being considered. For example, slope as a factor may be considered of critical importance when evaluating the issue of vehicle access to the park, and the distribution of specific slope categories will differentially influence the siting of access routes. These evaluations are reflected in the weighting scheme applied to the slope data factor map. All available relevant data factors are evaluated for the same issue context and given appropriate weights. These weightings together constitute evaluation matrices, or tables, one for each "view" of an issue, which are used in the composite analysis.

This evaluation process explicitly distinguishes the planning issues, the data used to clarify them, and the contextual values or judgments that are the basis of the analysis. The method formalizes the common sense processes of making land use decisions by utilizing scientific techniques in the form of computer-based tools under direct human control. The evaluation matrices provide an objective means of assessing the criteria and assumptions used in the analysis. Composite images are produced by combining the weighted data maps and reveal the intrinsic suitabilities (positive, negative, or neutral) of the project area for the given land use. The subjectivity of human values and the controversies that are typically associated with land use issues call for the evaluation of the objective data factors in the context of different scenarios or views. This is accomplished in composite suitability analysis by changing the pattern of weights used in the evaluation.

The Idaeim image analysis system has incorporated the composite suitability process into a software module which enables the interactive assignment of weighting values to data factors. The results of altering weights are immediately visible in the composite map image displayed on the monitor, providing continuous feedback to the analysis. Composite maps are created by the normalized summation of weighted data maps. The numerical nature of the data and the corresponding arithmetic procedures combining layers of weighted factor maps and generating a normalized suitability composite provide parity among the factors and accuracy of results regardless of the number of layers used in the compositing or the weights assigned to the data.

Weights and resultant composite suitability levels are always in the numerical range of -100 to +100 for consistency and ease of understanding: -100 implies 100 percent unimportant or unsuitable; 0 implies no effect, or neutral; and +100 implies 100 percent important or suitable. Weighting levels reflect the value system applied by the analyst and produce suitability composites which, because they are numerically derived, can be meaningfully compared with suitability composites derived from different weighting schemes.

## **2. Estrella Mountain Regional Park Data Base**

Estrella Mountain Regional Park encompasses approximately 19,200 acres of a diverse landscape which ranges from the floodplain of the Gila River to the extremely rugged heights of the Estrella Mountains. The entire park was digitized as a single image yielding a spatial resolution of approximately 84 feet/pixel. Eight data factor maps were used in the composite analysis for the project area. The data were provided to Idaeim by project consultants. The following list briefly describes each data map.

- Elevation - Idaeim received digital elevation contour lines on magnetic tape for the project area from Kenney Aerial. The elevation contours were interpolated to produce a surface elevation map.
- Slope - The surface elevation information was converted to slope values (in percent) using Idaeim software.

- Aspect - The orientation of the ground surface within the project area was also calculated from the surface elevation.
- Vegetation - Community-level plant associations were mapped for the project area, generating nine distinct vegetation types.
- Soils - Soil associations based on Soil Conservation Service studies were mapped. Six soil types are represented within the park.
- Drainage Patterns - Major drainages within the project area were ranked by Idaeim in terms of the number of tributaries (ranging from 1 to 40) feeding them. A proximity map was generated, delineating areas within approximately 400 feet of a wash.
- Watersheds - A simple watershed map was produced dividing the park into three areas.
- Trails - Existing trails were mapped, including jeep trails and hiking trails. Some of the trails within the park have historical significance. A proximity map was generated showing the distance of each point within the project area from an existing trail.

### 3. Interactive Composite Analysis

After reviewing with project consultants the issues and values which were emerging for the park area based on the site inventory and public participation elements of the project, Idaeim staff incorporated these perspectives into evaluation contexts and weighting values which were used to produce composite suitability maps.

The following sections describe each of the composite maps produced, including the general rationale for data factor weightings and a summary of the patterning and relationships evident in the map.

Results are divided into two levels of analysis: first order composites and metacomposites. First order composites are produced directly from the raw data in the data base, and tend to reflect a single conceptual issue or use context. Metacomposites are composites of composites which combine issues to reveal the patterns of compatibility between primary uses.

Interpreting the composite maps involves viewing the distribution of suitability values over the surface of the project area and looking for patterns. The suitability values are displayed in shades of gray as shown on the legend of each map. Areas of positive suitability range from white at +100 to neutral gray around 0. Areas of negative suitability shade to solid black at -100.

## First Order Composites

- Recreational Development

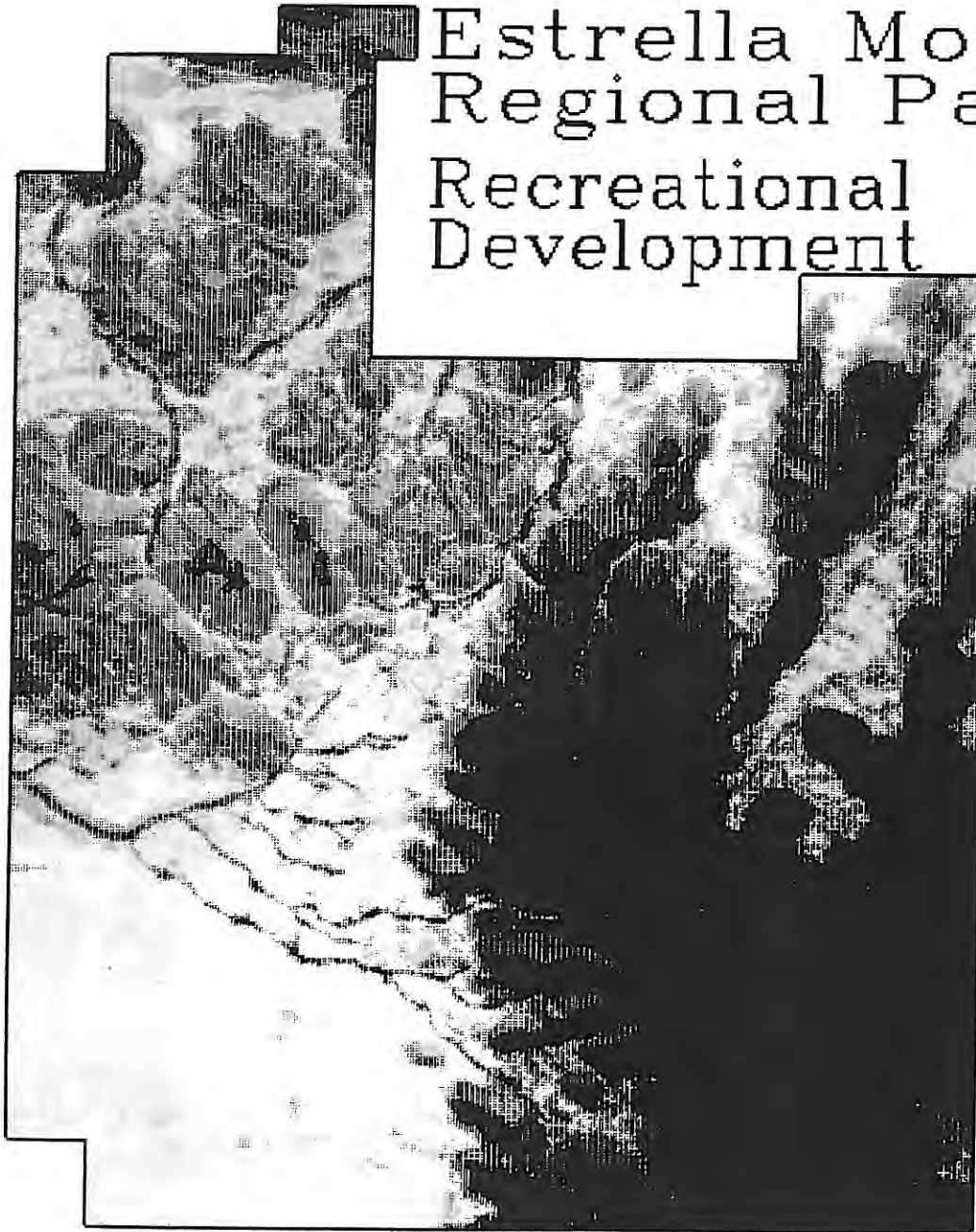
Eight data maps were combined to produce a composite map showing the suitability of the park area for active recreational development. Slope, Proximity to Drainages, and Proximity to Trails (all weighted at +100) were considered the most important contributing factors. Slope is an indication of the amount of mitigation required for recreational development through appropriate design and landscape modification. Slopes to 5% were weighted 100 percent suitable, diminishing linearly to 0 at 15% slope. Increasingly (linear) negative suitabilities were assigned to slopes between 15% and 40%, with all slopes greater than 40% weighted at -100. Proximity to Drainages reflects both the structural and aesthetic importance of drainages and drainage margins. In both these contexts wash channels and a 400 foot wide swath on either side of the channel were considered negatively suitable for recreational development. A linear distribution of weights from 0 to -100 characterized the wash rankings from 1 to 40 tributaries. Proximity to Trails indicates proximity to existing access routes within the park. Because these trails have evolved over the period of use of the park, they tend to follow natural corridors of least topographic resistance. Areas within 0.8 miles of a trail were considered positive for recreational development, increasing logarithmically from 0 to +100 at the trail itself. Areas beyond 0.8 miles were considered to be decreasingly likely candidates for active recreational development, ranging from 0 to -20 at a maximum distance of 2.2 miles.


Vegetation was another important factor in this context (weighted +90). River bottom and riparian washes (-100), high desert (-75), and vegetation on slopes (-50) were weighted negatively for recreational development because of their sensitivity to disturbance. The low (+50) and lush (+100) desert plant communities and desert foothills (+100) were considered positive for their aesthetic appeal. Areas of turf and trees were weighted at +80.

The other factors in descending order of importance were: Aspect (+75), weighting north and east slopes linearly positive and south and west slopes linearly negative; Soils (+60), weighting floodplain and rock outcrops negatively and deeper, better drained soils positively; Elevation (+50), weighting low to high elevation linearly positive from 0 to +100 as an indicator of better views; and Watersheds (+50), weighting the north and west regions positively and the east region negatively primarily on the basis of accessibility.

The composite map produced from this weighting scheme shows distinct areas of recreational development suitability in the southwest corner of the park and within the open valleys which extend between high ridges into the mountains in the northeast area. There are also opportunities for development in the northwest extension of the park in a circular pattern surrounding an isolated foothill. Areas of high suitability are broken up by areas of low suitability by the distinctive drainage pattern in the west central portion of the park. In this area the scale of proposed development should be carefully considered.

# Estrella Mountain Regional Park Recreational Development



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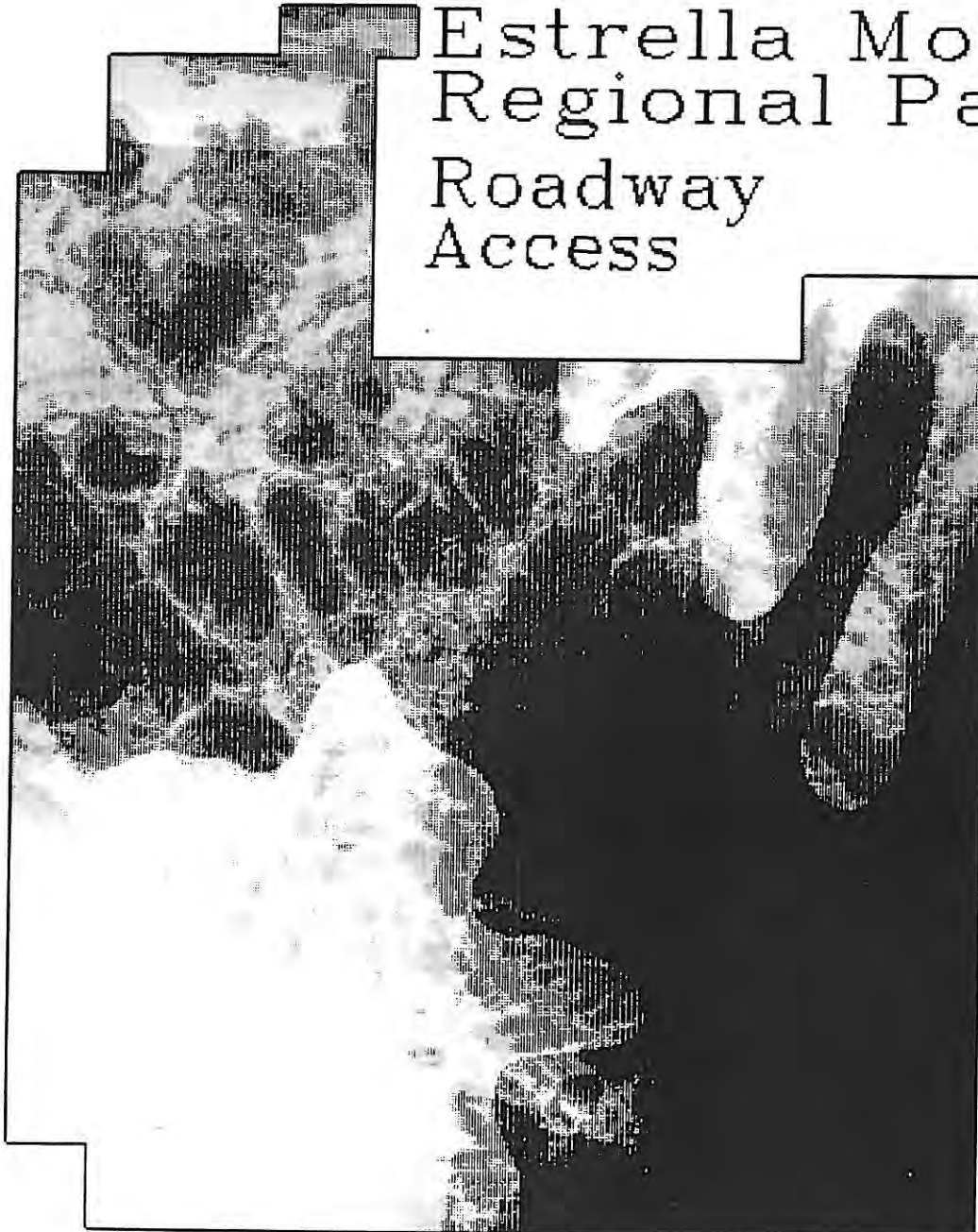
- Roadway Access

This composite map is focused on the issue of vehicle access within the park. The eight data maps were reweighted with this context in mind. The most important factors for road access were Slope, Soils, and Proximity to Trails (all +100), primarily because of engineering considerations. The positive suitability range for slope was weighted as for recreational development; the negative weights decreased logarithmically above 40 percent slope. Only the Cherioni-Rock soil association was considered negative (-50) for this composite; floodplain soils were weighted at +50 with all others above +75 percent suitable. A positive linear function was applied to the area within .35 miles of an existing trail, ranging from +100 on the trail itself to 0. An increasingly negative logarithmic function was applied beyond .35 miles.

Proximity to Drainage was next in importance for this composite (+75). Weighting values decreased linearly from -20 to -100 for washes having from 1 to 40 tributaries. Vegetation was ranked at +50 using the rationale that linear features such as roads have less impact on vegetation communities than other types of development. The only positively weighted vegetation types were the low desert (+100) and the two categories of turf (+80 with native trees; +100 with domestic trees). Other vegetation classes ranged from neutral (slopes and high desert) to -75 (riparian washes). Both Elevation and Aspect were weighted at +25 percent important. A linear function was applied to the elevation data from +100 at the lowest point to -100 at the highest point with the crossover, or neutral, point at approximately 2270 feet. All aspect values were neutral in this context except for the range from southeast to southwest. A triangular function of negative suitability, ranging from 0 to -100, was centered on south facing surfaces. The Watersheds map was considered to have no bearing on this particular issue.

The Roadway Access composite again emphasizes the southwest corner and northeast valleys of the park as well as the upper portion of the northwest extension. It also shows potential connections between these areas primarily along existing trail corridors.

# Estrella Mountain Regional Park Roadway Access



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- Natural Preservation

The Natural Preservation composite emphasizes the natural resources and special environmental contexts within the park. The most important factors were Vegetation and Proximity to Drainages (both +100). Only river bottom and turf with domestic trees were weighted negatively (-25 and -75, respectively). Turf and native trees was considered neutral; low desert was given an intermediate positive weight (+40); all others were greater than +75 percent significant with special consideration given to riparian washes, lush desert, and high desert (all +100). Proximity to Drainages was strongly emphasized with linear positive weightings increasing from +25 to +100 with the size of the drainages.

Proximity to Trails was weighted at +90 percent important. Areas beyond 0.5 miles of a trail were given increasingly positive weights on a logarithmic scale from 0 to +100. Within 0.5 miles of a trail suitability decreased linearly from 0 to -25. Topographic factors were next in importance, Slope (+80), Elevation (+75), and Aspect (+50). Low slope values were weighted negatively in this context, increasing linearly from -50 to 0 for slopes 0 to 5%. Weighting values increase logarithmically from 0 to +100 for slopes 5 to 25%, and remain at +100 for slopes above 25%. Elevation was interpreted as a component of view potential and preservation. Lower elevation levels between 890 and 1200 feet from 0 to +100 at the highest point. The Aspect factor emphasized the less exposed ground surfaces. A linear function was applied to the aspect data ranging from +100 at north to 0 at southeast to -100 at southwest to 0 at west northwest and back to +100 at north.

Both Soils and Watersheds were weighted at +25 percent. Only the floodplain soils (-75) were considered negative in this context, being subject to flooding and other disturbances. All watersheds were given positive weights with the Corgett Wash region being most positive (+100) and the North Slope Gila River region the least (+50), due to existing park development.


Very little area in the Natural Preservation composite is in the negative range of suitability. The park offers significant opportunities for the preservation of the natural desert environment, particularly in the upper bajada, foothill and mountainous zones.

- Small Group Camping and Hiking

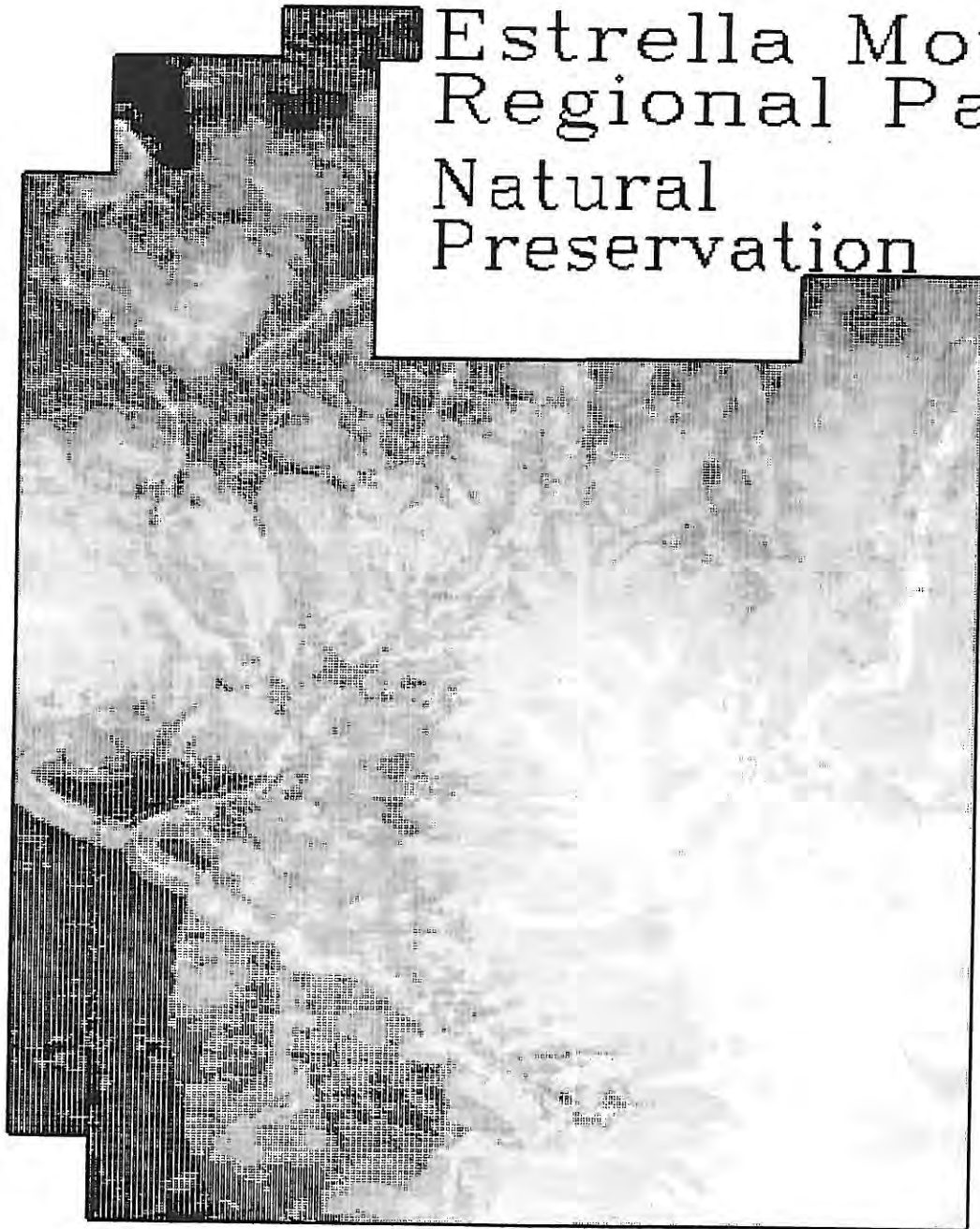
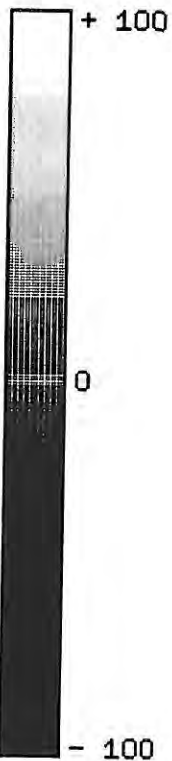
This composite reflects hiking and camping opportunities for small groups and individuals within the park. The context encompasses developed campsites, trails and remote, back country uses. The key factors in this composite are Slope and Vegetation (both +100). Weights assigned to slope values increase gradually from +50 to +100 percent for slopes from 0 to 40% and then drop off sharply to -100. In addition to the low slope areas in the basins, this pattern delineates relatively low slope areas within the mountainous portions of the park such as ridge lines. The disturbed and introduced vegetation of the floodplain and currently developed area were given negative weights in this context. All other vegetation types were weighted equally at +100.

