

Estrella Mountain Regional Park

Master Plan Update
2016-2036



Maricopa County
Parks and Recreation

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Date of Master Plan amendments or updates:

Date	Activity
1964	Master Development Plan (original)
1967	Casey Abbott Semi-Regional Park Master Development Plan
1975	Casey Abbott Recreation Area Master Development Plan
1988	Estrella Mountain Regional Park Long-Range Master Plan
2016	Estrella Mountain Regional Park Master Plan update

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C-30-14-020-P-00

Estrella Mountain Regional Park Master Plan Update (2016-2036)

Recommended by:

MARICOPA COUNTY PARKS AND RECREATION DEPARTMENT



6/1/16

R.J. Cardin

Date

Director, Maricopa County Parks and Recreation Department

Approved by:

MARICOPA COUNTY BOARD OF SUPERVISORS



JUN 08 2016

Clint Hickman, Chairman

Date

Attest



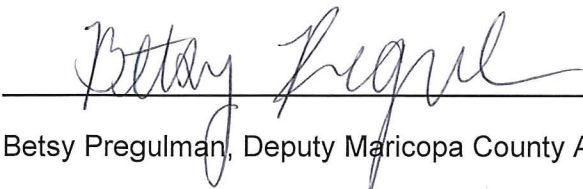
JUN 08 2016

Fran McCarroll, Clerk of the Board

McCarroll

Date

Approved as to Form:



6-7-16

Betsy Pregulman, Deputy Maricopa County Attorney

Date



Maricopa County
Parks and Recreation



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United States Department of the Interior



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APR 12 2016

R. J. Cardin, Director
Maricopa County
Parks and Recreation Department
41835 N. Castle Hot Springs Rd – Unit Operations Center
Morristown, AZ 85342

Dear Mr. Cardin:

This is in response to a request from Leigh E. Johnson, of your staff, to review and comment on the Estrella Mountain Regional Park Master Plan Update (2016-2036) on lands patented to Maricopa County (02-76-0037, 02-72-0037 and 02-66-0070) under the Recreation and Public Purposes (R&PP) Act of 1926.

The Bureau of Land Management has reviewed the Master Plan Update and determined that the proposed improvements are consistent with the R&PP Act and the patents listed above. It is our understanding that your Department intends on presenting this Master Plan Update to the Board of Supervisors in the near future. Once approved by the Board, please notify this office and the appropriate files will be noted with the Master Plan Update.

If you have any questions, please contact Jim Andersen at (623) 580-5570.

Sincerely,

Edward J. Kender
Field Manager

cc: Leigh E. Johnson
Maricopa County
Parks and Recreation Department
41835 N. Castle Hot Springs Rd – Unit Operations Center
Morristown, AZ 85342

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Acknowledgements

This master plan update was a collaborative process that involved the guidance and expertise of many. The Maricopa County Parks and Recreation Department would like to thank the Planning Team who committed their time to meetings and document review; likewise to the Stakeholder Advisory Group (detailed in Appendix A) who took time out of their schedules to provide their invaluable input.

The Planning Team was skillfully guided by Facilitator, Ms. Cate Bradley of the National Park Service via a grant from the [Rivers Trails Conservation Areas](#) program. Her expertise and thoughtful input was greatly valued by all.

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This Master Plan update was made possible by the contributions and guidance of the following:

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The Department would also like to thank its agency partners at the Maricopa County Department of Transportation, Maricopa County Sheriff's Office, Mountain Patrol Division, Arizona Game and Fish Department, Bureau of Land Management – Lower Sonoran Field Office, City of Goodyear, and the City of Avondale for their input and guidance.

The Maricopa County Parks and Recreation Department would also like to thank the tireless efforts of the park staff and volunteers, without whom the park could not operate. Additional gratitude is extended to all the youth group participants and public meeting attendees who offered their valuable comments and suggestions.