# Estrella Mountain Regional Park Natural Preservation



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Degree of Suitability

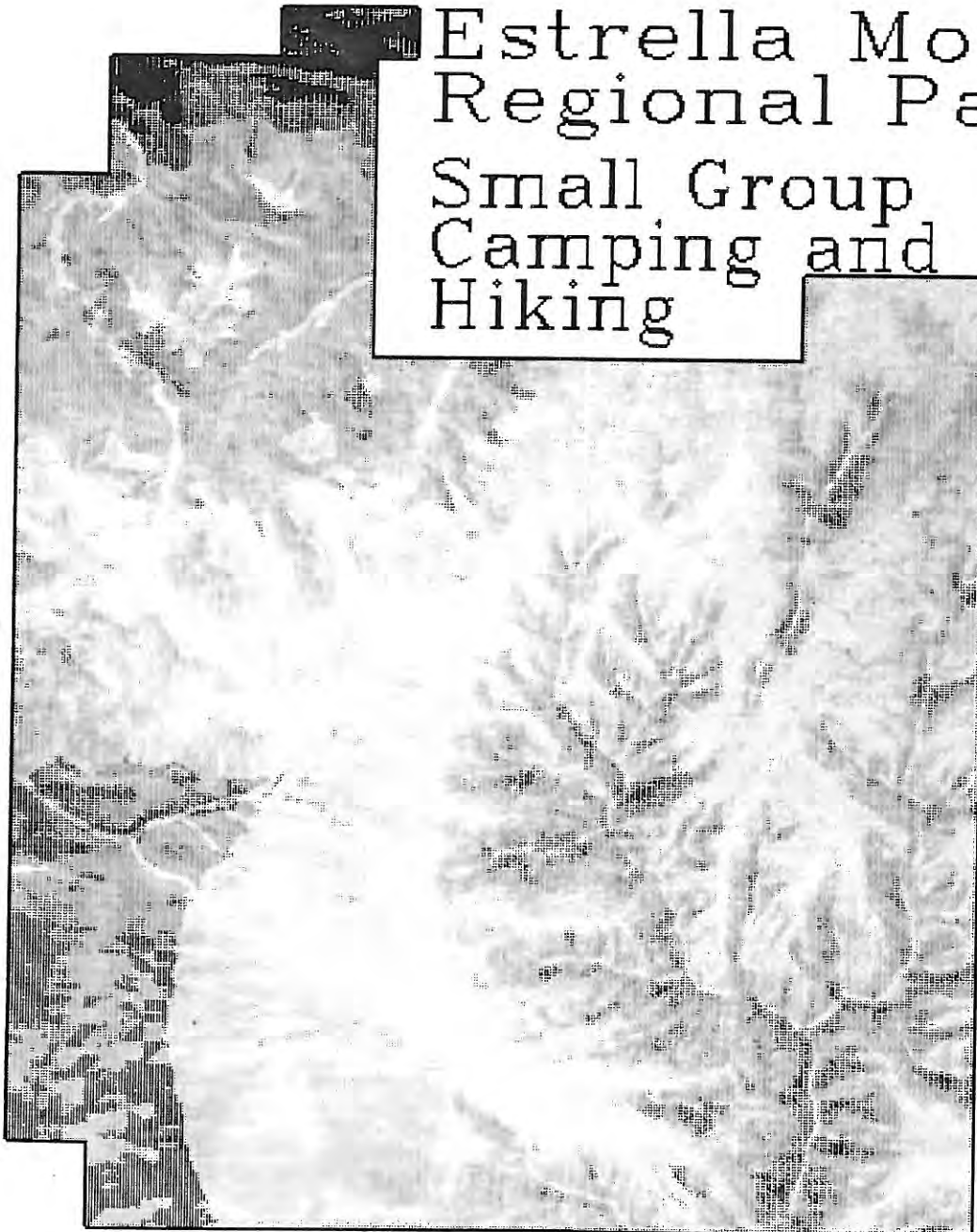


  
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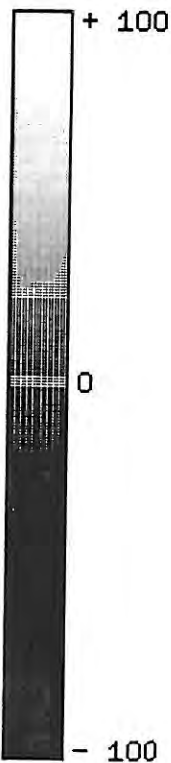
# Estrella Mountain Regional Park

## Small Group Camping and Hiking



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Proximity to Trails was weighted at +90 percent important because of its representation of existing access routes within the park. The area beyond 0.5 miles from an existing trail was given a neutral weight. Within 0.5 miles of a trail the weights increased linearly from 0 to +100 on the trail itself. Proximity to Drainages is also indicative of movement corridors (hiking and equestrian) within the park. This factor was given an overall weight of +75 and internal weights which emphasize smaller channels on the upper reaches of the drainage system over larger washes downstream. The weights turn negative for drainages with greater than 19 tributaries. The Gila River has a weight of -100.

The topographic factors of Elevation and Aspect also have weights of +75 percent. These factors reflect a preference for higher elevations and certain directional views and exposures. They use the same pattern of weightings as for the Natural Preservation composite.

Neither Watersheds nor Soils were considered relevant to this composite context.

The Small Group Camping and Hiking composite shows distinctive patterns of suitability which suggest a network of hiking trails following washes and ridges with camping sites or "staging areas" in the upper bajada areas ringing the mountains and in the mountain canyons.

#### Metacomposites

- Development Opportunities and Access

This metacomposite combines the Recreational Development, Natural Preservation, and Roadway Access composites to produce a map of enhanced development potential. The default weighting scheme was used for each of these composite, that is, positive suitabilities were given corresponding positive weighting values and negative suitabilities were given corresponding negative weighting values. The factors were manipulated by changing their overall weights. The Recreational Development and Roadway Access layers were given a weight of +100. This reinforced the areas where they were both positive: where highly suitable development areas also had good accessibility. The Natural Preservation composite was given a weight of -100. This meant that the areas of positive suitability for preservation were subtracted out of the metacomposite map, and conversely, the areas of negative preservation suitability were added into the map, further reinforcing areas of high development suitability.

The resulting metacomposite refines the issues of park development by balancing development/preservation conflicts. This results in the more specific delineation of areas suitable for development. Patterns of suitability suggest three distinct areas for recreational development: 1) the southwest corner with its relatively easy access to the upper bajada zone and the restricted canyons of the mountains' west slopes; 2) the northwest extension with its existing (and enhanced) park development, i.e. golf course, amphitheater, picnicking areas, etc.; and 3) the valleys at the north end of the mountains which potentially offer a context for interpretive/educational uses and a staging area for back country hiking and backpacking.

# Estrella Mountain Regional Park

## Development Opportunities & Access



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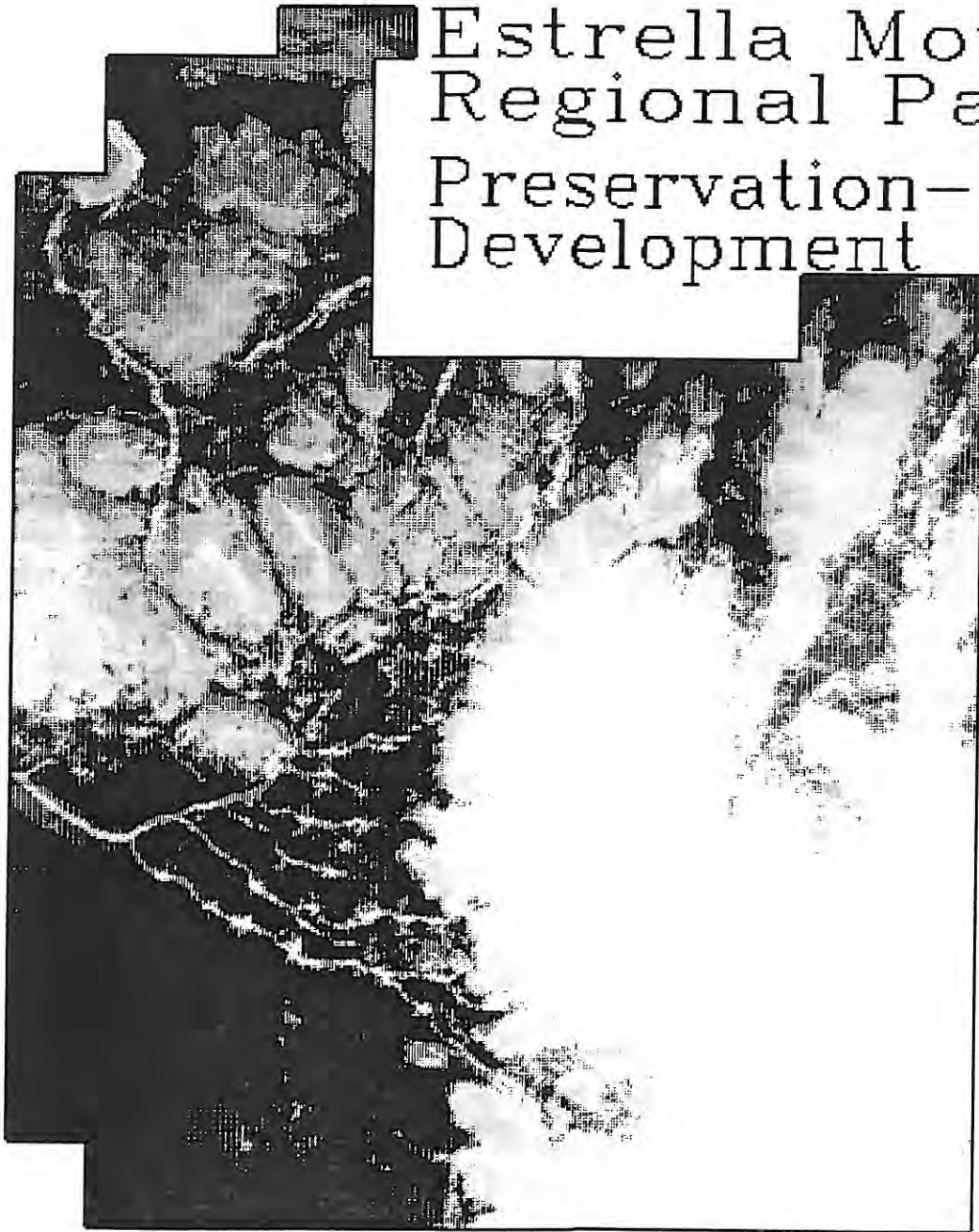
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- Preservation Development Compatibility

This metacomposite gives an overview of the compatibility between Natural Preservation and Recreational Development issues at Estrella Mountain Regional Park. At a glance it can be seen where preservation considerations outweigh development (light shades), where the reverse is true (dark shades) and where they are in potential conflict (neutral gray shades), or where recreational development activity should be designed to be especially sensitive to the environmental preservation.

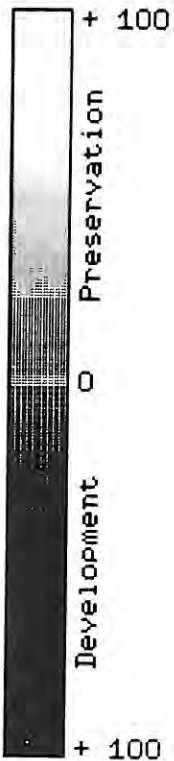


# Estrella Mountain Regional Park Preservation- Development



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Degree of Suitability



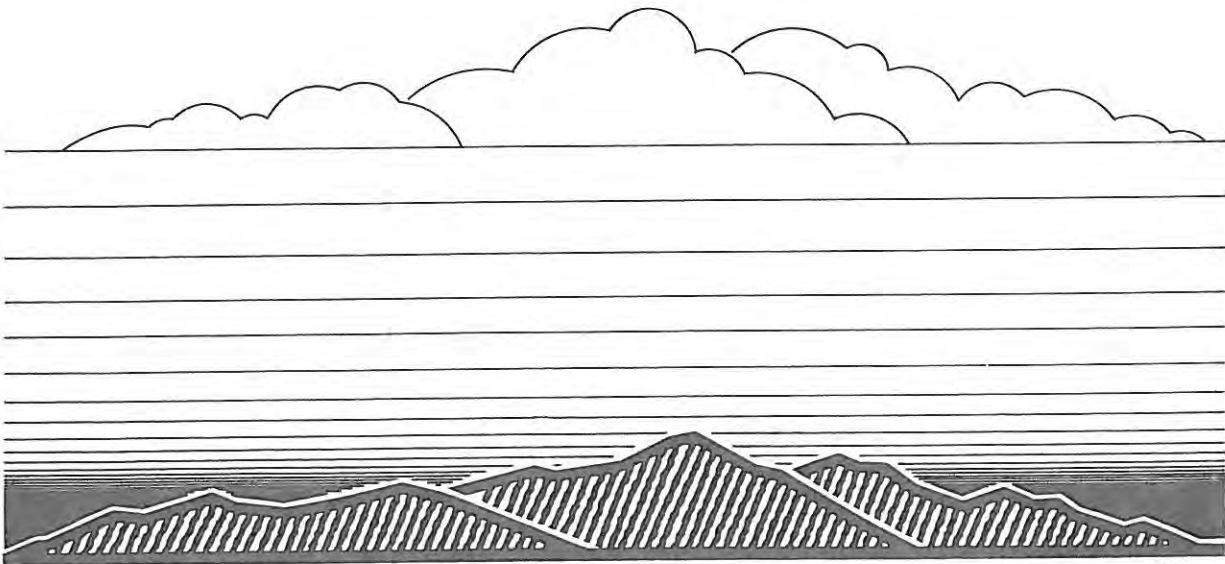
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# III

## *Public Involvement*



*Estrella Mountain Regional Park  
Long-Range Master Plan*



## A. PUBLIC AGENCY INVOLVEMENT

To gain input from the various agencies and the general public, an extensive public involvement program was utilized throughout the planning process. Public agencies were contacted at various times through the entire planning process for base information, policy direction, and for their input and guidance. Secondly, public workshops were held to explain the Master Plan process, explain work done to that point and to receive public comments, suggestions and direction. Thirdly, some individuals and representatives of special interest groups were contacted, or contacted the consultant team directly, to share their concerns or discuss development and constraints.

The County Parks and Recreation Department staff were heavily involved throughout the process. Staff and the consultant team held regular meetings one to two times per month depending on the issues at hand. The staff was continuously updated in this manner and was able to provide much input and direction in each phase of the Master Plan process. The County Parks and Recreation Commission was updated on the status of the consultant's progress several times during the planning process. Commission members were present at four of the five public meetings and actively participated in the discussions as well as answering questions from the public.

The County Flood Control District was contacted to obtain information concerning their future plans and current programs along the Gila River. These plans were then compared to the possible park development that may occur along the Gila River as a result of the Master Plan recommendations. The County Sheriffs Department met with the consultant team and staff on several occasions to discuss possibilities of a shooting range being located in the park. Their needs and general requirements were provided to the consultant team for consideration along with the possibility of a public range also being included, given an appropriate site. The County Planning Department was also kept informed of the progress of the Estrella Park planning process by newsletters. County land use plans were consulted for the areas around Laveen and Little Rainbow Valley.

City agencies were contacted early in the process to compile base information and future plans for the area around the park. This included obtaining information and land use plans for the cities of Buckeye, Goodyear, Avondale, Tolleson and Phoenix. The Gila River Indian Community was contacted to establish what future development the Reservation community might be planning. The Towns of Avondale and Goodyear were more heavily involved throughout the planning process because of their proximity to the park and because of the Goodyear's recent annexation of a portion of the park.

The Arizona State Game and Fish Department and the Arizona State Land Department were both contacted concerning a number of issues. The

Arizona Game and Fish Department provided the most current information possible on rare or endangered species of animals and plants likely to occur within the park. Through their Nongame Data Management System several, "special status species" were documented. These are discussed in detail in the Wildlife and Vegetation sections of this report.

The State Game and Fish Department also provided information and possible future cooperation with the County through their Hunter Safety Education program specialists and their Urban Fishing program specialists. In addition, the State Game and Fish Department is currently involved in protecting wildlife habitat along the Gila River corridor. The agency will be reviewing any plans the County Parks and Recreation Department chooses to implement in the Gila River floodway area to consider the effect on wildlife habitat.

Concepts generated for this Master Plan that effect the Gila River floodway were briefly reviewed with Arizona State Game and Fish officials during the planning process to identify pertinent issues. The State Department of Water Resources was also contacted to identify issues regarding the Gila River floodway area, and the possible utilization of water features.

The Arizona State Land Department was contacted early in the planning process to confirm ownership and development plans on state lands adjacent to the Park. Parcels were checked for development plans the state might have and for special leases or use permits that might have been issued on those parcels that could effect park development.

The Bureau of Land Management was also contacted early for the same reasons concerning federally owned land. Ownership and future development plans were checked to identify possible conflicts or opportunities with possible park development. Management Agreement possibilities with the BLM were also identified to the south of the park.

The Army Corps of Engineers is the designated federal agency for permitting or approving any development that occurs on land with the designation of "Waters of the United States". The Gila River as it flows through the Estrella Mountain Regional Park is a part of the "Waters of the United States". Therefore, the Army Corps of Engineers was contacted to obtain information about the permitting process, and to understand what park development plans would fall into the Corps' jurisdiction.

As can be expected, there are a number of agencies which will have some review and approval authority over the Estrella Mountain Regional Park Master Plan. Agencies likely to review plans include the Army Corps of Engineers, the State Game and Fish Department, the U.S. Fish and Wildlife Department, the State Department of Water Resources and possibly the State Department of Environmental Quality. Each of these agencies that review the Estrella Mountain Regional Park Master Plan will have specific concerns that will have to be addressed and specific requirements that may have to be met.

## B. NEWSLETTER

The major component of the public involvement process was the publication and distribution of newsletters. These newsletters updated the public on the status of the planning process and informed the public about upcoming public meetings. Six newsletters were published in all, the first being published in October of 1987. This newsletter introduced the project, the consultant team, and the objectives of the master plan process.

The second newsletter was published in November of 1987 to help draw general public participation into the process. This newsletter reviewed the status of the inventory and analysis portion of the planning process and announced the first public meeting to be held 2 December 1987 at the Goodyear Community Center. Local newspapers were also contacted for announcements of the public meetings.

The third newsletter dated January 1988 announced the second public workshop. The primary purpose of this newsletter was a call for public response and attendance at the workshop on 13 January 1988. This newsletter reviewed the first public meeting and listed recreation facilities being considered. Posters announcing this public meeting were also printed and put up in prominent locations in the Avondale and Goodyear area.

The fourth issue of the Estrella Mountain Regional Park newsletter was published in March 1988. This newsletter reviewed concerns and ideas expressed at the first two workshops and announced an opportunity to review alternative development plans for Estrella Mountain Regional Park. The third public workshop was held 16 March 1988 at the Avondale City Council Chambers. Again, area newspapers were contacted to help announce the workshop.

The fifth newsletter was printed and distributed in May of 1988. This newsletter announced the fourth public workshop scheduled 18 May, again in Avondale.

## C. PUBLIC MEETINGS AND CONTACTS

A total of five public meetings were held during the process of this master plan. Comments and suggestions were received from the general public through the first four workshops. During the first two workshops, site inventory and analysis information was reviewed and comments were received concerning new or additional recreation opportunities and facilities needed in Estrella Mountain Regional Park. These two workshops were held at the Goodyear Community Center on 2 December 1987 and 13 January 1988. The consultant team received numerous comments, including the following items and issues:

- Additional park security with expanded facilities

- Closing portions of the park due to low summer attendance
- Quality and quantity of water available needs to be improved
- Fishing and swimming or water feature opportunities needed
- Trail connections to Goodyear, Avondale and beyond
- Cost concerns possibly utilizing volunteers
- Generate revenue by concession, sports complex, RV park, food concessions
- Park activities and uses need to reinforce each other
- Preserving and protecting the natural desert environment
- Desert botanical exhibit and wildflower protection
- Radio controlled airplane site
- Large group camping areas needed
- Additional horse trails
- More family activities and sports facilities

During the third and fourth public workshops, alternative master plans were reviewed and public comments were received to help provide direction in selecting the best components of a preferred alternative. These two workshops were held on 16 March 1988 and 18 May 1988, both at the Avondale City Council Chambers. Again, important concerns were brought forth and suggestions were noted by the consultant team.

The following comments were voiced at these meetings in addition to the comments already mentioned at earlier meetings:

- Trail maintenance and desert degradation concerns if park developed further
- Positive response to alternative with less stringent fee structure
- Security and access concerns along the entire northern park boundary
- Positive response to alternative showing greatest shooting range opportunities
- Safety and noise concerns of residential area nearest shooting range
- An objection to concessions outside existing picnic loop
- Safety and cost concern with lake or water feature
- Positive responses to preservation oriented alternative

The final public meeting presented the final Master Plan as recommended by the planning team and approved by the Maricopa County Parks and Recreation Commission and staff.