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Glossary of Terms and Abbreviations

Term	Definition
ADA	American's with Disabilities Act
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AMA	Active Management Area
APS	Arizona Public Service Company
ASU	Arizona State University
ARS	Arizona Revised Statutes
AST	Described as a 2,000-gallon steel tank enclosed in a concrete vault and is adequate under EPA guidelines to provide secondary containment
AZGFD	Arizona Game and Fish Department
AZGS	Arizona Geological Survey
ASLD	Arizona State Land Department
BOS	Board of Supervisors
BLM	Bureau of Land Management
CIP	Capital Improvement Plan
CO	Carbon monoxide
County	Maricopa County
DIP	ductile iron pipe
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ET	Evapotranspiration
EIS	Environmental Impact Statement
EYS	Estrella Youth Sports
°F	Degrees Fahrenheit
FCD	Flood Control District of Maricopa County
FEMA	Federal Emergency Management Agency
FTE	Fulltime Equivalent (employee)
FY	Fiscal Year
GIS	Geographic Information System
GPS	Geographic Positioning System
GRIC	Gila River Indian Community
HDMS	Heritage Data Management System
HUC	Hydraulic Unit Code
HURF	Highway User Revenue Fund
I-	Interstate (number)
IBA	Important Bird Area
IGA	Intergovernmental Agreement
LEED	Leadership in Energy & Environmental Design
LMP	Lightscape Management Plan
MAG	Maricopa Association of Governments
MCDOT	Maricopa County Department of Transportation
MCPRD (or Department)	Maricopa County Parks and Recreation Department
MCSO	Maricopa County Sherriff's Office

Term	Definition
MOU	Memorandum of Understanding
MPA	Municipal Planning Area
n.d.	No date
NORA	Notice of Reality Action
NOx	Nitrogen Oxide
OHV	Off-Highway Vehicle
PIR	Phoenix International Raceway
PM	Particulate Matter
RAE	Recreation Activity Evaluation
R&PP	Recreation and Public Purposes Act
RU-	Rural Residential
RTP	Regional Transportation Plan
RV	Recreational Vehicle
SAG	Stakeholder Advisory Group
SERI	Species of Economic and Recreational Importance
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Office
SPCC	Spill Prevention Control and Countermeasures Plan
SR-	State Route (number)
SWAP	State Wildlife Action Plan
USFWS	U.S. Fish and Wildlife Service
VOC	Volatile Organic Compounds
VRM	Visual Resource Management

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CHAPTER 1 – INTRODUCTION

This chapter introduces the concept of a regional park and a general overview of the project, the vision, mission, and theme(s) of the park. The regional park fills a void between city, state, or national parks. Regional parks are located outside the metropolitan area (although with rapid development, this is becoming less and less the case) but within a reasonable driving distance to the population for which it was planned and attempts to maintain a buffer from urban encroachment.

A regional park is defined as a natural, unspoiled area providing its visitors an escape from city trappings, with enough space and facilities for day and overnight use. A regional park provides opportunities for passive and active recreational activities (e.g. hiking, walking, horseback riding, picnicking, camping, nature study and sightseeing) that allow its visitors to unwind and immerse themselves in nature. A regional park may have unique topography and scenery or hold special historical or archaeological interest. A regional park may also provide a blend of unspoiled nature, wilderness preserve and refuge, and open space, offering its visitor(s) a sense of remoteness.

Its development, phased in over time, is geared toward facilities that encourage enjoyment of the natural environment while still providing some comforts of home. All development is carefully patterned and designed to conform to the landscape, avoiding a crowded feeling, and typically includes a nature center, picnic tables and shelters, campsites, a trail system, and adequate support facilities (parking, restrooms, concessions, etc.).

Therefore, the regional park system serves to preserve the mountains, canyons, native vegetation and wildlife in their natural state while also encouraging the enjoyment of these natural resources by providing well planned and appropriate facilities. Estrella Mountain Regional Park, one of ten Maricopa County regional parks or conservation areas, offers the opportunity to picnic, hike or explore, and satisfies our primitive instincts and restores our sense of well-being.

1.1 Project Background

The Estrella Mountain Regional Park entered the Maricopa County park system in 1954 and its first master plan was written in 1965 and last updated in 1988 with several iterations in between. Many components of the master plan have never come into fruition while at the same time public use often dictates when and where development occurs. This update to the master plan is to bring those disparities back into alignment and to steer future development of the park. This plan is based on a 20-year outlook and should be referred to on a regular basis and updated if needed. This plan is meant to be flexible while also providing long-term direction to the Park Supervisor, senior management, the public, and other interested parties while continuing to protect the park's resources both natural and built.