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Mr. Mark Shepard  
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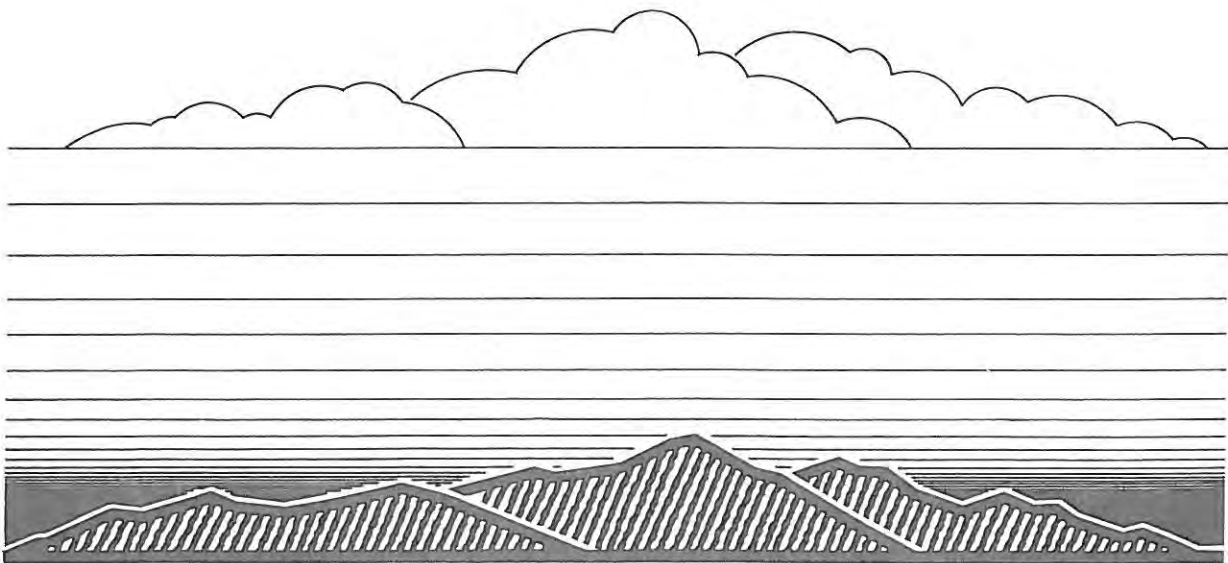
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# IV

## *Master Plan*



*Estrella Mountain Regional Park*  
*Long-Range Master Plan*



## A. ALTERNATIVE PLANS

Three alternative plans were produced to help raise, evaluate, and test a variety of issues and activities which were identified during the planning process. These plans thoroughly tested various activities, their locations, and their relationship to other activities. They presented varying degrees of development and intensities. They presented ideas and activities which realistically did not belong in Estrella Mountain Regional Park. These plans were simply instruments which triggered extensive discussion within the design team, County staff, and the public.

Through a process of extensive testing and discussion the appropriate activities, their appropriate locations and intensities came together to form the "best" alternative. This alternative again was thoroughly evaluated and tested as to how well it achieved the desired goals and addressed the projected needs. Further refinement of this alternative eventually evolved into the proposed Long Range Master Plan for Estrella Mountain Regional Park.

## B. PREFERRED MASTER PLAN

The primary goal in developing the Master Plan for Estrella Mountain Regional Park was to preserve and protect the unique natural and cultural features of this park, while at the same time providing those recreational activities best suited for this facility, in this location, within the Phoenix Metropolitan Area. To that end, the Master Plan envisions maintaining over 17,000 acres or 90% of the Estrella Mountain Regional Park total land area in its current natural state. While preserving over 90% of the environment that makes Estrella Mountain Regional Park so unique, the Master Plan provides for multiple opportunities for all ages to experience and interpret this resource and also recreate within Estrella Mountain Regional Park's unique environment.

Today, most of the existing recreational activities within Estrella Mountain Regional Park occur in some 500 acres at the extreme north end of the park. Visitors golf, picnic and camp in this area. There is also a small amphitheater and rodeo ring in this area and various trail heads. For the most part the 400,000 - 500,000 annual visitors experience only this 500 acres or about 2% of the total park site. An important aspect of achieving the primary goal of the Master Plan is to provide the means to get people into the park such that they can experience this resource.

The Master Plan provides for a number of hiking, biking, equestrian and auto trails into the interior of Estrella Mountain Regional Park. These various roads/trails provide the backbone of the entire Master Plan and offers facilities for all ages to experience Estrella Mountain Regional

Park. As part of this backbone system, is a new entrance with a new visitor contact station. In addition, suggestions have been made to realign sections of Bullard Avenue and Vineyard Avenue to facilitate traffic flow into the new Estrella Mountain Regional Park entrance. As the new Visitor Contact Station is moved into the park, the Master Plan also provides that some of the existing facilities at the north end of the park be phased out and moved internally, thereby opening up the entrance area to an appropriate uncluttered environment of a 19,000-acre regional park.

The proposed internal park road provides an initial 5.5 mile loop around and through some of the rugged terrain which exemplifies Estrella Mountain Regional Park. Off this first loop is a road which climbs some 500 feet through a small pass then drops into a flat area of pristine desert. Here the road connects to a second longer loop road providing access deeper into the interior of the park. Flanking this pristine lower sonoran desert environment is some of the most rugged terrain of the Sierra Estrellas. The second loop offers an additional 8-9 miles of both natural and cultural interpretive exhibits. This segment of road weaves through desert washes, alongside the vertical walls of the Sierra Estrellas and past various cultural sites including Hohokam camp sites, and a small Hohokam village site.

These various hiking, biking, equestrian and auto trails provide the means for all ages to experience and interpret the Sonoran desert vegetation, Hohokam culture, rock outcroppings, mountainous terrain, river bottom, and desert washes. Off this backbone system are located areas which provide recreational opportunities and visitor enhancements. Along the internal loop road system are numerous small picnic areas, some of which also provide trail head opportunities. These picnic areas will be provided with tables, grills, trash receptacles and ramadas.

There will be numerous camping opportunities providing facilities for individual, family, group and recreational vehicle camping. Each of these facilities will be provided with the appropriate enhancements which will contribute to the overall camping experience.

The existing rodeo ring is programmed to be enlarged and enhanced such that an equestrian center could be established offering stables, horse rental, trail rides, and arena or show areas. This facility would act as the trail head to numerous equestrian trails throughout Estrella Mountain Regional Park, areas to the south, and through the adjacent residential community of Estrella.

The most dramatic facility which the Master Plan proposes is an education/conference center located in the south central portion of Estrella Mountain Regional Park. This facility is located in a small isolated natural canyon which has a fairly flat floor and almost vertical sides. Once inside this canyon, there is a total sense of remoteness and one has absolutely no idea metropolitan Phoenix is only a few minutes away. Within this canyon a facility which offers the opportunity to study the natural and cultural aspects of Estrella Mountain Regional Park on an extended stay is proposed. This facility would be programmed for various scouting or educational groups or possibly small conferences and/or retreats. To insure this facility retains its remoteness, there



would be no public road system and participants would be encouraged to hike or horseback ride in. As this facility is further refined and as interest increases, the decision would be made as to how primitive or lush the facility itself should be.

Other facilities which the Master Plan proposes are:

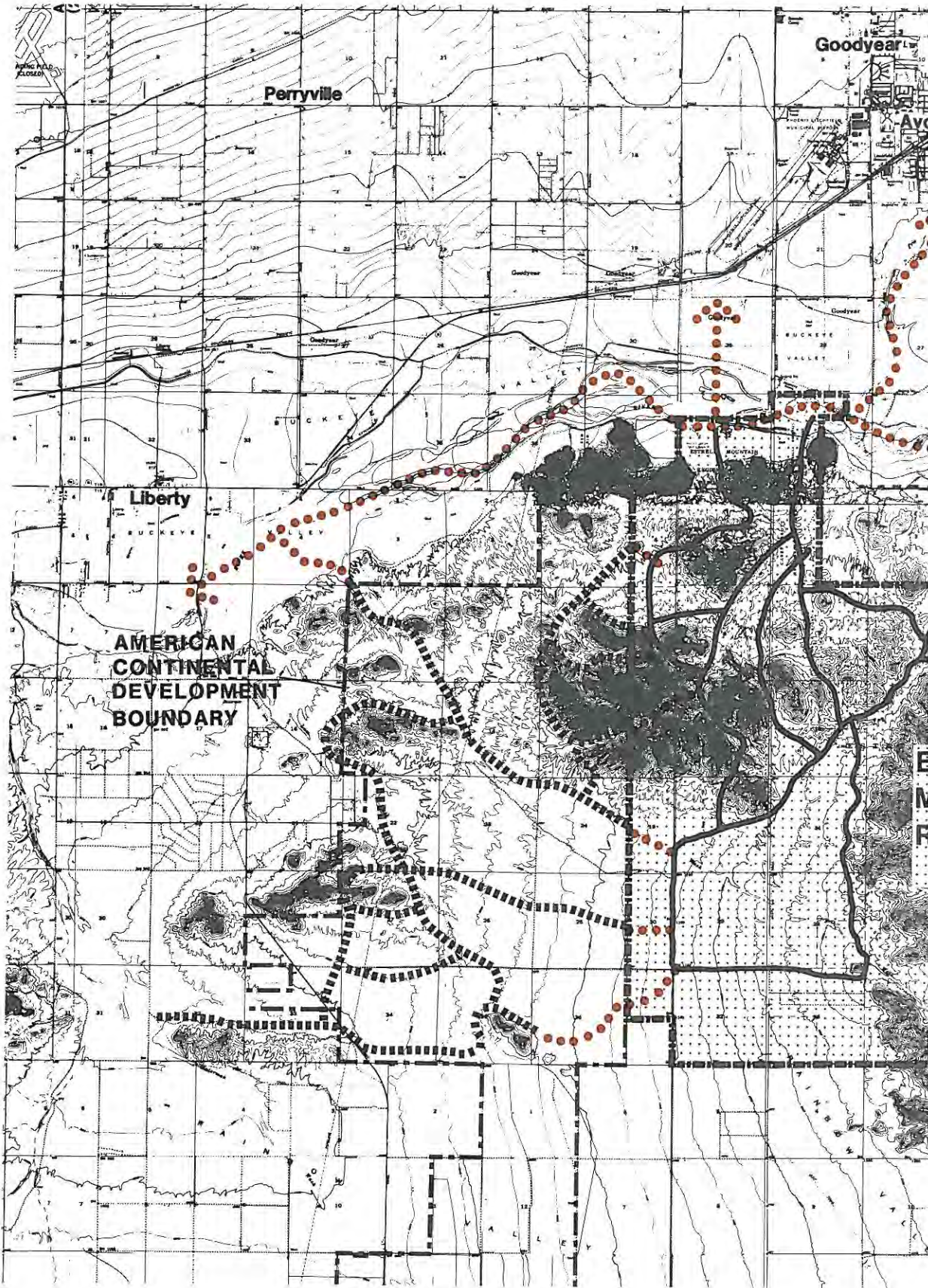
- a number of lookouts or vista points which offer panoramic views of metropolitan Phoenix
- a new ranger station which includes a residence for a full-time, on-site manager
- a new maintenance and operational complex
- two potential exit points to provide ease of exit and could possibly be utilized as entrances for special occasions
- convenience store which provides various user services
- model airplane site to accommodate local interest
- shooting range for Maricopa County Sheriff's Department and the general public
- future site of an expanded Sierra Estrella Golf Course offering an additional eighteen hole course.

The existing developed north portion of Estrella Mountain Regional Park will undergo a substantial change (Figure 19). As previously described, a new entrance road will be developed slightly east of the existing access road to the golf course. Located along this new entrance road will be the new contact station some 2,000 feet off Vineyard Avenue. This new contact station will provide the visitor with his first image of Estrella Mountain Regional Park. The new contact station will provide the visitor physical contact with the Estrella Mountain Regional Park staff and the opportunity to ask questions and be provided with information describing the various activities which the park has to offer. Group picnic sites and camping sites would also be assigned at this contact station.

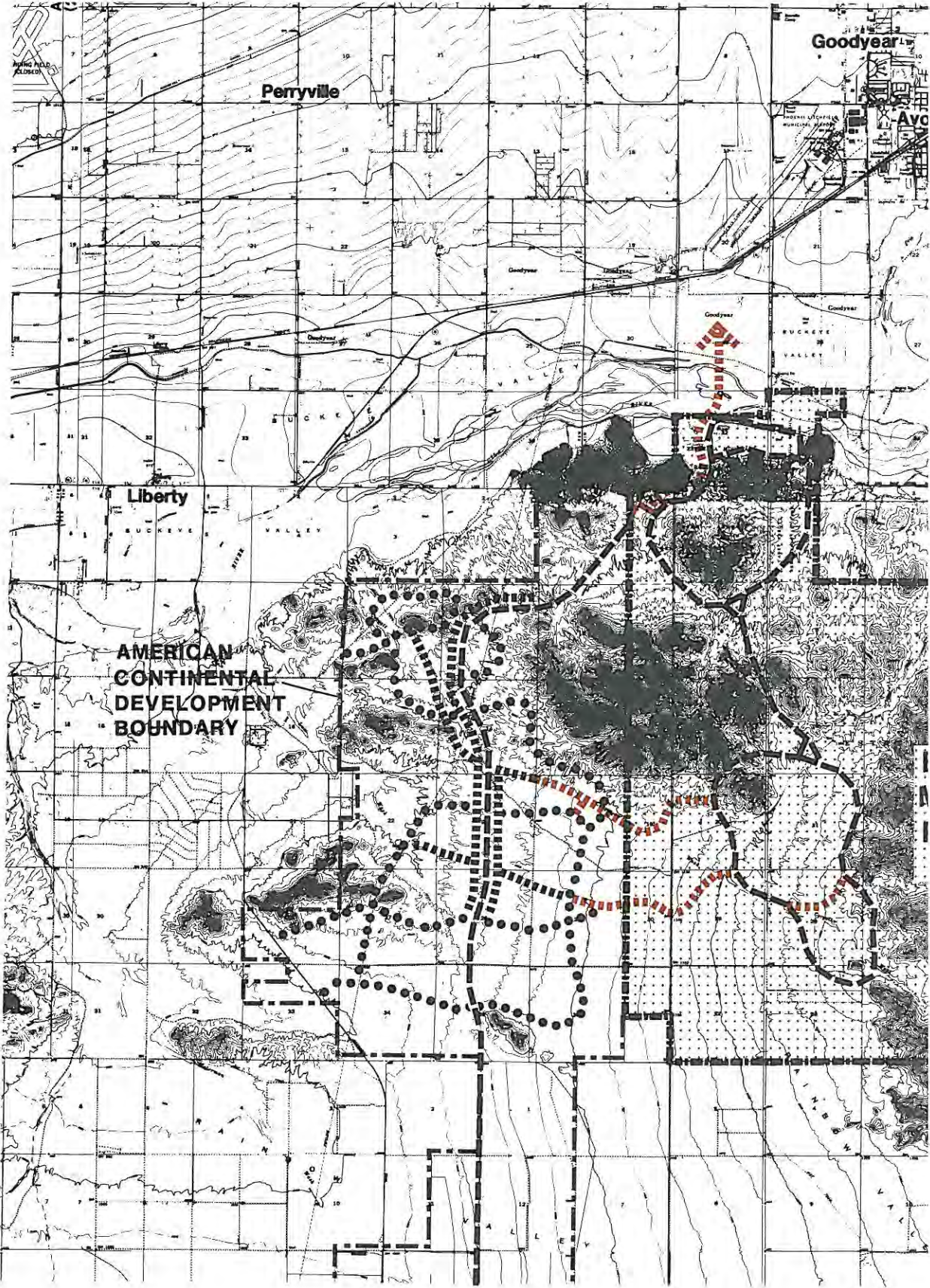
Located along the east side of the new entrance road is a new swimming facility. The activity which was requested by more people was a water feature providing swimming and fishing opportunities. The swimming facility would be a man-made facility with a combination of hard edge and irregular edges. It would have a concrete bottom and edges in the more structured part of the "pool" and a plastic liner with sand in the irregular portions of the "pool". This facility could provide competition events in the structured part and supervised play in the informal portion. The facility could be provided with a water slide and fountains. The facility would be equipped with filtration equipment and would have to conform to the appropriate health and building codes. Adjacent to the pool area would be limited picnic facilities and ramadas. In addition, changing and restroom facilities would be provided. This facility would be utilized both by day users and campers.

Another water feature would be provided for in the form of a 15-20 acre "lake" within the river bed. This lake would also be man-made with an irregular shoreline. It is anticipated that with today's shallow water table the lake would be dug to a depth to utilize groundwater. In addition, it is proposed to utilize the existing flows in the river and waste from the Buckeye Irrigation channel. Working with the Maricopa

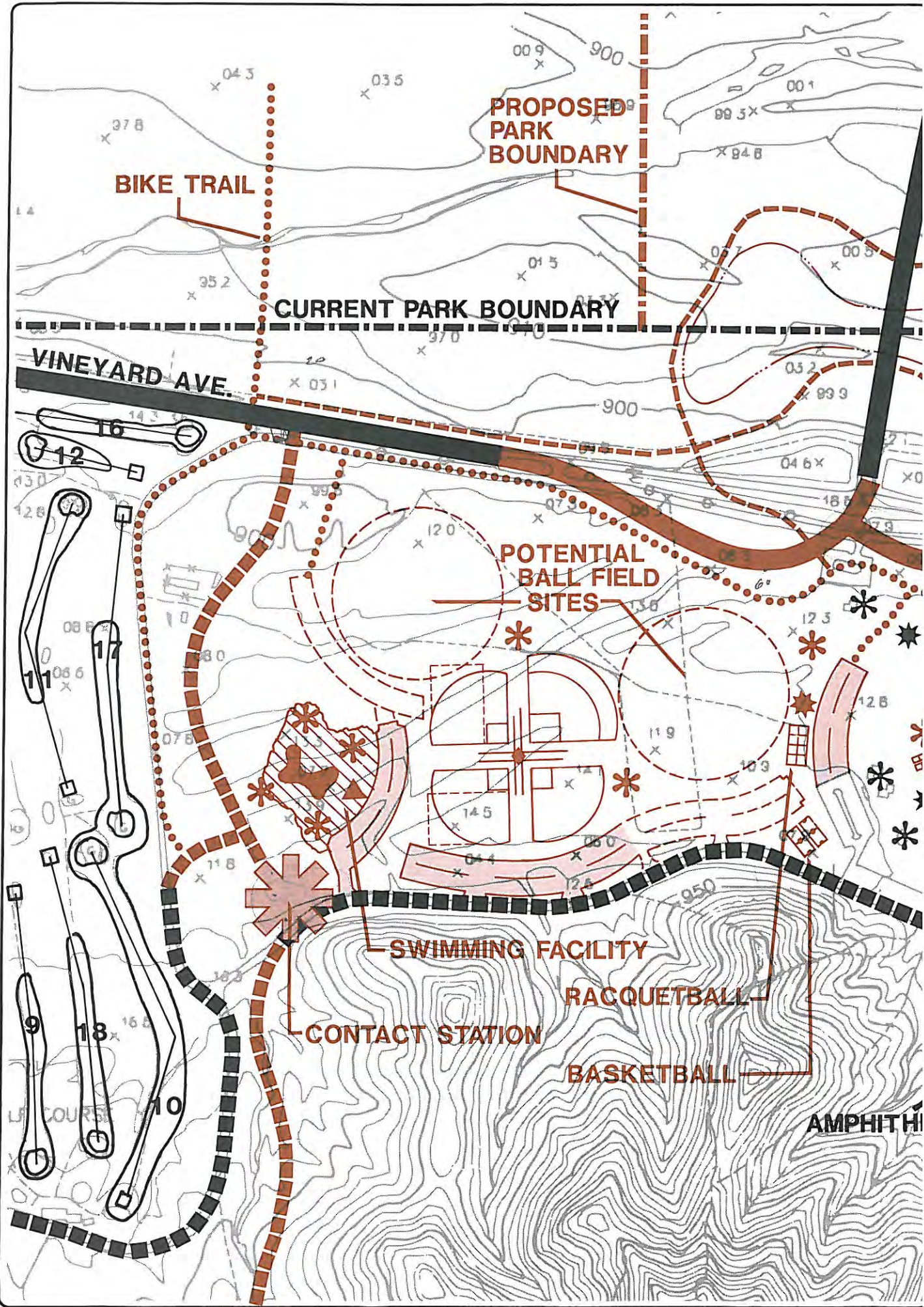












**PROPOSED  
PARK  
BOUNDARY**

**BIKE TRAIL**

**CURRENT PARK BOUNDARY**

**VINEYARD AVE.**

**POTENTIAL  
BALL FIELD  
SITES**

**SWIMMING FACILITY**

**RACQUETBALL**

**CONTACT STATION**

**BASKETBALL**

**AMPHITH**





County Flood Control District it is recommended that their 80-100 foot wide channel project be located to the north with the lake being developed to the south, all within their 1,000 foot wide channel improvement program. With their construction project, the 40-50 year flood would be accommodated within their channel. It would be anticipated that the 100-year flood would probably destroy the lake and shoreline but, given the frequency, it would be a justified expenditure. Around the lake, informal hiking and biking trails would be established to provide the user with the opportunity to experience the ecosystem of the river bottom and associated environment. It is proposed that Maricopa County Parks and Recreation Department work closely with the Arizona State Fish and Game Department to obtain funding for an urban fishing program for this water body.

The Master Plan also proposes for the northern portion of Estrella Mountain Regional Park a major sports complex of some 50 acres. This sports complex would include softball fields, football/soccer fields, volleyball, tennis, basketball, racquetball and playgrounds. This facility would also have a full service concession stand and restrooms. This facility could be expanded to ultimately provide 12 softball fields.

This sports complex is being proposed for Estrella Mountain Regional Park because this area has seen dramatic growth over the last few years and will continue to see sustained growth for the next couple of decades. With this increased growth the local municipalities are unable to accommodate the larger more active recreational activities. This area of Estrella Mountain Regional Park can accommodate these functions. In addition they will support and enhance other park functions. This complex, however, should either be provided and operated by a concessionaire or jointly developed and maintained by the local municipalities and the County. It is an activity which should not be undertaken solely by Maricopa County.

The Master Plan, as proposed, anticipates being implemented over a period of years and anticipates ultimately serving the needs of the public by the Year 2005. This Master Plan must remain flexible to accommodate changing conditions. It must also accommodate and anticipate various funding sources and/or concessionaires. Every possible facility should be funded and/or operated by outside concessionaires.

### **Water Feature Concept**

The area along the Gila River has a long history of being utilized by the local residents. The water that once flowed year around in the Gila and Salt Rivers allowed several different native American cultures to survive and even thrive here in the desert. The rivers were followed by European and American explorers and pioneers as transportation routes. These rivers and their wooded banks provided both water for consumption and shade for residents and travelers.

Through the years large dams were built on the upper Salt and Gila Rivers for a variety of water uses and irrigation canal projects. These projects eventually stopped the river's surface flow except for more localized rainfall runoff. This and other intervention by man has caused

some significant changes to the natural ecosystem along the river as the river's flow dwindled. The large cottonwood groves and relatively dense vegetation along the river banks began to disappear or were cut down to conserve usable water.

Controlling the rivers and using the water elsewhere enabled the "Valley" to grow and prosper. However, the natural riparian landscape, along with some of the natural resources associated with a riparian plant and animal community have been lost. Today the County and local communities surrounding the park have an opportunity to restore a small portion of the former Gila River landscape. To restore it to a more accurate reflection of the character and experience the river corridor provided before the intervention by white man in this portion of Arizona.

Today the growth of the Phoenix metro area and the need for quality recreation and open space is bringing a focus specifically back to the southwest Valley. There is now an opportunity to turn a portion of this park development project into a restoration project. A pocket of the Gila River at a very critical location along its path could recreate a landscape that would provide visitors a more accurate picture of the landscape that the native Indian cultures lived in and that early settlers found in the river bottom on arrival to the area. There is an opportunity to provide a living educational landscape, illustrating the importance the flowing river once played in the Valley and illustrate the kind of oasis the river once created. This recreated landscape could help visitors better understand the development of Phoenix and why settlements and transportation routes followed the river.

A mind set that says "this is the Arizona desert; water doesn't belong in this park" is not historically accurate. This overlooks what man's past intervention in the landscape has done to the river's ecosystem. Water, historically, does belong in this park in the form of a river that flowed year-round. This continuous flow was also quite generous. The width of the stream of the Gila River recorded in 1868 was approximately 680 feet. Until the early twentieth century both the Gila and Salt Rivers flowed year-round through large groves of cottonwoods. The predominately dry riverbed and absence of large trees is only a recent landscape. A treeless, dry riverbed is not the "natural historic" landscape for the Gila River. An attractive, cool, shaded, very usable oasis area within Estrella Mountain Regional Park is not artificial or contrived in a historic context. Historic precedence, ground water recharge, recreation user demand and aesthetic park design principles can all work together in the Gila River bottom area to create an outstanding water oriented facility in Estrella Mountain Regional Park.

### C. CRITICAL ISSUES FOR THE FUTURE

There are a number of issues which will have to be addressed in the future. These issues relate to development within Estrella Mountain Regional Park and decisions made by other public agencies which may affect Estrella Mountain Regional Park. These issues are as follows:

Land Use - Land use decisions made by the local municipalities could have substantial impact upon Estrella Mountain Regional Park. While present land use plans indicate the proposed uses around Estrella Mountain Regional Park are primarily residential it will require the Maricopa Parks and Recreation Department to follow land use decision and zoning cases to insure what is planned for, occurs in an orderly manner. The most important aspect regarding the surrounding land use however, will be how this residential land is served by roadways. It is essential that future roadways do not run parallel and adjacent to Estrella Mountain Regional Park boundaries. Any adjacent roadway only provides more opportunity for park vandalism and destruction, and will only increase the need for more staff and policing. The Parks and Recreation Department should follow any zoning case on adjacent lands to insure that residential lands next to Estrella Mountain Regional Park are properly planned and designed.

Southwest Estrella Mountain Regional Park - The southwest quadrant of Estrella Mountain Regional Park will, in the future, experience a number of pressures which must be thoroughly understood and resolved.

Initially this area is being looked at for possible land trades to increase park lands in other County facilities. It is not the purpose of this discussion to rationalize whether Estrella Mountain Regional Park land is any more or less critical than other potential County land. It is important, however, to think through how much land could be traded.

It must be assumed that any land traded away from Estrella Mountain Regional Park would become developed through the private sector and most likely become residential land. The amount of land traded away should be based upon providing sufficient buffer from the proposed southern loop park road. To provide an opportunity to take the visitor, from the park entrance, leaving the urban environment behind and lead him through some of the most pristine and rugged terrain only to bring him past more urban development defeats the whole rationale behind providing this experience. The amount of land between the park road and any new boundary line is critical. Final boundary location must take into account topography, vegetation, and noise. Final boundary location must be well thought out and should be irregular. It would make more sense to initially describe a general location for the new boundary and not finalize it until the new landowner/developer has a preliminary plan or layout. It would be to the benefit of both parties that the boundary be irregular and conform to the topography, the park's development layout, and sufficient distance from the park loop.

If the southwest quadrant is not utilized for land trades, it will experience another pressure. As development occurs along the western boundary of Estrella Mountain Regional Park this relatively flat terrain of the southern quadrant will be looked at to provide more urban recreational facilities. As the residential community of Estrella continues with their design approvals and construction, community park opportunities will be lost. If the City of Goodyear is unable to obtain, through either purchase or dedication, the large 100 plus acre sites which can accommodate the large, active, urban recreational activities, Estrella Mountain Regional Park will come under extensive pressure to

provide those functions. Again, it is not the purpose of this Master Plan to make policy decisions for the Maricopa County Parks and Recreation Department but to point out that these decisions will be required.

The concern with urban type recreational facilities being developed in the southwest quadrant raises some old issues and raises new issues. Providing sufficient buffering to the internal park loop road is still essential and again will require some specific design and assurance that potential future activities will not adversely effect the purpose of the scenic auto tour and hiking, biking and equestrian trails. The new issue which is raised is that of access and control. New recreational activities in Estrella Mountain Regional Park in that location will put pressure on the Parks and Recreation Department to provide a secondary access into Estrella Mountain Regional Park from the southwest. Additional access increases the need for park staff and will reduce control. In addition, inviting increased activities and people to areas immediately adjacent to Estrella Mountain Regional Park increases the likelihood of vandalism.

Whatever new pressures the southwest quadrant experiences, they should be evaluated as to whether any detrimental effect will be imposed on Estrella Mountain Regional Park, and can the programs envisioned by the Master Plan still be implemented.

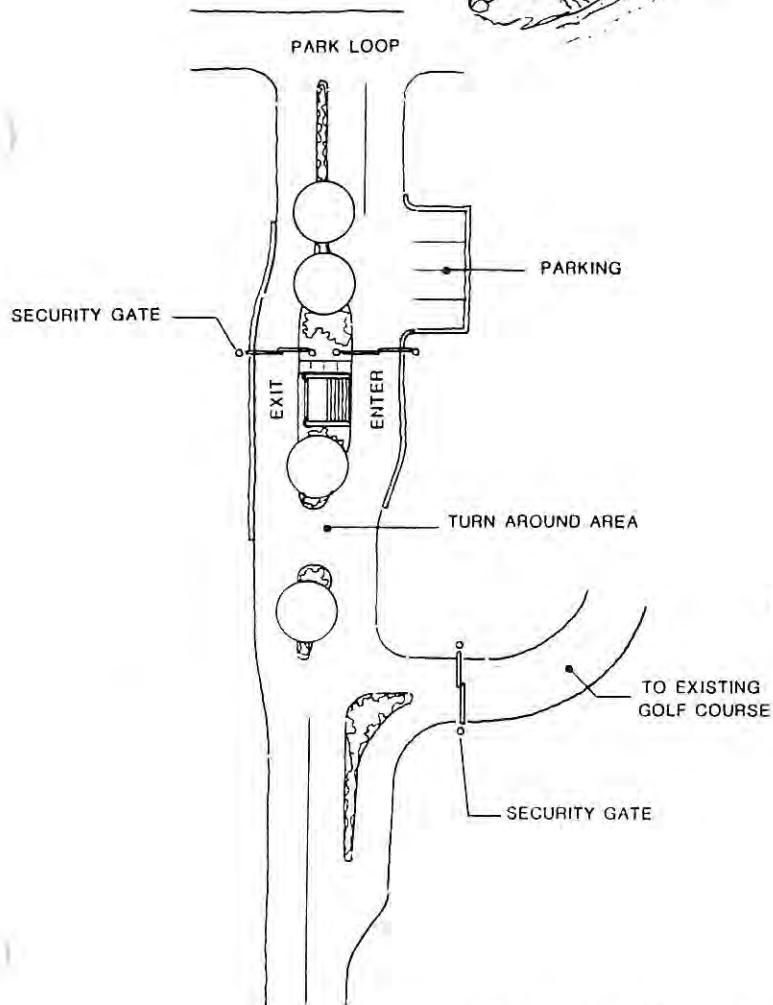
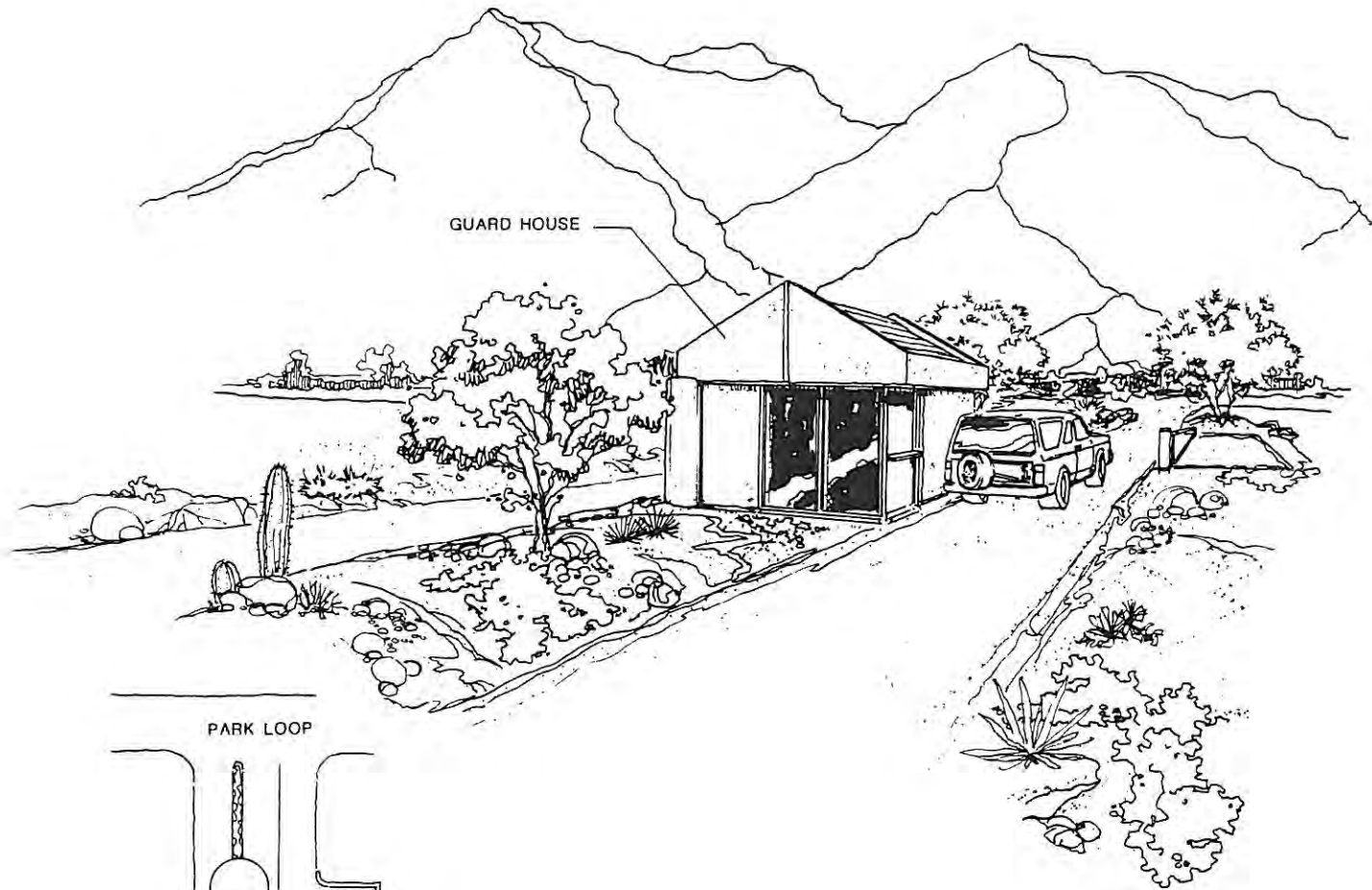
#### **D. DESIGN CRITERIA**

##### **1. General**

The intent of this section is to establish general design criteria and design materials that will be used throughout Estrella Mountain Regional Park. Siting of all facilities is extremely important to the visual character of the park. In all cases, the scenic and natural qualities of each area must be preserved and enhanced. Siting of recreational facilities must include appropriate buffer areas between different uses and activities. Each activity will have a different buffer requirement and a different spacing requirement, depending upon the existing terrain, views and vegetation.

##### **2. Roads and Parking Areas**

A road or parking lot which blends into the land is a necessity. Access roads into sites influence the attitude the visitor has toward that site. Road alignments within the park can unite use areas or become undesirable barriers, as when they are placed between a playground and picnic area. Parking lots must also blend into the natural terrain. The ease with which the visitor enters, leaves, parks his car and experiences the site is extremely important. Plant material will be used to provide shade and reduce apparent size of large areas. Mounds or recessed areas will be designed to reduce visibility of parking areas. Consideration must



# Contact Station

be given to pedestrians and how they will leave and enter each area. In order to minimize visual disruption of natural terrain and maximize use of facilities, final design of such facilities as parking areas should accommodate an average level of use. There is no need for large infrequently used parking areas where overflow or peak levels of parking can be designed as grassed areas. Overflow parking areas must be thoroughly thought out and planned for.

All public use park roads and parking areas will be paved all-weather roads. This will reduce maintenance costs and provide better control of traffic flow. Design of roads shall conform with "Standards for Maricopa County Parks Roadway System" adopted January 1984, as amended. All parking stalls must be delineated so that there is no confusion on the part of any visitor as to where they should or should not park. Ninety degree (90°) parking is preferred as it utilizes less land and can be used for pull through operation for large units. Locations of all paved areas must respond to soil conditions and existing terrain.

### 3. Trails

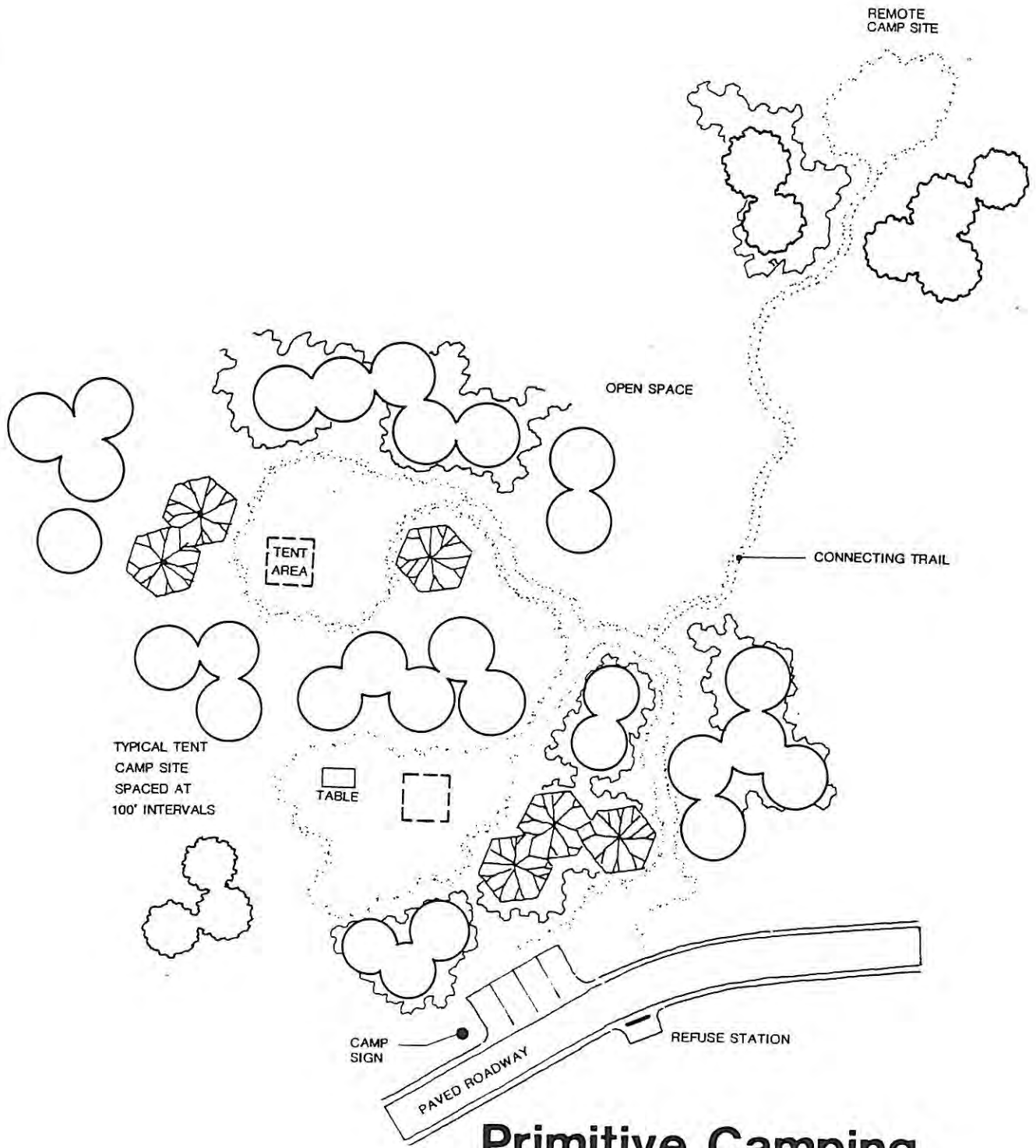
There are a number of opportunities for trails at Estrella Mountain Regional Park, including general circulation, links between recreation areas and natural area trails. Design of trails will depend largely upon usage and the land usage through which the trail is built. There are generally two types of trails which will be utilized.

The first type of trail will be more informal. It is the type of trail leading through natural areas and away from development. These trails would be less defined, and will be constructed of gravel, dirt or whatever material is present in the landscape.

The second type of trail is the more formal, intensive use trail found in developed areas. These paths will be hard surfaced since they will experience heavy use. These trails connect major use areas and facilities to parking areas. Care must be taken in laying out these trails as the shortest, most convenient connections so that they will be used. Trails connecting different recreation use areas in close proximity to each other can also be expected to receive heavy use from hikers and bikers.

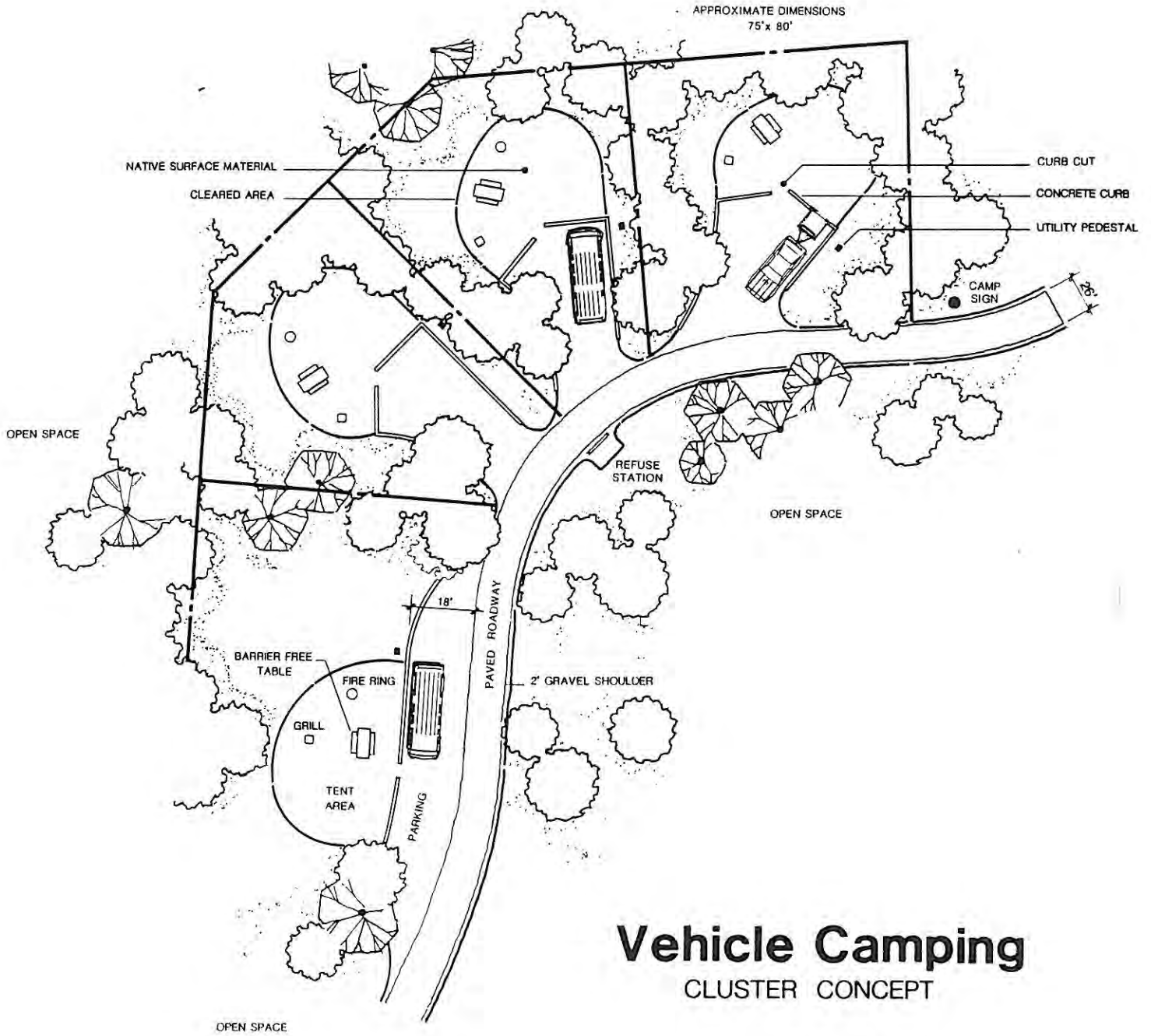
### 4. Camping Areas

Many changes have occurred in camping patterns in recent years. Most notably are the changes and improvements in design of outdoor recreation vehicles and camping equipment. There are those campers who enjoy "roughing it" through primitive camping and enjoying the natural environment. These include Scout groups who are being exposed to the experience of camping and are being instructed in camping skills. There are other campers who are less interested in nature and are actually looking for social contact. Contact with other campers is enjoyable and this is their basic form of recreation. These campers are less interested in "roughing it", and will spend as much for comfort as they can afford.