Estrella Mountain Regional Park is a component of the Maricopa County regional park system and is to date the third largest at 19,803 acres and features rugged mountain terrain, gentle foothills, and open valley views. The system includes ten parks or conservation areas that comprise over 120,000 acres and encircle the Phoenix metropolitan area. The park system provides recreational and educational opportunities for residents and visitors alike.

1.2 Vision, Mission, and Theme

This plan is meant to align with the vision and mission of the Maricopa County Parks and Recreation Department (MCPRD or Department). The park’s unique combination of wilderness and cultural interests automatically provides a basic direction for the park’s planning and development and is subsequently reflected in the park’s operational and marketing themes.

1.2.1 Vision and Mission

This plan aligns with the vision and mission set forth by the Department. The vision and mission are:

“Our vision is to connect people with nature through regional parks, trails and programs, inspire an appreciation for the Sonoran Desert and natural open spaces, and create life-long positive memories.”

“Our mission, through responsible stewardship, is to provide the highest quality parks, trails, programs, services and experiences that energize visitors and create life-long users and advocates.”

1.2.2 Themes

The 1988 Estrella Mountain Regional Park Long-Range Master Plan noted that the park possesses a unique potential to serve the needs of the region due to its proximity to the confluence of three rivers, the Salt, Gila, and Agua Fria. It also noted that the park could serve as a destination to a regionally significant trail system or function as a starting point for destinations beyond the park (BRW, 1988). Additionally, MCPRD has established similar operational and marketing themes that acknowledge its proximity to these important waterways.

Operational Theme

The Estrella Mountain Regional Park Master Plan update is aligned with the Maricopa County Parks and Recreation 2009 Strategic System Master Plan that recommends maintaining the park as a “*destination*” park. As such, its priority mandates have been identified in Table 1-1:

Table 1-1: Themes and Mandates

Maricopa County Park	Estrella Mountain Regional Park
Operational Theme	Destination Park
Priority Mandates	
1 –Strategically develop facilities that increase the revenue generating capacity of the park and park system.	
2 – Preserve the natural setting and environmental aspects of the park by heavily restricted use and limited public access.	
3 – Devote resources to the repair and replacement of existing infrastructure.	
Source: Maricopa County Parks and Recreation Strategic System Master Plan, June 2009, page 193.	



Until a new department-wide strategic plan is implemented that changes these priority mandates, any proposed park improvement project (i.e. capital development or programmatic change) should support one or more of these mandates.

Marketing Theme

Complimentary to its operational theme, each park also carries a marketing theme. Shortly after the 2009 Strategic System Master Plan was adopted, each park developed a “theme” that best represents the park’s spirit or essence. The themes were vetted through community focus groups and park staff meetings. A number of park values were identified during this process (e.g. turf, baseball fields, history, equestrian trails, and others); however, the key features identified for Estrella Mountain Regional Park were “*riparian habitat*” and “*El Rio*”. This emphasis on the riparian experience was carried forward in the MCPRD Marketing Plan as its marketing theme.¹

Although the park has many amenities to offer from mountain biking to picnicking, with the impressive natural and cultural assets of the park, there are ample opportunities to promote this theme by providing additional or improved facilities. Any proposed programming should also keep these themes at the forefront.

¹ Themes are further outlined in MCPRD Connecting People with Nature Marketing Plan (12/6/11 revision), page 43.



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CHAPTER 2 - MASTER PLAN PROCESS

This chapter provides the purpose of the master plan and reviews the master plan update process, including the public participation program, planning issues, and a recreation activity evaluation conducted during the project. This is the second master plan update the Department has undertaken in recent years and uses the White Tank Mountain Regional Park Master Plan Update (2014-2034) as its template.

The planning process for this project involved numerous tasks and relied on input from the planning team and other key Department staff members, a stakeholder advisory group, and the general public over the course of two years. Some tasks were completed simultaneously but entailed gathering or analyzing different sets of information. Each task was tracked on a timeline to provide direction to the planning team.

This park, already unique to the park system, posed a variety of challenges throughout the planning process. Further, the park was approached by outside entities with development proposals. These challenges were welcomed and, when appropriate, proposals were folded into the park improvement recommendations, but which ultimately extended the timeline of the process.