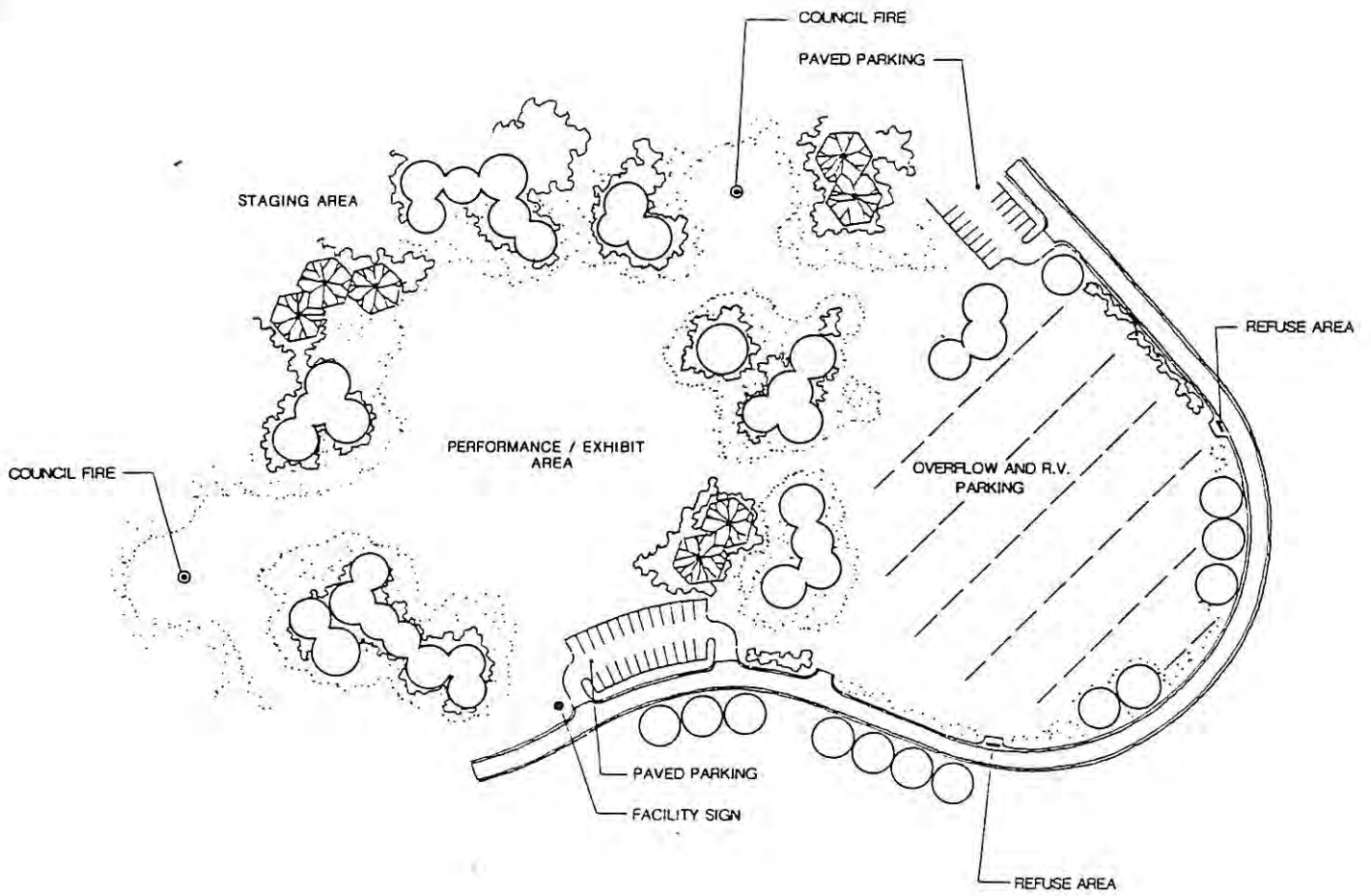
# Primitive Camping

OPEN SPACE



ESTRELLA PARK MASTER PLAN MARICOPA COUNTY ARIZONA





# Vehicle Camping

## GROUP FACILITY

ESTRELLA PARK MASTER PLAN MARICOPA COUNTY ARIZONA

Campgrounds must be planned to accommodate the needs of both groups. The needs of each group are different and thus each area must be designed accordingly. The main difference between the two camping areas will be improved campsites vs. unimproved campsite or the degree of improvements.

There should be a few areas set aside for primitive camping. These areas shall be remote and designated mainly by an area which is remote from any roads and will be accessed by either foot or horseback. To insure that the fragile environment is not destroyed each primitive campsite should consist of a small cleared camping area with the standard fire ring. No utilities will be provided and trash dumpsters will be located in the parking areas which are located off the principal park road. Campers will be required to pack everything out they bring into the camp area.

The more "social" camping areas will consist of formal, improved camp areas designed for either the individual or family camping, or group camping. All of these camping areas will also be located off the principal park road and internally served by a two-way paved special purpose park road. The family camp area will consist of improved campsites designed utilizing the current County standards with each campsite consisting of a paved parking area and cleared tent area with a fire ring, grill, and table. Each campsite will also be provided with electrical power and potable water. For each group of approximately ten campsites a comfort station will be provided which will consist of wash basins, flush toilets, and showers, which connect to a drain field. Within each camping area there should be a few "host" campsites for area control, which provide sanitary hook-ups, again connected to a drain field and an appropriate number of central dumpsters to accommodate the needs of the area.

The other "social" camping facility needs to accommodate group camping. Currently, there are demands from large groups which request numerous campsites for short intensive stays within Estrella Mountain Regional Park. These groups will continue with their usage of the park and accommodations need to be provided. Group camp areas should be less formal with paved compound parking areas, cleared tent areas, and scattered fire rings. For each group of approximately twenty campsites should be a central ramada with picnic tables and grills. Electricity and potable water would be provided at these central ramadas. Comfort stations providing flush toilets and showers should also be provided for each group of 20-30 campsites. Group camp areas should also provide a large 200-300 foot square open play area. This area does not need to be a formal grass area but should simply be left open and cleared. This area can then also be utilized for overflow necessitated by occasional large groups.

## 5. Picnic Areas

Again there are two types of picnickers who need to be accommodated. The individual or family picnic area should provide an area remote from the principal park road serviced by an internal special purpose park road which is paved and provides for individual



# Picnic Grotto

parking alongside the picnic facility. Each picnic facility consists of picnic table and grill. Central dumpsters will be provided in appropriate locations. Within the family picnic areas there will be a few scattered small ramadas and comfort stations will be provided for each group of approximately 20 picnic sites.

Group picnic areas will be provided with a central paved parking lot and group picnicking centered around large ramadas consisting of concrete paved areas, tables, and grills. Appropriate combinations of ramadas, paved areas, tables, and grills should be designed to accommodate groups of ten to 50-60 people. Groups larger than 60 will simply be assigned to more group areas.

In all picnic areas a central dumpster will be provided for trash. Comfort stations will be provided to accommodate generally each group of 20 picnic units. At each comfort station potable water will be provided. Hose bibs can also be provided at the larger group picnic ramadas.

There will always be the occasional very large group which requires extensive facilities for either picnicking or camping. As each request is received park staff must first evaluate if their needs can be accommodated by the existing facilities. It makes no sense to build facilities which will accommodate massive groups. Since all camping and group picnicking is done on a reservation basis, large groups can usually be accommodated by simply assigning more areas. The very large groups will need to be accommodated in the more developed north end of the park where the facilities are and will be designed to handle more intensive use.

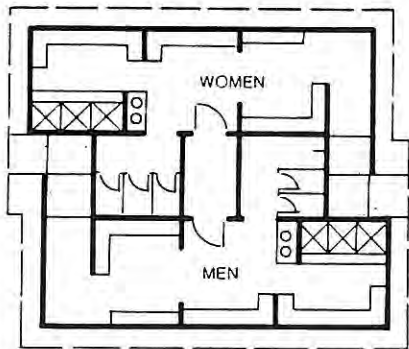
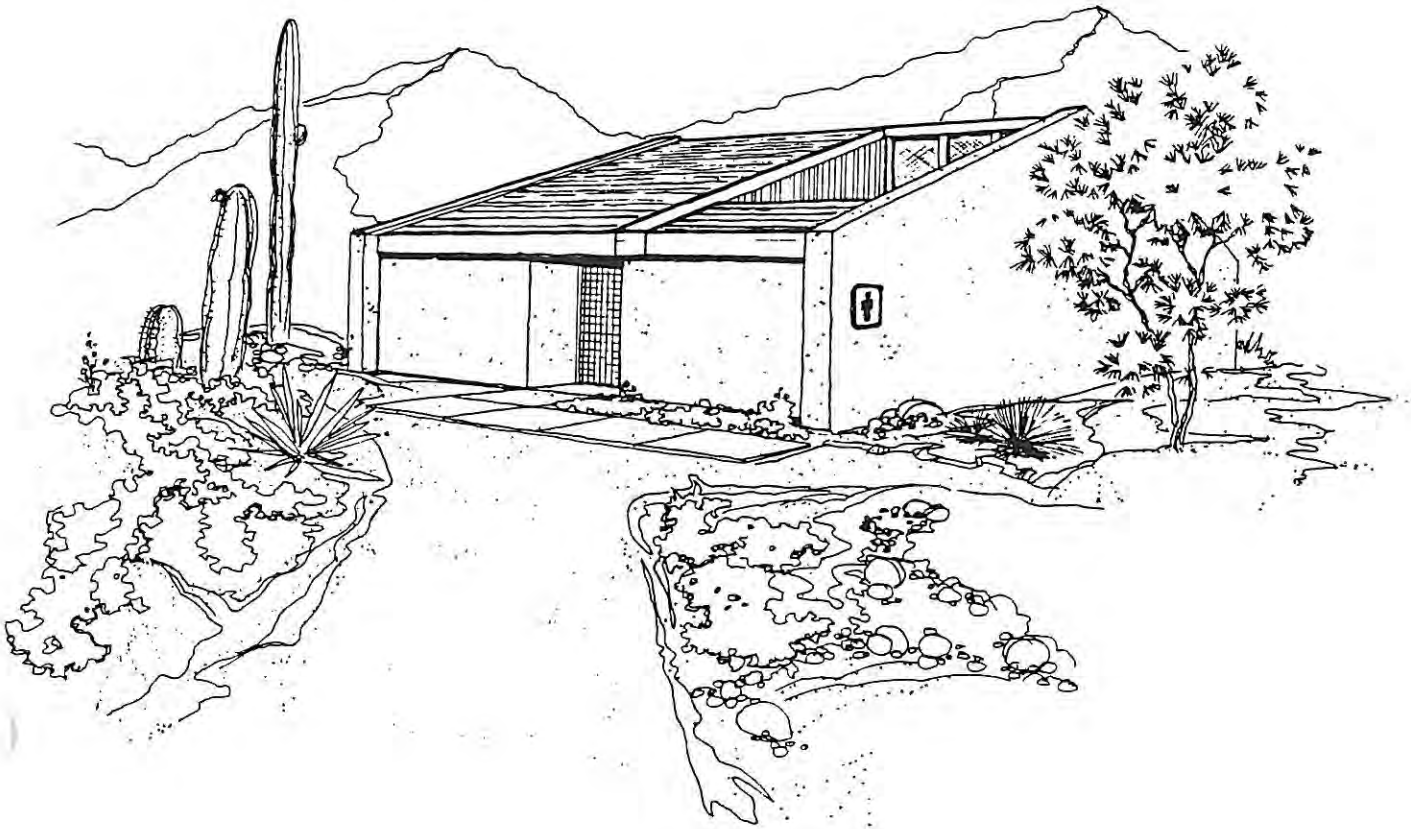
## 6. Building and Structures

The various types of buildings and service structures to be built throughout the park must be carefully designed to meet their required function and be visually compatible with the natural character of the terrain. Key buildings, such as the park headquarters, the education/conference center and the entry station, should be clearly visible but still utilize natural materials. Other buildings, such as maintenance compounds, should be unobtrusive in design and as "invisible" as possible to park users. All utilities will be underground.

Other facilities, such as ramada structures in picnic areas, will be designed and built from a consistent choice of wood, stone, concrete and/or masonry. All facilities that receive heavy use must be durable in both use and appearance.

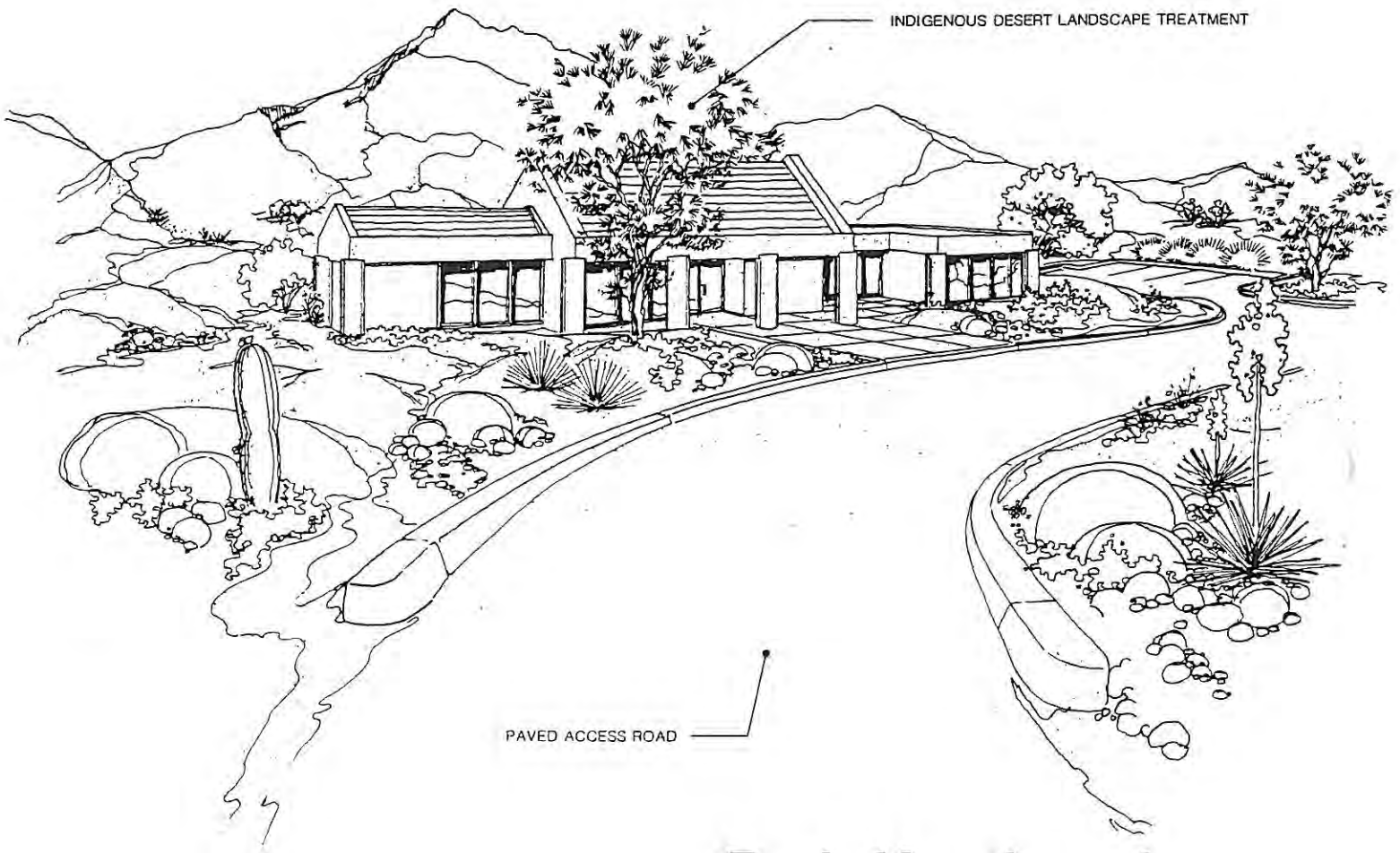
## 7. Landscaping

Landscaping will be used to solve functional problems and enhance the natural landscape. Plant material will be used to help define use areas and direct pedestrian movement and vehicular movement. It will also be used for windbreaks and screening from the sun, both of which are very important during the summer months. Plant material

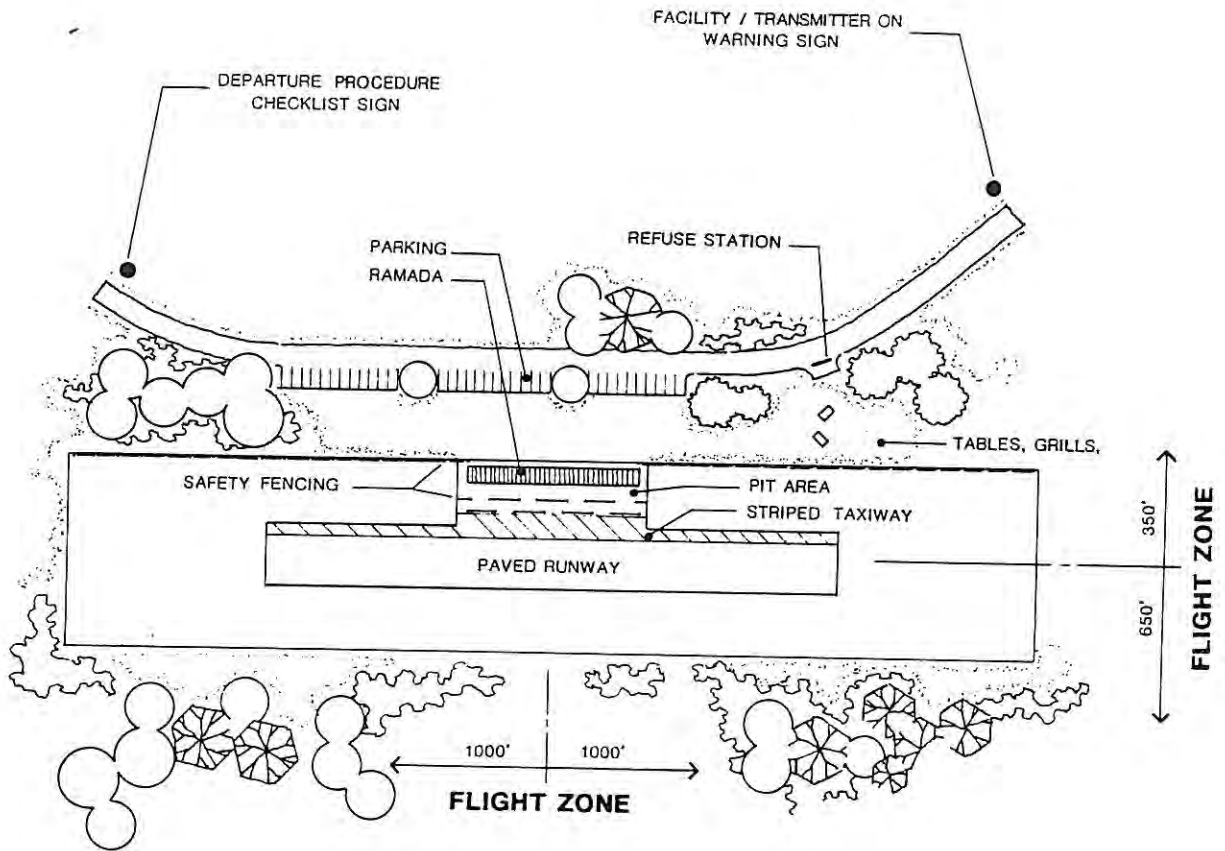


# Campground Restrooms

WITH SHOWERS



## Park Headquarters



## R.C. Model Airport

WITH PICNIC AREA

will be used in informal or natural settings, with a minimum of any clipped or manicured lawn areas except in high traffic areas, i.e. play fields, sports areas, etc. Native species such as acacia, paloverde, mesquite, ironwood, saguaro and other cactus, creosote, salt bush, desert broom, and other shrubs and native grasses will be utilized throughout the park.

## 8. Signage

Major entry signage monuments will be established at key entry points to Estrella Mountain Regional Park. These will serve to identify the park and establish a distinct image, through design with natural materials, consistent with other park structures and the natural character of the entire area.

Project signs will be standardized throughout the Park. They will be constructed of natural materials such as wood, concrete, or stone. International symbol signs will be utilized in all areas or, as required, standard highway signage. These signs require less time to understand and react to, they are more attractive and are universally understood. All symbol characters will be taken from Henry Dreyfus's "Symbol Sourcebook."

Entrance signs provided at each recreation site will provide information as to what activities the visitor can expect to find. These sites will also incorporate a locking gate which can be used to close the area. Sign format, colors, and symbols will be standardized throughout the project. This sign format will also be utilized in project signs placed along routes approaching the park.

## 9. Elderly and Handicapped Access and Use

All public use areas and project buildings will be designed with the elderly and handicapped visitor in mind. Any new facilities will meet Federal and State law requirements such as designated parking stalls, building access and facilities access, and area walks and ramps will be at gradients that are easily negotiable for the handicapped person. Other barrier-free considerations will include facilities that are easily reachable by wheelchairs. These will include drinking fountains, telephones, barbecue or fireplace units, paved beach sections, paved camping pads and certain physical recreational facilities.

Within designated areas, paths or portions of paths will be designed to accommodate the blind. This can be accomplished through surface textures or guide trails. Interpretive signs will provide descriptive text in both written and braille form to accommodate the sighted and unsighted public. During the development phase of the individual areas, continuing efforts will be made, where feasible, towards innovative ways of providing outdoor recreational facilities for all handicapped people.



## 10. Furniture and Equipment

There are a number of other visitor amenities which will be utilized throughout the areas. By the use of uniform design and materials throughout, project unity will be achieved and operation and maintenance costs will be reduced or kept to a minimum. Use of standard materials and parts throughout also reduces quantities of types of replacement parts required for maintenance.

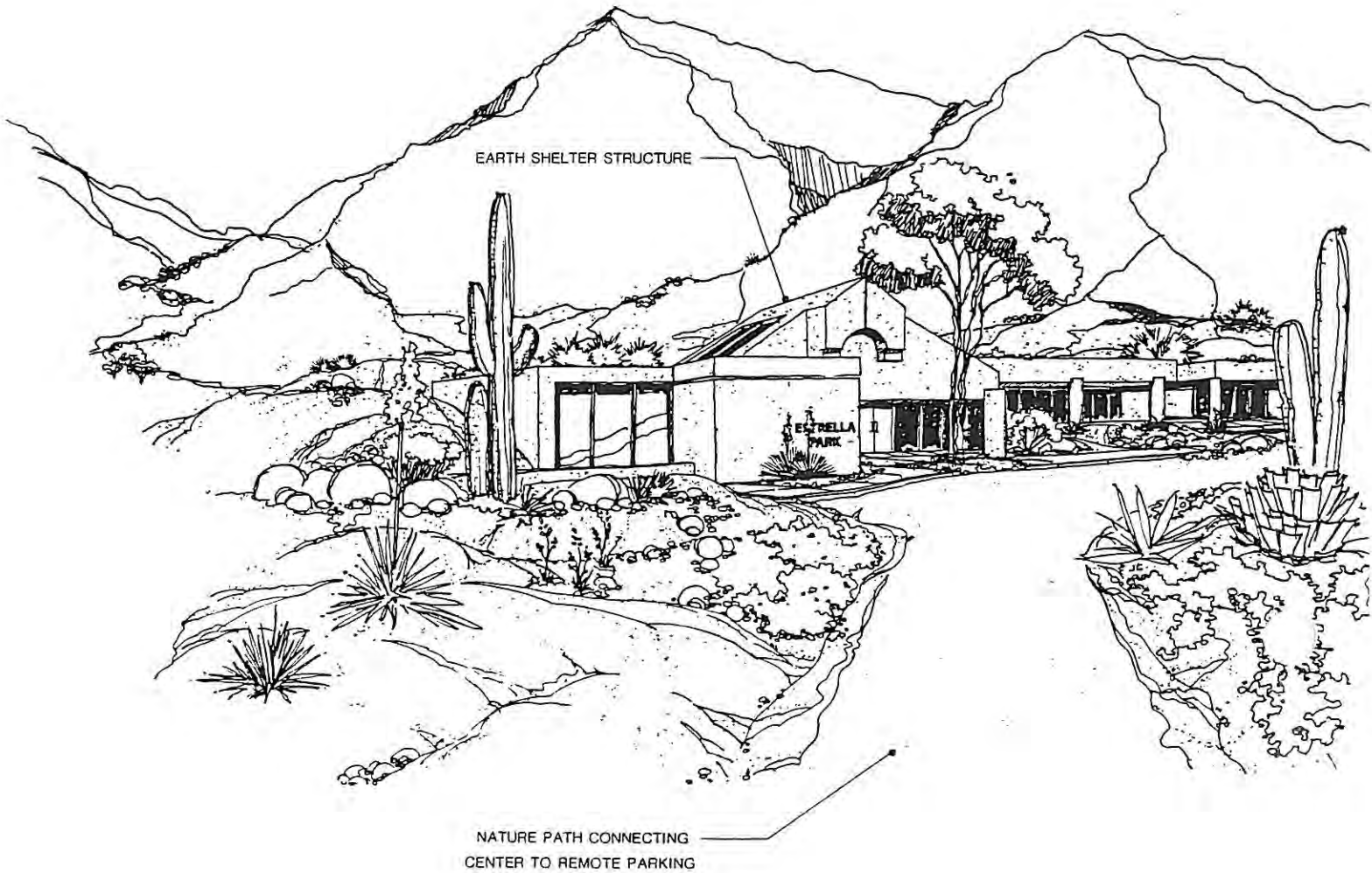
Benches and tables will be constructed of concrete and slumpblock. Units must be rugged enough to withstand heavy usage. Fire rings and camp fire areas must be designed to be easily cleaned of ashes. The existing design presently being utilized at Estrella Mountain Regional Park shall be standardized throughout.

Playgrounds shall be included in all major intensive-use recreation areas. Each playground will be designed individually as an integral part of each site. Consideration will be given as to placement and provisions for informal supervision. Areas and equipment should be programmed for two age groups: preschoolers, or up to age 5-6, and school age, up to age 10-12. Playground equipment will be prefabricated wood and metal structures as offered by several manufacturers. The surface of playgrounds should be sand and well defined from other use areas or turf.

Trash receptacles will be designed so that they are rugged yet easily maintained. They will be of a consistent design so that they are easily recognizable and used.

Bike racks will be programmed into each different recreation use area of the park. These racks will be located adjacent to bike paths and will provide secure areas for bicycle parking.

Kiosks are encouraged at strategic locations in recreation areas. They need to be more than bulletin boards attached to new buildings. They will be utilized to keep the public aware of rules and regulations, point out items of interest and used by campers for meeting notices, etc.



## Education Facility

ESTRELLA PARK MASTER PLAN MARICOPA COUNTY ARIZONA

## E. BOUNDARY ADJUSTMENTS

### MANAGEMENT AGREEMENTS, ETC.

In evaluating the current boundaries of Estrella Mountain Regional Park and adjacent development, several possible land trades or adjustments should be evaluated by the Maricopa Parks and Recreation Department.

The most important parcel that should be obtained is the Girl Scout property, which includes all of section eight in the northwest portion of the park. This section remains the only inholding within the borders of Estrella Mountain Regional Park. This parcel is a very attractive piece of property for development and is strategically located within Estrella Mountain Regional Park. The majority of this 640 acre parcel is flat and easily developable. The easiest route through the foothills to access the southwest portion of the park also must pass through this parcel. The County Parks and Recreation Department should continue its current efforts to obtain this parcel through an internal land exchange.

The second area to be considered is in the northwest corner of the Estrella Mountain Regional Park property. When the new Estrella Parkway was constructed, its alignment cut diagonally through the Estrella Mountain Regional Park and the King property, severing approximately 15 acres from Estrella Mountain Regional Park and 46 acres from the King Ranch.

The 46-acre King property consists mainly of a steeply sloped foothill and a small narrow strip of land along the base of the foothill facing northwest and Estrella Parkway. This strip of land could potentially be developed while the remainder would be extremely difficult to develop. This foothill also contains some excellent petroglyphs and cultural resources which should be protected.

The 15 acres severed from Estrella Mountain Regional Park are fairly level and could be developed. They are critical in that this area becomes the entry, or front door, to American Continental's residential community of Estrella.

The Parks and Recreation Department, Mr. King and American Continental, should actively pursue some boundary adjustments to ensure that both the public and private interests are protected and accommodated.

The third set of parcels to be considered for a possible land trade is located in the northernmost part of Estrella Mountain Regional Park, within the Gila River floodway. A parcel within the current park boundary of approximately 59 acres is separated from the rest of the park by the Buckeye Irrigation District's canal. This entire parcel is within the floodway of the Agua Fria and Gila Rivers according to the 15 April 1988 National Flood Insurance Program Map.

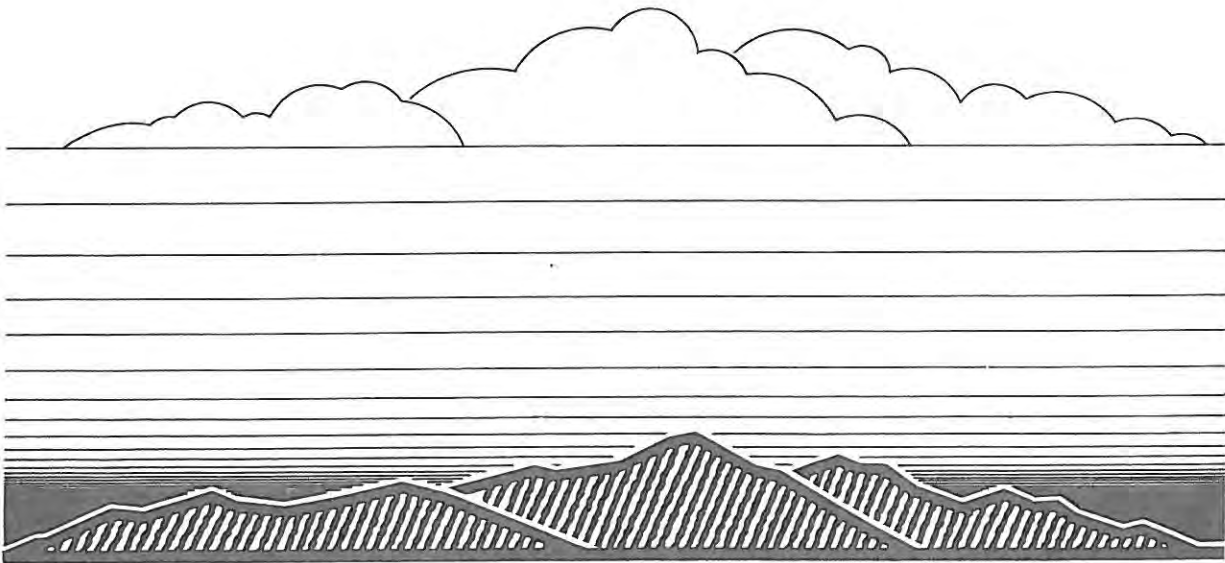
The Buckeye Irrigation District's channel creates an effective barrier to this parcel and would have to be bridged in some manner to make this parcel accessible. Without a bridge, a separate roadway or entrance from the north side of the river would be required. Regardless of access, this parcel has limited usefulness and could be considered for trade.

The Buckeye Irrigation District has a 40-acre parcel under the Bullard Avenue bridge and just west of the Estrella Mountain Regional Park property. This entire parcel is also in the Gila River Floodway but could be very useful to the Park. The Buckeye Irrigation District parcel is strategically located with respect to visibility from the Bullard Avenue bridge and gaining access to this parcel would allow for greater design flexibility of a water feature in the Gila River floodway. The initial image of the Park could be better controlled and enhanced by utilizing this parcel. The Parks and Recreation Department should consider working with the Buckeye Irrigation District to resolve this possible boundary adjustment.

The fourth boundary adjustment or management agreement to be considered is located in the southeast corner of the Park. Three miles of the southern park boundary is in common with the Bureau of Land Management (BLM) property. This BLM property provides an excellent potential to expand mountain trails and remote camping areas to the south. This property also provides potential to make physical connections to 19 other sections of BLM property further to the south and east which has attained wilderness designation. This designation ensures that those 19 sections of the Sierra Estrella Mountain range will remain in their pristine state, free of development for an indefinite period. The Parks and Recreation Department should work out a possible management agreement with the BLM to provide expanded programs.

# V

## Market and Financial Analysis



*Estrella Mountain Regional Park  
Long-Range Master Plan*



## A. SUMMARY OF FEATURE RECOMMENDATIONS

The analysis of the market including existing activities and facility usage, input from public hearings, surveyed user needs as well as desired improvements, and selected feasibility analysis has resulted in a series of recommendations for new features and expanded facilities at Estrella Mountain Regional Park. These recommendations are summarized below and presented in more detail in Sections B. - Q.

It is important to note at the outset that these recommendations for new park features and facilities are, with the exception of picnicking and to some extent swimming, the result of individualized market analysis and not derived solely from projections of total park visitation. The projections for total park visitation to the year 2005 can be found in Appendix D.

These recommendations can be summarized as follows:

1. Privately-operated Recreational Vehicle (R-V) Park - 60-80 acres required, with 250 units initially in Phase 1 (1990), and a Phase 2 of 200 units in 1993 as continuing growth in the market occurs.
2. Family Campground - 40 sites are recommended for development now, with growth potential to approximately 200 sites by the year 2005. The facility will have vehicular access, water & electrical hookups, with a grill, fire ring, and picnic table at each campsite. (An additional campground facility may be feasible in the long term at a location in the southern section of the park as well).
3. Group R-V Site - 15 acres with space for approximately 180 rigs. At this time 60 sites are recommended for development. Ultimately, the facility should incorporate at least three (3) large group ramadas, perhaps one at each end and one in the middle of the site. Of the 15 acres recommended, 5 acres would initially be part of the Overflow Facility described below.
4. Overflow R-V Site - 15 acres with a central water distribution point and unimproved roads. This facility would be available to serve very large groups and excess demand in the heaviest user months of February, March, and October. In addition, this facility would remain open year-round to serve patrons during the off-season when the family and group facilities are closed. It is recommended that this facility be developed as part of the Master Plan's Phase 1.

5. Swimming Pool (Lagoon-type) - On a 2-acre site, with in about 1991. The facility should incorporate:
  - a. fountains;
  - b. wave pool;
  - c. rafts or water toys;
  - d. bath house w/ rooftop lounging/snack concession for comfortable adult pool observation;
  - e. tot pool separated from main pool; and
  - f. off-season bumper boat concession.
  
6. Sports Complex - On 40-50 acres to include:
  - a. One (1) four-field lighted softball pod in the initial phase of park development (with two of the fields set up for league/tournament play, and the other two for recreational [2 hour maximum reservation] and multiple-use [soccer]), with potential for ultimate expansion to three (3) 4-field pods;
  - b. One (1) handball/racquetball facility w/ four (4) courts and potential expansion to eight (8);
  - c. Four (4) volleyball sand pits;
  - d. Two (2) basketball courts;
  - e. Batting cages (concession);
  - f. Full-service central concession stand; and,
  - g. Kids playground (directly adjacent).
  
7. Shooting Range - (Including a 100 & 200-yard rifle range, several pistol ranges [practical, silhouette, and 25-yard basic], and a trap & skeet combination facility). This facility should be developed as part of the first phase of the park development.
  
8. Other Facilities
  - a. Resort - There will probably not be a market for a resort at Estrella Mountain Regional Park prior to the year 2000.
  - b. Lake (Lagoon) - On a 40-50 acre site, with approximately 15 surface acres of water as part of the first development phase. The lake should incorporate an urban fishing program and paddle boats. The lake will make a major contribution in expanding the park's market during the "shoulder" months of the season, and also during the summer.
  - c. Bike Path/BMX Facility (possible concession).
  - d. Hiking Trails (short loop, somewhat flatter terrain).
  - e. Radio-controlled Model Airplane Flying Site.
  - f. Principal Park Road.
  - g. Trailride Concession.
  - h. Additional Picnic Tables - 40-45 acres. There are now 210 tables in the park. Plan for up to 410 tables by 2005, along with a group picnic area with approximately 50 tables for development in Phases 1-3.



- i. Convenience Store Facility Site - Reserve a one-and-a-half (1.5) acre site for such a potential facility. This should be scheduled for development in Phase 2, or sometime between 1993 and 1995, provided that the lake and privately operated recreational vehicle park have been developed.
- j. New Ranger/Contact Station.

## B. MARKET AREA DEFINITION

In defining the market area for the Estrella Mountain Regional Park, Sunregion Associates, Inc. has taken into account not only regional growth patterns, but also projected development, and the overlay of a dramatically improved freeway system in the valley.

### 1. Park User Survey Data

The most useful information in helping define the market area came from the County's Park User Survey Response Evaluations prepared by the Parks and Recreation Department for the periods from August 5, 1984 - September 3, 1984, and February 17, 1985 - May 27, 1985. In addition, Sunregion Associates, Inc. analyzed more recent raw data derived from registration forms compiled for group visitations during the period from July 4, 1986 - June 27, 1987, and Park User Survey forms completed by visitors and other survey respondents during the period April 11, 1987 - July 6, 1987, and in January, 1988. The results of this analysis are reflected in Tables 5 and 6.

Table 5  
 Estrella Mountain Regional Park  
 Group Visitation Data by Place of Origin,  
 7/4/86 thru 6/27/87

<u>Place of Origin</u>	<u>Number</u>	<u>% of Total</u>
Phoenix	4	1.5
West Phoenix	67	25.3
South Phoenix	9	3.4
N.E. Phoenix	3	1.1
North Phoenix	8	3.0
Central Phoenix	9	3.4
Phoenix Total	100	37.7
Avondale	31	11.7
Glendale	24	9.1
Sun City	19	7.2
Tolleson	18	6.8
Goodyear	16	6.0
Buckeye	15	5.7
Cashion	9	3.4
Litchfield Park	9	3.4
Peoria	8	3.0
Luke AFB	7	2.6
Mesa/Scottsdale	5	1.8
El Mirage/Surprise	2	.8
Out-of-State	1	.4
Tempe	1	.4
Total	265	100.0

Source: Sunregion Associates, Inc.

Table 6  
 Estrella Mountain Regional Park  
 Place of Residence User Survey Data,  
 4/11/87 thru 7/6/87, and 1/88

<u>Place of Origin</u>	<u>Number</u>	<u>% of Total</u>
Phoenix	76	21.7
West Phoenix	42	12.0
South Phoenix	3	.9
N.E. Phoenix	3	.9
North Phoenix	2	.6
Central Phoenix	2	.6
Phoenix Total	128	36.6
Avondale	49	14.0
Glendale	32	9.1
Tolleson	29	8.3
Cashion	28	8.0
Goodyear	17	4.9
Luke AFB	13	3.7
Sun City	12	3.4
Buckeye	10	2.9
Out-of-State	8	2.3
Peoria	6	1.7
White Tanks	4	1.1
Tempe	3	.9
Scottsdale	3	.9
Chandler	2	.6
Mesa	1	.3
Litchfield Park	2	.3
El Mirage	1	.3
Laveen	1	.3
Surprise	1	.3
Total	350	100.0

Source: Sunregion Associates, Inc.

Taking this data into consideration, as well as other factors such as planned freeway development and projected population growth patterns, Sunregion Associates, Inc. has identified Primary and Secondary Market Areas for Estrella Mountain Regional Park. The pattern observed in a total of 649 User Survey responses, plus an additional 265 group reservation applications, clearly indicates that west Phoenix, Avondale, Glendale, Goodyear, Tolleson, Buckeye, and other adjacent areas dominate as the source of the park's patrons.

Note should be taken of the group registration data which indicates that more than 85 percent of the user groups come to the park from the Primary Market Area. Unlike the user survey forms, the group registration data enables an analyst to more precisely identify the origin of group visitors. In contrast, the user survey forms frequently do not identify anything more than the patron's resident community.

However, in the case of the Phoenix park visitor origins identified in Table 6, by allocating the non-specific area responses (City of Phoenix) according to the distribution of the other more specific location responses (west, south, central, northeast, and north Phoenix), and by evaluating those responses in light of the group visitation data, it seems reasonable to conclude that the bulk of the Phoenix patronage at Estrella Mountain Regional Park is from west Phoenix.

## 2. Primary Market Area

The resulting Primary Market Area is shown on Figure 23. It is bounded on the north by Bell Road between 19th Avenue and approximately 203rd Avenue (the Tuthill Road alignment). The Primary Market Area is bounded on the west by the Tuthill Road alignment between Bell Road and McDowell Road, by I-10 from the Tuthill Road alignment to Oglesby Road (267th Avenue), and by Oglesby Road between I-10 and Pecos Road (17200 south) on the south. The southern boundary extends along Pecos Road between Oglesby Road and the 115th Avenue alignment, then north along the 115th Avenue alignment to the Salt River, east along the Salt River to 83rd Avenue, north along 43rd Avenue to Broadway Road, and east along Broadway Road to 19th Avenue. The eastern boundary is 19th Avenue.