2.1 Purpose of the Master Plan

The purpose of this plan is to update the 1988 Long-Range Master Plan to reflect current use of the park as well as to identify and address community needs and concerns, characterize and evaluate environmental resource information, and identify other potential recreational opportunities suitable for inclusion in the park.

The ultimate purpose of developing a park master plan is to outline the long-range vision for the park as well as to guide development priorities that will provide for both the public's enjoyment and the protection of the park's resources. The master plan provides a conceptual planning framework for establishing those priorities. It will also assist the park with upholding the standards for a "Quality County Park System" per the 2009 Strategic System Master Plan.

2.2 Previous Planning Efforts

Several plans played an important role in shaping this master plan. Specifically, the 2009 Strategic System Plan guides the decision-making for future development and management of the park system; it also provides recommendations on how the park system might improve itself. The Connecting People with Nature Marketing Plan took additional steps to identify the predominate feature(s) of each park and promote a "theme" for each as well as a timeline for implementation of that theme. The annual business plan will outline short-term projects and goals to further enhance or maintain park resources.

This plan consulted the following list of County plans and other documents:



- Maricopa County Regional Park System Plan (1965)
- Casey Abbott Semi-Regional Park Master Development Plan (1967)
- Casey Abbott Recreation Area (1975)
- Estrella Mountain Regional Park Long-Range Master Plan (1988)
- [Maricopa County Regional Trail System Plan \(2004\)](#)
- [Parks and Recreation Strategic System Master Plan \(2009\)](#)
- 2012-2013 Visitor Study Final Report (by ASU) (*and previous versions*)
- Cultural resource surveys (*various*)
- Integrated Contingency Plan, Spill Prevention, Control and Countermeasure Plan; Storm Water Pollution Prevention Plan (n.d.)
- [Maricopa County Strategic Plan](#)(n.d.)
- Maricopa County Vision 2030 Comprehensive Plan (draft)
- Maricopa County Sustainability, [Advancing Regional Sustainability](#), (n.d.)

2.3 Plan Amendments or Updates

This plan should be reviewed annually by park staff to insure their knowledge of and adherence to this plan and to evaluate implementation progress. At a minimum, this plan should be revised and updated every 20 years to take the changing needs of the County and the community into consideration.

If any major and/or sudden changes take place prior to the 20-year mark, an update or amendment may be needed. Major amendments to this plan may require public notification and as such, all potential changes should be reported to executive management and planning staff for consideration. Major amendments may include changes to the Management Zone; adjacent land use changes or development that impacts the park; acts of nature that dramatically alter the park; any other action that would permanently affect the land; and/or a proposed action that is not within the scope of the master plan.

Minor amendments or updates to the plan should be made as needed and do not require public participation or formal approval. This includes updating demographic and other statistical information; updates to appendices such as insertion or removal of annual reports (such as business plan, marketing plan, etc.); new or updated resource information; and/or to correct grammatical or formatting issues. Minor amendments or updates should be reported to executive management and planning staff for consideration.

2.4 Agency Participation Program

2.4.1 Department Participation

The master plan update was developed internally by Department planning staff, park staff, and senior level management. Department staff worked individually and met as a group throughout the planning process in order to define the scope of the master plan, review project information, consult stakeholders and the public, and develop and analyze draft park improvement projects, and to finalize the master plan update.

2.4.2 Parks and Recreation Commission

Department planning staff provided periodic updates or presentations to the Parks and Recreation Commission and invited them to provide feedback. These meetings were open for the public to attend



and make comments; however, no members of the public provided feedback during these meetings. Presentations or updates were given on the following dates:

- July 15, 2014
- November 18, 2014
- May 19, 2015
- November 17, 2015
- March 15, 2016

The Parks and Recreation Commission provided their approval recommendation during the March 15, 2016 meeting.

2.4.3 Board of Supervisors

This plan was ultimately presented to the Board of Supervisors (BOS) for their approval. These meetings are also open to the public. The BOS approved this plan as acknowledged on the signature page in the front of this document.