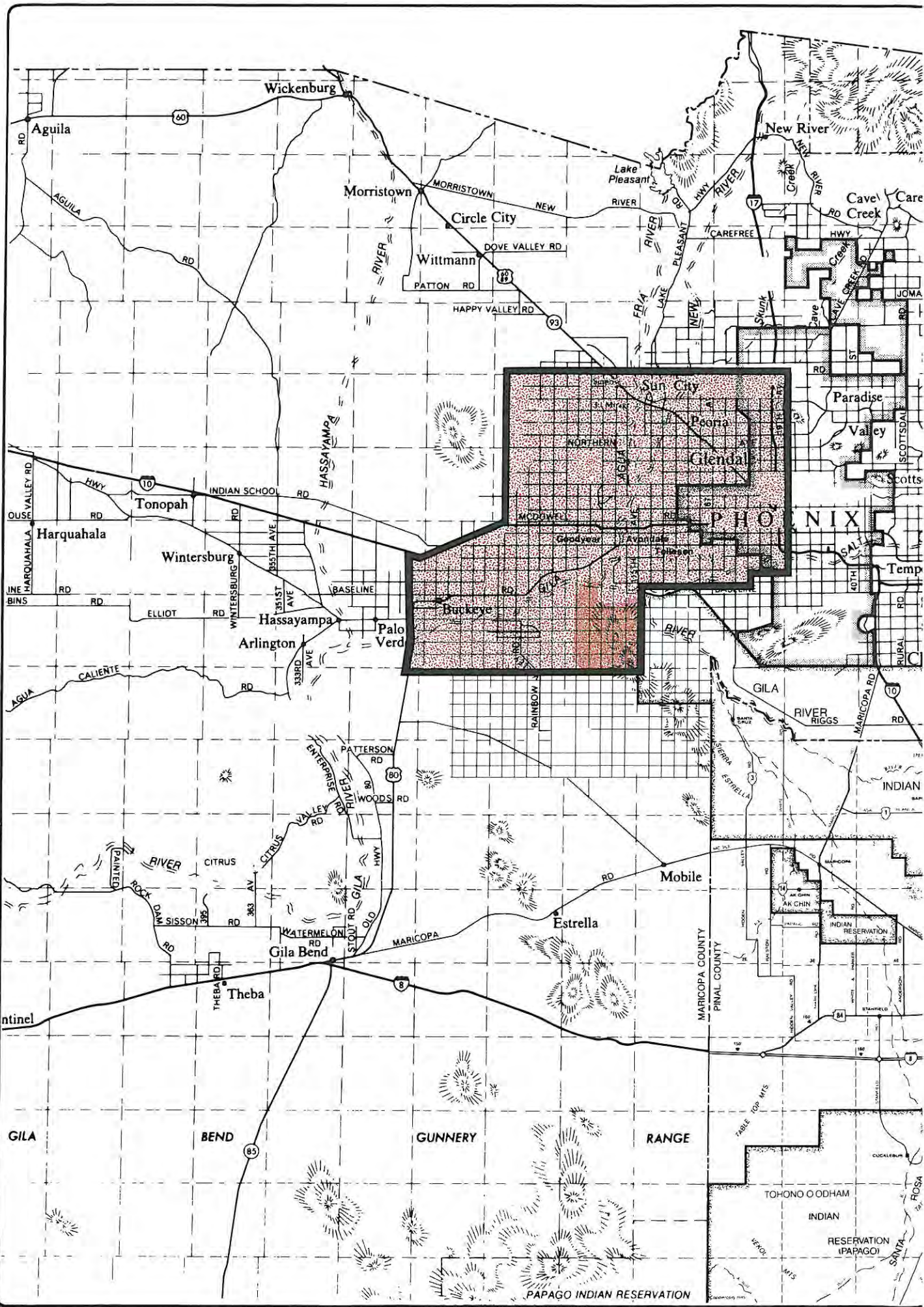
That portion of the Primary Market Area bounded by Baseline Road on the north, Pecos Road on the south, 187th Avenue on the west, and 159th Avenue on the east, encompasses American Continental Corporation's (AMCOR) Estrella Planned Community. In addition, the Primary Market Area also contains the Estrella Comprehensive Planning Area. This multi-jurisdictional area is bounded by I-10 on the north, the Salt River on the south, the Agua Fria River on the west, and 19th Avenue on the east. While both areas are largely undeveloped, as these areas grow over the next 20 years, many of their residents will undoubtedly visit and use the facilities at Estrella Mountain Regional Park and Sierra Estrella Golf Course.

## 3. Secondary Market Area

The Secondary Market Area has been defined as the balance of the Phoenix Metropolitan Area not included in the Primary Market Area.

Sunregion Associates, Inc. estimates that approximately 85 percent of the visitation to Estrella Mountain Regional Park comes from the Primary Market Area. The balance, or 15 percent, comes primarily from the Secondary Market Area communities of Phoenix, Scottsdale, Tempe, Chandler, and Mesa.

A small amount of additional demand has been experienced and may be expected from out-of-state visitors, but because the issue of their state of origin lacks relevance to this master planning process, no analysis of this factor has been undertaken. However, the population projections provided elsewhere in this report do include non-resident/seasonal visitors.





#### 4. Sierra Estrella Golf Course Primary Market Area

Although additional survey research should prove useful, based on the consultant's analysis developed from a survey conducted by Dick Mulvaine, Inc. on a weekend in April, 1987, about 50 percent of the visitors to the golf course were from the Estrella Mountain Regional Park's Primary Market Area. In other words, the survey shows that the Primary Market Area for the golf course covers a larger area than for Estrella Mountain Regional Park. As might be expected, then, a larger number of people who play golf at Sierra Estrella travel greater distances than do those who use other facilities within the park. Seventy-one percent of the visitors to the golf course travel up to 25 miles, and the remaining 29 percent travel more than 25 miles.

Based on this survey data, it is estimated that the Primary Market Area for Sierra Estrella Golf Course is approximately bounded by Pinnacle Peak Road on the north, Patterson Road alignment on the south, 339th Avenue on the west, and 48th Street on the east (see Appendix C for detailed description). These boundaries extend to the most distant points within 25 highway miles of the golf course.

#### C. ESTRELLA MOUNTAIN REGIONAL PARK MARKET AREA POPULATION AND HOUSEHOLD PROJECTIONS

Table 7, and Tables 9 through 13 provide data on population and households from 1980 to 1985, and projections to 2005 for Estrella Mountain Regional Park's Primary and Secondary Market Areas, and for the Phoenix Metropolitan Area. Table 8 provides an indication of the size and projected growth of the population in Sierra Estrella Golf Course's Primary Market Area. The data shown in these tables is as of April, 1980, October, 1985, and mid-year 1990, 1995, 2000, and 2005.

Table 7 and 9 indicate that Estrella Mountain Regional Park's Primary Market Area population will increase from 1985-2005, but not as rapidly as in the Secondary Market Area.

**Table 7**  
**Estrella Mountain Regional Park Primary and Secondary Market**  
**Areas, Resident and Non-Resident Population Growth**  
**1980 to 2005**

<u>Area</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>
Primary Market	523,304	579,918	675,753	800,251	928,433	1,036,325
% of Phx. Metro.	33.5	30.3	28.5	27.4	27.2	27.1
% Increase <sup>1</sup>	-	10.8	16.5	18.4	16.0	11.6
Secondary Market	1,040,376	1,337,469	1,692,911	2,124,871	2,489,746	2,785,923
% of Phx. Metro.	66.5	69.7	71.5	72.6	72.8	72.9
% Increase	-	28.6	26.6	25.5	17.2	11.9
Phx. Metro.	1,563,680	1,917,387	2,368,664	2,925,122	3,409,179	3,822,248
% Increase	-	22.6	23.5	23.5	16.6	12.1

Source: Maricopa Association of Governments (MAG) Transportation and Planning Office, TAZ data, May, 1987; and, Sunregion Associates, Inc. <sup>1</sup>1980-85, 1985-90, 1995-2000, and 2000-2005.

As reported in Table 8, the Sierra Estrella Golf Course Primary Market Area population will outpace the growth rate of the Secondary Market Area from 1995-2005. The Primary Market Area projections in Table 8 are high growth projections stemming from the inclusion of projections for the Estrella Planned Community which are substantially above those projected by MAG at a time when little was known about the proposed development.



**Table 8**  
**Sierra Estrella Golf Course Primary and Secondary Market**  
**Areas, Resident and Non-Resident Population Growth**  
**1985 to 2005**

<u>Area</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>
Primary Market	642,917	762,904	950,493	1,130,619	1,279,772
% of Phx. Metro.	35.0	33.7	34.1	34.5	35.1
% Increase	-	18.7	24.6	19.0	13.2
Secondary Market	1,195,037	1,499,118	1,840,819	2,121,644	2,365,087
% of Phx. Metro.	65.0	66.3	65.9	65.5	64.9
% Increase	-	25.2	22.8	15.3	11.5
Phx. Metro.	1,837,954	2,262,022	2,791,312	3,252,263	3,644,809

Source: Same as previous table.

**Table 9**  
**Estrella Mountain Regional Park Primary and Secondary**  
**Market Areas, Resident Population Growth 1980-2005**

<u>Area</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>
Primary Market	518,406	571,999	665,158	786,406	910,759	1,014,975
% of Phx. Metro.	34.4	31.1	29.4	28.2	28.0	27.9
% Increase <sup>1</sup>	-	10.3	16.3	18.2	15.8	11.4
Secondary Market	990,854	1,265,955	1,596,864	2,004,906	2,341,504	2,629,834
% of Phx. Metro.	65.6	68.9	71.5	72.6	72.8	72.7
% Increase	-	27.8	26.1	25.6	16.8	12.3
Phoenix Metro.	1,509,260	1,837,954	2,262,022	2,791,312	3,252,263	3,644,809
% Increase	-	21.8	23.1	23.4	16.5	12.1

Source: MAG, TAZ data, May, 1987; and, Sunregion Associates, Inc. 1980-85, 1990-95, 1995-2000, 2000-2005.

## 1. Households and Household Size

Tables 10 and 11 show that household growth patterns in the Primary Market Area will follow those of population growth. That is, like population growth the number of households in the Primary Market Area is projected to increase from 1985 to 2005, but not as fast as in the Secondary Market Area.

**Table 10**  
**Estrella Mountain Regional Park Primary and Secondary Market**  
**Areas, Resident and Non-Resident Household Growth 1980 to 2005**

<u>Area</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>
Primary Market	216,714	260,002	311,860	364,324	407,952
% of Phx. Metro.	28.3	27.0	26.1	26.0	25.9
Secondary Market	549,304	702,945	885,046	1,036,418	1,165,340
% of Phx. Metro.	71.7	73.0	73.9	74.0	74.1
Phx. Metro.	765,478	962,947	1,196,906	1,400,742	1,573,292

Source: MAG Transportation and Planning Office, TAZ data, May, 1987; and, Sunregion Associates, Inc.

**Table 11**  
**Estrella Mountain Regional Park Primary and Secondary Market**  
**Areas, Resident Household Growth 1985 to 2005**

<u>Area</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>
Primary Market	209,111	246,869	299,473	348,694	389,338
% of Phx. Metro.	29.8	28.1	27.5	27.3	27.2
Secondary Market	493,133	631,434	791,343	927,774	1,043,607
% of Phx. Metro.	70.2	71.9	72.5	72.7	72.8
Phx. Metro.	702,244	878,303	1,090,816	1,276,468	1,432,945

Source: Maricopa Association of Governments (MAG) Transportation and Planning Office, TAZ data, May, 1987; and, Sunregion Associates, Inc.

As shown in Table 12, households in the Primary Market Area are larger than in the Secondary Market Area, and are projected to remain larger from 1990-2005.

**Table 12**  
**Estrella Mountain Regional Park Primary and Secondary Market**  
**Areas, Average Resident Household Size 1985-2005**

<u>Area</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>
Primary Market Area	2.69	2.65	2.58	2.53	2.51
Secondary Market Phoenix Metro.	2.53	2.49	2.49	2.50	2.50
	2.58	2.54	2.52	2.51	2.50

Source: Same as previous table.

## 2. High-Growth Population and Household Projections

Table 13 identifies high-growth population and household projections for the Estrella Mountain Regional Park's Primary Market Area. If these projections are achieved, the Primary Market Area's share of 1990-2005 population and household growth will increase above the shares previously identified in Tables 7 and 10 while the Secondary Market Area's share of population and household growth will decline. This conclusion is based on the assumption that population and household projections for the Phoenix Metropolitan Area (consisting of the Primary and Secondary Market Areas) will not exceed current MAG projections to the year 2005.

As noted previously, the Primary Market Area contains both the Estrella Planned Community and the Estrella Comprehensive Planning Area. The Estrella Planned Community lies within the City of Goodyear and the high-growth projections significantly exceed the MAG projections for this area. The first phase of AMCOR's development encompasses about 5 square miles and contains just over 7,000 housing units. At build-out, Estrella Planned Community projections indicate that the community will have over 76,000 housing units and 180,000 to 200,000 residents.

The high growth projections in Table 13 also assume that the population and household projections for the Estrella Comprehensive Planning Area are achieved. The population and household projections for this area are also significantly above MAG projections to the year 2005. As noted in a previous section, the Estrella Comprehensive Planning Area is a multi-jurisdictional area bounded by I-10 on the north, the Salt River on the south, the Agua Fria River on the west, and 19th Avenue on the east. The planning area contains 70 square miles and includes portions of the Phoenix, Tolleson, Avondale, and unincorporated areas of Maricopa County.

The high-growth population and household projections for all other portions of the Primary Market Area are MAG projections.

**Table 13**  
**Estrella Mountain Regional Park Primary Market Area,**  
**Resident and Non-Resident Population and Household High**  
**Growth Projections 1985 to 2005**

<u>Population/ Households</u>	<u>Primary Market Area</u>	<u>Secondary Market Area</u>	<u>Phoenix Metro. Area</u>
1985			
Population	579,918	1,337,469	1,917,387
% of Phx. Metro.	30.3	67.7	100.0
% Pop. Inc. 80-85	10.8	28.6	22.6
Households	216,714	549,304	765,478
% of Phx. Metro.	28.3	71.7	100.0
1990			
Population	677,202	1,692,462	2,368,664
% of Phx. Metro.	28.6	71.4	100.0
% Pop. Inc. 85-90	16.8	26.5	23.5
Households	260,519	702,428	962,947
% of Phx. Metro.	27.1	72.9	100.0
1995			
Population	832,767	2,092,344	2,925,122
% of Phx. Metro.	28.5	71.5	100.0
% Pop. Inc. 90-95	23.0	23.6	23.6
Households	326,595	870,311	1,196,906
% of Phx. Metro.	27.3	72.7	100.0
2000			
Population	1,013,545	2,395,634	3,409,179
% of Phx. Metro.	29.7	70.3	100.0
% Pop. Inc. 95-2000	21.7	14.5	16.6
Households	400,652	1,000,090	1,400,742
% of Phx. Metro.	28.6	71.4	100.0
2005			
Population	1,139,607	2,682,641	3,822,248
% of Phx. Metro.	29.8	70.2	100.0
% Pop. Inc. 2000-05	12.4	12.0	12.1
Households	451,837	1,121,455	1,573,292
% of Phx. Metro.	28.7	71.3	100.0

Source: AMCOR, Update to Preliminary PAD, City of Goodyear, September, 1987; City of Goodyear, Population Projections, December, 1987; Maricopa Association of Governments, Transportation and Planning Office, May, 1987; and, Sunregion Associates, Inc.

### 3. Age Distribution

As previously noted in Table 12, average household size is larger in the Primary Market Area than in the Secondary Market Area. As would be expected then, and as reported in Table 14, the Primary Market Area population reflects a younger age distribution than in the Secondary Market Area.

**Table 14**  
**Estrella Mountain Regional Park, Age Distribution**  
**in the Primary and Secondary Market Area and the Phoenix**  
**Metropolitan Area Population, 1985**  
**(In Percentages and Median Years)**

<u>Age Group</u>	<u>Primary</u> <u>Market Area</u>	<u>Secondary</u> <u>Market Area</u>	<u>Phoenix</u> <u>Metro. Area</u>
13 & under	21.7	19.6	20.2
14-20	11.1	8.2	9.1
21-34	25.3	26.4	26.0
35-49	18.2	18.5	18.4
50-64	11.8	13.2	12.8
65 & over	11.9	14.1	13.5
Total	100.0	100.0	100.0
Median Age in Years	30.5	32.8	31.1

Source: U.S. Department of Commerce, 1985 Special Census of Maricopa County; and, Sunregion Associates, Inc.

### 4. Income Distribution

As reported in Table 15, the average income of the Primary Market Area population is somewhat lower than in the Secondary Market Area. This stems in part from the larger household size and younger population distribution in the Primary Market Area.

Table 15  
Household Income Distribution in the Primary and Secondary  
Market Area and the Phoenix Metropolitan Area Population,  
1980, and Estimated Household Income in 1986  
(In Percentages and Dollars)

<u>Income Group</u>	<u>Primary Market Area</u>	<u>Secondary Market Area</u>	<u>Phoenix Metro. Area</u>
Less than 5,000	10.1	10.6	10.5
5,000 to 7,499	6.5	7.1	6.9
7,500 to 9,999	7.8	8.0	7.9
10,000 to 14,999	17.0	15.8	16.2
15,000 to 19,999	15.9	14.3	14.8
20,000 to 24,999	14.9	6.7	13.1
25,000 and over	27.8	37.5	30.6
Totals	100.0	100.0	100.0
Ave. Income 1979	\$20,091	\$21,686	\$21,193
Median Income 1979	17,704	17,976	17,728
Median Income 1986	NA	NA	31,000
Per Capita 1979	6,875	8,042	7,716
Per Capita 1986	NA	NA	14,490

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Source: 1980 U.S. Census of Population and Housing; 1987  
Inside Phoenix; Forecast 1987; and, Sunregion Associates, Inc.

D. VISITATION TO ESTRELLA MOUNTAIN REGIONAL PARK AND SIERRA ESTRELLA GOLF COURSE

Tables 16 provides visitation information for Estrella Mountain Regional Park and Sierra Estrella Golf course for calendar years 1982 through 1987. Tables 17 and 18 provide more detailed comparative monthly visitation information for Estrella Mountain Regional Park/Sierra Estrella Golf Course, other selected Maricopa County parks, and all Maricopa County Regional Parks.

Table 16 indicates that visitation to Estrella Mountain Regional Park and Sierra Estrella Golf Course declined from 1982 through 1983, and declined further from 1983 through 1984. Attendance increased at both facilities from 1984 through 1985. Since 1985, however, golf course visitation has remained constant while park visitation has continued to increase. Over the entire 1982-1987 period, golf course attendance at Estrella Mountain Regional Park increased by just over 3 percent.

Table 16  
Estrella Mountain Regional Park Visitation  
Calendar Years 1982 through 1987

<u>Calendar Year</u>	<u>Estrella Mountain Regional Park</u>	<u>Sierra Estrella Golf Course</u>	<u>Total</u>	<u>All Cty Parks</u> <sup>2</sup>
1982	204,281	48,168	252,449	2,463,945
1983	199,707	46,293	246,000	2,461,939
% Chg. 82-83	-2.24	-3.89	-2.55	-.08
1984	181,977	44,323	226,300	2,312,433
% Chg. 83-84	-8.88	-4.26	-8.01	-6.07
1985	216,886	50,402	267,288	2,511,110
% Chg. 84-85	19.18	13.72	18.11	8.59
1986	358,450	50,006	408,456	2,653,670 <sup>3</sup>
% Chg. 85-86	65.27	-.79	52.81	5.68
1987	409,316	49,617	458,933	2,627,841
% Chg. 86-87	14.19	-.78	12.67	-.97
% Chg. 82-87	100.37	3.01	81.79	6.65
Av. Ann. 82-87 <sup>1</sup>	14.91	.59	12.70	1.30

Source: Maricopa County Parks and Recreation Department; and, Sunregion Associates, Inc. <sup>1</sup>Compound Annual Average. <sup>2</sup>Excludes Reach 11, Spook Hill, Urban Recreation, and Interpretative Program; and, includes golf course, shooting and archery range attendance. <sup>3</sup>1986 total visitation adjusted to 2,836,249 from 3,018,828.

Table 17 compares the monthly attendance distribution at Estrella Mountain Regional Park and the Sierra Estrella Golf Course with attendance at the Paradise Valley Golf Course and Park, Lake Pleasant, Adobe/Cave Creek Parks, and all Maricopa County Regional Parks.

Review of Table 17 shows that on a calendar year basis, February, March, and April, as well as October and November, are the months which draw the greatest number of visitors to Estrella Mountain Regional Park. February and March are the months which account for the largest number of patrons at the Sierra Estrella Golf Course.

It is important to note that during the months of June, July, and August, when visitation to Estrella Mountain Regional Park is at its lowest levels, parks which have a water feature (such as Adobe Mountain), or are water oriented (Lake Pleasant) draw very well. This suggests that a water feature at Estrella Mountain Regional Park (lake, pond, lagoon, pool etc.) could help increase attendance during the slow months.

**Table 17**  
**Percentage Distribution of Monthly and Annual Visitation**  
**to Estrella Mountain Regional Park, Sierra Estrella Golf Course,**  
**Other Selected Maricopa County Regional Parks, and All Maricopa**  
**County Regional Parks in Calendar Years 1985 and 1986**

<u>Month/ Year</u>	<u>Estrella Mountain Reg. Prk.</u>	<u>Sierra Estrella Golf</u>	<u>Paradise Valley Golf</u>	<u>Lake Pleasant Reg. Prk.</u>	<u>Adobe/ Cave Cr. Reg. Prk.</u>	<u>All Cty Reg. Parks</u>
January						
1985	3.1	10.9	9.0	2.9	1.4	4.2
1986	4.1	8.8	6.3	3.4	.3	5.7
February						
1985	7.3	12.4	9.6	5.4	1.9	7.0
1986	9.6	13.9	7.2	4.8	.2	7.0
March						
1985	10.6	14.6	9.9	11.2	3.5	11.8
1986	13.8	14.3	7.8	13.9	5.3	13.5
April						
1985	13.3	10.8	9.6	13.1	1.7	10.5
1986	9.4	10.8	9.7	12.0	2.1	9.1
May						
1985	9.1	7.5	8.2	13.2	.9	8.5
1986	7.8	7.8	7.6	13.1	3.4	8.6
June						
1985	8.4	5.8	7.0	15.3	2.0	12.5
1986	6.9	5.7	6.6	15.6	25.7	13.1



Table 17 (Continued)  
 Percentage Distribution of Monthly and Annual Visitation  
 to Estrella Mountain Regional Park, Sierra Estrella Golf Course,  
 Other Selected Maricopa County Regional Parks, and All Maricopa  
 County Regional Parks in Calendar Years 1985 and 1986

<u>Month/ Year</u>	<u>Estrella Mountain Reg. Prk.</u>	<u>Sierra Estrella Golf</u>	<u>Paradise Valley Golf</u>	<u>Lake Pleasant Reg. Prk.</u>	<u>Adobe/ Cave Cr. Reg. Prk.</u>	<u>All Cty Reg. Parks</u>
July						
1985	4.4	4.6	6.9	10.2	1.1	10.0
1986	4.6	5.2	8.2	10.0	23.3	10.6
August						
1985	4.8	5.4	7.6	8.9	62.7	8.2
1986	5.6	5.2	7.3	9.5	27.2	8.1
September						
1985	9.1	4.2	7.1	8.6	18.5	7.7
1986	7.1	5.2	7.4	6.5	5.3	5.6
October						
1985	13.5	7.0	7.8	4.5	4.7	7.2
1986	10.9	5.5	7.0	5.1	3.2	6.8
November						
1985	10.4	8.4	8.9	3.5	1.1	6.4
1986	12.1	8.9	14.6	3.5	.6	7.3
December						
1985	6.0	8.4	8.4	3.2	.5	6.0
1986	6.0	8.7	12.1	1.7	3.4	4.6
Total Visitation						
1985	216,886	50,405	63,864	1,058,203	90,261	2,721,036
1986	358,450	48,315	84,445	997,444	167,192	2,824,873
% Change	65.3	-4.1	32.2	-5.7	85.2	3.9

Source: Sunregion Associates, Inc., prepared from monthly visitation reports provided by the Maricopa County Parks and Recreation Department.