2.4.4 Agency Participation

Department planning staff engaged its agency partners such as City of Goodyear, City of Avondale, Arizona Game and Fish Department (AZGFD), Maricopa County Sherriff's Office (MCSO), and Maricopa County Department of Transportation (MCDOT) via one-on-one meetings as well as by follow-up phone calls or emails. The Department also invited these and other agencies to attend group stakeholder meetings and public open house meetings where they could provide additional comments. One-on-one meetings or presentations were held:

- City of Goodyear:
 - December 13, 2013, at Goodyear's Ballpark Administration Office
 - May 5, 2014, at Department headquarters
 - April 6, 2016, Parks and Recreation Advisory Commission
- City of Avondale:
 - April 13, 2016 Parks, Recreation, and Libraries Commission
- AZGFD:
 - January 14, 2015 at Department headquarters
- MCDOT (at MCDOT offices):
 - September 2, 2014
 - February 17, 2015
 - April 30, 2015

The majority of park land was acquired by the Department via the Recreation and Public Purposes Act (R&PP) and must remain consistent with R&PP requirements and land patents. As a result, the Department consulted with the BLM and received its written approval of this plan and is found in the front of this document.

Planning staff sought input from Arizona State Land Department by inviting the agency to stakeholder meetings and including them on emails or other notifications. Their comments were taken into consideration into the final plan update to the extent feasible.



Planning staff also sought input from directly adjacent and potentially interested Native American communities regarding this master plan update. An email invitation was sent to the Gila River Indian Community for the second public meeting.

2.5 Public Participation Program

A public participation program was designed by planning staff in order to inform the public of the planning process, to identify recreational needs, and to solicit as much public and stakeholder feedback as feasible. The various components are included and detailed in Appendix A.

2.5.1 Arizona State University (ASU) Park Visitor Study

ASU periodically performs visitor use surveys on behalf of the Department. Visitors are asked questions by an interviewer during an in-park survey. Visitors are also asked to participate in a longer take-home survey and provide more detailed responses to questions. This allows the Department to identify and track trends over time. Survey responses for the year 2012-2013 were taken into consideration when developing park improvement projects.

2.5.2 Partners

The planning team identified several agencies or other parties that the park has either contractual obligations with or engaged in serious discussions with as partners in the planning process. These interests were identified and disclosed at the start of the planning process and were consulted first and early in the process. Later, these partners were incorporated into the larger stakeholder group. Included were:

- Estrella Youth Sports (EYS)
- Centennial Trail (Three Rivers Historical Society)
- El Rio Watercourse Master Plan (Flood Control District of Maricopa County)
- Tres Rios Golf Course
- Corral West (Horse Trail Rides)

2.5.3 Stakeholders

Another component of the public participation program was establishing a list of stakeholders. The stakeholders group is meant to reach out to a broader audience than just the Partners and includes neighboring jurisdictions and other interested parties. The stakeholders met three times between January 2015 and September 2015 at Estrella Mountain Regional Park Nature Center; a list of participants invited to these meetings is included in Appendix A.

- January 29, 2015 (9:00-11:00am)
- March 26, 2015 (8:30-11:30am, site visit)
- September 28, 2015 (2:00-4:00pm)

The group's comments and concerns were integrated into the planning process and assisted in the development of the recommended park improvements. Comments received during these meetings reflected a general concern for trails and trail maintenance, turf management, and potential upgrades to the park. Briefly, those comments included:



- Baseline Trail is a gem being so close to the nature center but is in serious disrepair
- Improve the Competitive Track facilities (e.g. install a restroom)
- Improve the turf field area
- Provide camping for both RV and tents



Figure 2-1: Stakeholder's site visit

2.5.4 Youth Involvement

After the first Stakeholder meeting, it became clear that youth engagement and input was needed. As a result, Department planning staff met with three youth groups in the southwest valley. First, planning staff gave a presentation to the City of Goodyear Youth Commission on March 25, 2015 at its City Hall. Feedback from the Youth Commissioners included:

- Include sand volleyball
- Competitive track needs better signage and maintenance
- Need better marketing; unaware of park and opportunities; utilize social media
- Provide river access for school groups for educational use
- Offer more family-oriented events

Department planning staff attended "Global Youth Service Day" sponsored by the City of Avondale Youth Commission on April 11, 2015. Department staff held mini-focus groups with the Service Day participants. Feedback included:

- Like "green" areas, trees, water, shade, seating, restrooms, and playgrounds
- Like spending time with family and friends
- Need open areas for multiple uses and sports activities
- Like a natural look; keep cities out of parks
- Important to protect mountain parks/open space while we still have it