Table 18 again provides monthly visitation to Estrella Mountain Regional Park and the Sierra Estrella Golf Course but the data is presented for fiscal years rather than calendar years. For example, fiscal year 1985-86 begins on July 1, 1985, and ends on June 30, 1986.

Table 18  
 Percentage Distribution of Monthly and Annual Visitation to  
 Estrella Mountain Regional Park, Sierra Estrella Golf  
 Course, Other Selected Maricopa County Regional Parks, and  
 All Maricopa County Regional Parks in Fiscal Years  
 1985-86 and 1986-87

<u>Month/ Year</u>	<u>Estrella Mountain Reg. Prk.</u>	<u>Sierra Estrella Golf</u>	<u>Paradise Valley Golf</u>	<u>Lake Pleasant Reg. Prk.</u>	<u>Adobe/ Cave Cr. Reg. Prk.</u>	<u>All Cty Reg. Parks</u>
July						
1985	3.5	4.7	6.7	10.3	.7	9.5
1986	3.8	5.1	5.5	10.5	23.1	10.5
August						
1985	3.8	5.6	7.3	9.0	39.9	7.8
1986	5.9	5.1	4.9	10.0	27.0	8.0
September						
1985	7.2	4.3	6.9	8.7	11.7	7.4
1986	4.7	5.1	5.0	6.9	5.3	5.6
October						
1985	10.7	7.2	7.4	4.5	3.0	6.9
1986	9.1	5.3	4.7	5.4	3.2	6.7
November						
1985	8.2	8.7	8.1	3.2	.3	5.7
1986	10.1	8.7	8.1	1.8	3.4	4.6
December						
1985	4.8	8.7	8.0	3.2	.3	5.7
1986	5.0	8.5	8.1	1.8	3.4	4.6
January						
1985	4.8	8.7	8.0	3.2	.3	5.7
1986	8.1	10.5	10.0	3.3	1.9	6.7
February						
1985	11.0	13.8	9.1	4.6	.3	7.0
1986	14.3	12.6	10.7	4.6	1.1	9.0
March						
1985	15.8	14.2	9.9	13.2	6.3	13.4
1986	11.1	13.4	12.1	7.7	1.0	8.1

Table 18 (Continued)  
 Percentage Distribution of Monthly and Annual Visitation to  
 Estrella Mountain Regional Park, Sierra Estrella Golf  
 Course, Other Selected Maricopa County Regional Parks, and  
 All Maricopa County Regional Parks in Fiscal Years  
 1985-86 and 1986-87

<u>Month/ Year</u>	<u>Estrella Mountain Reg. Prk.</u>	<u>Sierra Estrella Golf</u>	<u>Paradise Valley Golf</u>	<u>Lake Pleasant Reg. Prk.</u>	<u>Adobe/ Cave Cr. Reg. Prk.</u>	<u>All Cty Reg. Parks</u>
April						
1985	10.8	10.7	10.0	12.3	2.5	9.0
1986	12.8	10.6	11.0	13.5	6.1	11.2
May						
1985	11.4	7.7	9.7	12.5	4.0	8.6
1986	9.9	9.0	10.3	16.8	11.1	10.8
June						
1985	8.0	5.6	8.3	14.9	30.3	12.9
1986	5.2	6.1	7.8	15.8	16.2	11.6
Total Visitation						
1985-86	273,682	48,714	66,556	1,047,990	141,972	2,852,947
1986-87	376,691	49,382	126,034	942,495	189,242	2,853,928
% Change	37.6	1.4	89.4	-10.1	33.3	nc

Source: Sunregion Associates, Inc., prepared from monthly visitation reports provided by the Maricopa County Parks and Recreation Department.

**E. VISITATION TRENDS TO SELECTED ARIZONA NATIONAL, STATE AND LOCAL PARKS**

This section provides a long-term overview of visitation trends to selected national, state, and local parks in Arizona. Visitation trends for selected national and state parks are reported in Table 19 and 20. These parks have been grouped into two classifications, scenic parks (Table 19) and water-based (Table 20). Table 21 provides historic visitation data for the City of Phoenix's Encanto Park, South Mountain Park, and the Phoenix Tennis Center, in addition to usage of the local golf courses.

Review of the park visitation data in Tables 19 and 20 points to an upward visitation trend in both scenic and water-based recreation at parks in Arizona. National Parks such as Grand Canyon and Lake Mead Recreational Area have experienced the fastest attendance growth since 1979. Grand Canyon National Park attendance has increased at an annual compound rate of 5.6 percent and Lake Mead has experienced a 5.8 percent annual increase.

**Table 19**  
**Long-Term Visitation Trends to Selected Scenic National**  
**and State Parks in Arizona (In Thousands)**

<u>Year</u>	<u>Grand Canyon</u>	<u>Petrified Forest</u>	<u>Sunset Crater Nat.Mon.</u>	<u>Arizona<sup>1</sup> Sonora Desert</u>	<u>Organ<sup>1</sup> Pipe Cactus</u>	<u>Boyce<sup>2</sup> Thompson</u>	<u>Total Scenic Parks</u>
1979	2,337	671	309	450	131	69	3,967
1980	2,602	683	312	408	148	80	4,233
1981	2,674	739	354	418	177	84	4,446
1982	2,500	711	349	433	151	80	4,224
1983	2,449	709	375	466	205	70	4,274
1984	2,361	715	409	454	182	54	4,175
1985	2,987	737	413	473	176	66	4,852
1986	3,348	761	426	551	220	68	5,374

Percentage Change in Visitation

1979-							
1986	43.3	13.4	37.9	22.4	67.9	-1.4	35.5
1980-							
1986	28.7	11.4	36.5	35.1	48.7	-15.0	27.0
1982-							
1986	33.9	7.0	22.1	27.3	45.7	-15.0	27.2
79-86							
Ave.An.	5.6	1.8	4.7	2.9	7.7	-0.2	4.4

Source: Arizona Business Review, 1987, National Park Service, and Arizona State Parks Board. <sup>1</sup>National Monument.

<sup>2</sup>Desert Museum in Tucson. <sup>3</sup>Compound Annual Average.

Table 20  
 Long-Term Visitation Trends to Selected Water-Based Recreation  
 National and State Parks in Arizona  
 (In Thousands)

<u>Years</u>	<u>Lake Mead Nat. Recr. Area</u>	<u>Glen Canyon Nat. Recr. Area</u>	<u>Lake Havasu St. Prk.</u>	<u>Patagonia Lake State Park</u>	<u>Total Water Rec.Area</u>
1979	6,368	1,728	1,060	167	9,323
1980	5,151	1,644	796	155	7,746
1981	5,219	1,794	1,112	150	8,275
1982	5,378	1,848	858	140	8,224
1983	5,914	1,873	862	153	8,802
1984	6,277	1,971	879	141	9,268
1985	7,024	2,023	935	148	10,130
1986	7,753	2,409	1,084	166	11,412
Percentage Change in Visitation					
1979-					
1986	21.8	39.4	2.3	-.6	37.9
1980-					
1986	50.5	46.5	36.2	7.1	47.3
1982-					
1986	44.2	30.4	26.3	18.6	38.8
79-86					
Ave.An.	5.8	4.9	.3	-.1	4.7 <sup>1</sup>

Source: Arizona Business Review, 1987, National Park Service, and Arizona State Parks Board. <sup>1</sup>Compound Annual Average.

It was observed previously that water-based features should help increase visitation to Estrella Mountain Regional Park.

As shown in Table 21, attendance at major City of Phoenix recreation areas has varied considerably in recent years. Encanto Park has historically drawn more visitors than all other City Parks as a result of its activity mix and central location to major concentrations of employees and population base. Attendance at Encanto Park fell dramatically during 1987 as a result of the closure of the northern portion of the park. South Mountain Park has experienced the most rapid increase in visitation of the City Parks from 1982 through 1987. However, the rate of growth slowed considerably from 1986-1987.

**Table 21**  
**City of Phoenix Visitation Trends 1982 through 1987**  
**For Golf, South Mountain Park, Encanto Park, and the Phoenix**  
**Tennis Center**

<u>Year</u>	<u>Golf<sup>1</sup> Courses</u>	<u>South Mt. Park</u>	<u>Encanto Park</u>	<u>Phoenix Tennis Ctr.</u>
1982	384,163	1,272,505	4,037,141	na
1986	500,629	1,995,845	4,187,777 <sup>2</sup>	91,655
1987	487,691	2,081,680	1,198,060 <sup>2</sup>	87,855
% Change				
1982-87	27.0	63.6	3.7 <sup>3</sup>	na
86-87	-2.6	4.3	-	-4.5
1982-87 <sup>4</sup>				
Ave. Ann.	4.9	10.3	.9 <sup>3</sup>	na

Source: City of Phoenix Parks, Recreation and Library Department, January, 1988. <sup>1</sup>All City Courses. <sup>2</sup>North portion of park closed in December, 1986. <sup>3</sup>Percent change from 1982 through 1986. <sup>4</sup>Compound annual growth rate.

**F. CHARACTERISTICS OF VISITORS TO ESTRELLA MOUNTAIN REGIONAL PARK**

Data related to characteristics of visitors to Estrella Mountain Regional Park and other selected regional parks comes from user surveys conducted by the Maricopa County Parks and Recreation Department at various periods in 1984, 1985, and 1987. In the case of Estrella Mountain Regional Park, survey data is from Park User Surveys conducted during August 5, 1984 - September 3, 1984; February 17, 1985 - May 27, 1985; and, April 11, 1987 - July 6, 1987. Survey information for the Sierra Estrella Golf Course is from a survey of 200 patrons conducted in April, 1987.

Survey results reflected in the tables for other selected regional parks are based on surveys taken at the parks during the time periods noted below.

Lake Pleasant:	July 29, 1984 - September 3, 1984 March 13, 1985 - June 30, 1985
McDowell Mountain:	March 1, 1985 - April 28, 1985
Paradise Valley:	July 28, 1984 - September 3, 1984 March 8, 1985 - April 7, 1985
Usery Mountain:	February 7, 1985 - April 23, 1985

It should be noted that the Estrella Mountain Regional Park/Other Selected Regional Parks data compiled from the survey forms by Sunregion Associates, Inc. is not strictly comparable due to differences in data collection methods (time of day and method) and survey response rates. Nevertheless, comparative data is presented since at a minimum it provides a general profile of the patrons at various parks.

### 1. Age Group

Table 22 compares the age distributions of visitors to Estrella Mountain Regional Park and other selected regional parks (Lake Pleasant, Paradise Valley, McDowell Mountain, and Usery). As shown in the table, visitors to Estrella Mountain Regional Park are considerably younger than those to other selected regional parks. The age differential is considerable, and is magnified during the summer months when many school age children visit the park.

**Table 22**  
**Visitation by Age Group to Estrella Mountain Regional Park**  
**and Other Selected Maricopa County Regional Parks**  
**(In Percentages and Median Years)**

<u>Age Group</u>	<u>Estrella Mountain Regional Park</u>		<u>Other Selected Regional Parks</u>	
	<u>All Surveys</u>	<u>8/5-9/3<sup>1</sup></u>	<u>All Surveys</u>	<u>7/28-9/3<sup>2</sup></u>
13 and under	36.1	41.1	22.1	27.2
14-20	12.6	15.3	10.6	13.6
21-34	26.4	28.3	26.2	31.9
35-49	13.6	10.5	19.7	20.7
50-64	7.3	4.2	12.5	4.7
65 & over	3.9	.6	8.9	1.9
Total	100.0	100.0	100.0	100.0
Persons in Surveys	2,398	665	3,993	1,453
Median Age	21.7	18.1	30.2	25.0

Source: Compiled from Maricopa County Parks and Recreation Department Park User Surveys by Sunregion Associates, Inc. <sup>1</sup>August 5 - Sept. 3, 1984. <sup>2</sup>July 28 - Sept. 3, 1984.

### 2. Age Distribution of Sierra Estrella Golf Course Visitors

According to survey data collected at the Sierra Estrella Golf Course in April, 1987, the median age of players was 41.7 years. The median age of golfers in this survey is considerably older than the median age of visitors at both Estrella Mountain Regional Park and other selected regional parks reported in Table 22.

### 3. Frequency of Visits and Average Party Size

Table 23 indicates that both the median and average number of visits to Estrella Mountain Regional Park are somewhat higher than the comparable averages for other selected regional parks. In addition, the average party size at Estrella Mountain Regional Park is also larger than at the other selected regional parks.

**Table 23**  
**Frequency of Visits and Average Party Size of**  
**Visitors to Estrella Mountain Regional Park**  
**and Other Selected Regional Parks**  
**(In Percentages and Average Number of Visits)**

<u>Frequency of Visits</u>	<u>Estrella Mountain Regional Park</u>	<u>Other Selected Regional Parks</u>
1st Visit	32.5	38.0
2-4 Visits	33.9	30.8
5-9 Visits	12.3	14.1
10-19 Visits	7.2	8.4
20 or more	14.1	8.7
Total	100.0	100.0
Respondents	587	1,231
Median No. Visits	3.5	3.2
Average No. Visits	6.5	5.4
Average Party Size	3.9	3.1

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Source: Same as previous table.

#### 4. Length of Visit

Based on survey responses (128) at Estrella Mountain Regional Park in May, June, July, and August, 1987, the typical visitor stays at the park just over 5 hours. Picnickers average close to 4 1/2 hours per visit. It should be noted that it is very likely that park visitors stay longer during visits in the cooler months such as February, March, April, October, and November.

#### 5. Visitor Participation

Table 24 reports the activities participated in by visitors to Estrella Mountain Regional Park during the survey periods. In many instances, as would be expected, visitors engage in more than one activity and in such case each separate participant activity is noted in the table. Clearly, although many activities are important, Table 24 indicates that picnicking is the most important participant activity at Estrella Mountain Regional Park.



Table 24  
 Activities Participated in by Visitors to Estrella Mountain  
 Regional Park During Survey Periods

<u>Activity</u>	<u># of Activity Occurrences</u>	<u># of Activity Occurrences as % of 595 Respondents Listing Activities</u>
Picnic	494	83.0 <sup>1</sup>
Unorganized Play	107	18.0
Relax and Socialize	92	15.5
Softball/Baseball	51	8.6
Special Events	50	8.4 <sup>2</sup>
Nature Study	26	4.4
Playground Equipment	23	3.9
Enjoy Scenery	22	3.7
Volleyball	20	3.4
Camping	19	3.2
Drinking	16	2.7
Pleasure Driving	14	2.4
Horseback Riding	14	2.4
Golf	14	2.4
Hiking	13	2.2
Football/Soccer	8	1.3
Jogging/Running	7	1.2
Horseshoes	3	.5
Motorbikes/Bicycles	3	.5
Other	3	.5

Source: Maricopa County Parks and Recreation Department; and, Sunregion Associates, Inc. <sup>1</sup>Activities counted as picnicking include barbecues, eating, cookouts, and picnics. Also, 42 of the 49 special event groups are reflected in the picnic totals. <sup>2</sup>Special events include reunions, parties, organizational events and the like.

## G. CHARACTERISTICS OF GROUP VISITORS

During fiscal year 1986-87, as a result of the availability of group visitation data from the Maricopa County Parks and Recreation Department, it has been possible to identify the types of groups visiting the park. Four group classifications have been noted: 1. corporations and businesses including units of government; 2. organizations, except religious groups; 3. religious groups; and, 4. family groups, as well as other groups having parties and reunions.

In sum, 265 groups representing nearly 38,200 visitors made reservations at Estrella Mountain Regional Park during fiscal year 1986-87. Group visitation represented over 10 percent of total visitation during the fiscal year.

Of the group visiting, 37.4 percent were corporate groups, 36.5 percent were organizations, 17.4 percent families, parties, and reunions, and 8.7 percent religious groups.

### 1. Monthly Visitation by Group Visitors

Monthly group attendance at Estrella Mountain Regional Park during fiscal year 1986 - 1987 is shown in Table 25. This data shows (as did Table 18) that June, July, August, and September are the slowest summer months in terms of visitation, while December and January are the slowest winter months.

Table 25  
Monthly Group Visitation to Estrella Mountain Regional Park  
in Fiscal year 1986-87  
(In Percentages)

<u>Month</u>	<u>Annual Visitation</u>	<u>Month</u>	<u>Annual Visitation</u>
July	2.0	January	.8
August	1.5	February	7.3
September	3.1	March	7.6
October	22.1	April	19.7
November	13.6	May	15.1
December	3.4	June	3.7

Source: Maricopa County Parks and Recreation Department; and, Sunregion Associates, Inc.

## 2. Group Size

As noted in Section G, 265 groups visited Estrella Mountain Regional Park in Fiscal Year 1986-87. The average size of each group was 144. Nearly 69 percent of the groups had fewer than 150 persons, with these groups accounting for about 40 percent of all group visitors.

Other groups by size and visitation share are as follows: groups with 151 - 375 persons represented 26 percent of all groups and accounted for 27.8 percent of group visitors; groups with 376 - 750 accounted for 3.4 percent of all groups and 12.3 percent of group visitors; and, groups larger than 751 represented 1.6 percent of all groups and 19.6 percent of group visitors.

## 3. Length of Visit

Based on group reservation data, groups reserved space for an average of 8 hours during Fiscal Year 1986-87.

## 4. Group Participation

Group reservation data suggests that the primary activity of about 88 percent of the groups visiting Estrella Mountain Regional Park in fiscal year 1986-87 was picnicking. Horse related activities accounted for 5.3 percent of all groups primary activities, weddings 2 percent, and dog shows and other types of shows 2 percent.

## H. PHOENIX METROPOLITAN AREA RECREATIONAL PARTICIPATION TRENDS

As shown above in Table 24, users of the existing park facilities at Estrella Mountain Regional Park engage in a broad mix of activities. Table 26 provides an indication of the type of activities which have been growing in popularity and those which have been declining in the Phoenix Metropolitan Area during the past several years. Section I below reviews the survey results for suggested user improvements at Estrella Mountain Regional Park.

**Table 26**  
**Recreation Participation Trends in the Phoenix Metropolitan**  
**Area from 1981 to 1987**  
**(Number of Adults and Percentages)**

	Year End Estimates						%Chg. 81-86
	1981	1982	1983	1984	1985	1986	
Pop.	1,533,583	1,605,500	1,660,500	1,721,300	1,830,100	1,922,600	25.4
Adults <sup>1</sup>	1,057,583	1,154,500	1,226,000	1,257,400	1,336,000	1,406,300	33.0
Adult Participation in Past 12 Months <sup>2</sup>							
Activity							
Swimming	776,200	725,000	873,300	883,700	874,600	959,000	23.6
Bicycle	505,400	421,500	527,800	448,700	489,100	551,100	9.0
Backpack/ Camping	455,800	445,700	480,700	444,900	494,600	544,200	19.4
Hunting/ Fishing	394,800	367,700	423,700	412,900	407,000	439,800	11.4
Bowling	308,100	299,100	297,000	334,100	293,600	396,200	28.6
Jogging/ Running	354,100	333,700	402,400	308,600	339,600	385,700	8.9
Golf	240,600	207,200	271,600	273,800	266,200	382,200	4
Boating	274,800	254,200	305,300	302,200	293,700	298,700	8.7
Racq.B.	208,400	208,800	220,700	217,200	197,900	249,000	19.5
Tennis	203,100	158,400	196,100	186,400	173,600	218,500	7.6
Tubing	--	191,300	228,900	217,200	205,800	215,900	12.9
WaterSki	123,600	151,000	183,300	148,700	201,400	190,900	54.5
Horseback/ Riding	159,600	140,100	152,400	174,400	164,600	175,400	9.9
Snow Ski	76,600	128,600	109,800	127,400	165,900	160,200	5
Flying	--	52,500	--	38,300	33,000	50,000	-4.8
Ballooning	--	19,900	37,900	25,800	33,100	22,700	14.1
Restr. <sup>3</sup>	1,001,200	801,100	1,125,400	1,160,600	1,199,900	1,282,000	28.1
Barbecue	759,700	668,400	814,500	860,200	858,600	936,500	23.3

Source: Inside Phoenix, 1982-1987; and, Sunregion Associates, Inc. <sup>1</sup>Adults 18 and over. <sup>2</sup>Participated in activity anytime in preceding 12 months. <sup>3</sup>Sit-down restaurant. <sup>4</sup>Golf participation increased over 58 percent from 1981-1986 with most of the increase from 1985-86. This increase is probably overstated. <sup>5</sup>109.4 percent increase.