Figure 2-2: Planning staff listens to Youth Day participants

Department planning staff also attended a youth group meeting at Mt. Pleasant Baptist Church in the City of Buckeye on August 16, 2015. This meeting entailed a brief presentation and a group discussion regarding outdoor recreation preferences. Feedback included:

- Water bottle filling stations
- Shade
- Water access
- Less metal features as it gets too hot
- Skate park



- Signage on trails to identify plants or animals
- Misters at shaded areas
- Indoor interactive, computerized learning experience area
- Lighted ball fields (football, sand volleyball, tennis)
- Shaded resting areas at trails
- Rock climbing
- Indoor education regarding plant life
- Important to protect these areas for its beauty and nature experience before it's lost

2.5.3 Public Open House Meetings

The public was notified of the planning process and their feedback was sought through two public meetings. Additional comments were captured through surveys or comment cards, the park website, letters or email, discussions with citizens, and social media.

Surveys and/or feedback forms were provided at each public meeting to gather the public's opinion. Each meeting was followed by a 30-calendar day open comment period to collect the needs and preferences of those who were unable to attend the meeting(s) in person. Also during these 30-day periods, poster boards were left on display at the park's nature center with comment forms available for the community to review and provide additional feedback.

Public Meeting One

The first public meeting was held April 30, 2015 (6:00-8:00pm) at the Park's Nature Center where 41 people signed in and 15 comment cards and over 40 sticky notes were collected. Of those who specified their preferred activity, bicyclists and mountain bikers (15%) represented the largest share of respondents, followed closely by hikers (14%).

Over 70 additional responses were received during the open comment period of April 30 to May 30, 2015. Comments received indicate a mixed level of support for the proposed sports field development project; other respondents expressed their desire for additional trail options and improved trailhead amenities (however, many comments were deemed outside of the scope of this master plan update). Comments were posted on the Park's project webpage. Briefly, other comments included:

- A general desire for additional trail options and trailhead improvements.
- "Have an entrance that stands out. People see golf course not park."
- "The park could use some changes but massive sports fields is not the way."
- "[The sports field development] is a good idea. The park needs users and this brings them in."
- "Please keep Estrella horse friendly. Corral West Adventures has really made a difference at the park."



Figure 2-3: Meeting participants make notes on wall map



Public Meeting Two

The second public meeting was held January 30, 2016 (10:30am-12:30pm) at the Park's Nature Center where 36 people signed in; no comment cards were received during the meeting. Planning staff presented the two draft park improvement alternatives and answered questions throughout the presentation and afterward. Topics that were raised during verbal conversations with the public included:

- Increase annual pass fee and fees in general
- Preference for a walk-in gate and iron-ranger near Indian Springs Road
- Eager for a Maricopa Trail connection
- Trail and trailhead improvements are needed
- Camping at the rodeo arena is a good idea
- Fix ramadas or remove them if they are not salvageable



Figure 2-4: Meeting participants ask questions

Fifty-six additional responses were received during the open comment period of January 30 through February 29, 2016 via Survey Monkey, an online survey service, and via comment forms at the Nature Center. The public was asked to indicate which draft alternative they most preferred. The majority of respondents (76%) indicated draft alternative B was most preferred.

The public was also asked what they liked most and what they would change from their chosen alternative. Trails, again, were the subject of most comments – including a general desire for additional trail options and trailhead improvements. Mountain bike trails were commonly mentioned (i.e. to install mountain bike style jumps, turns, and other elements). Briefly, other comments received included:

- “Ramada renovation/development”
- “Added camping RV and primitive”
- “Backcountry campsites not just close-in primitive sites”
- “Keep the park raw untouched desert as much as possible”
- “Need more camping spaces”
- [Add] “full hook-up sites, water, electric”

2.5.4 Project Website

Information was posted on the Park's “Projects” webpage to keep the public and other interested parties apprised of the planning process. (The Department website was remodeled in early 2016 and some links may no longer be valid.)

- <http://www.maricopa.gov/parks/estrella/emproject.aspx>
- <http://www.maricopacountyparks.net/park-locator/estrella-mountain-regional-park/park-information/park-projects/>

2.5.5 Media and Social Media Coverage

A general press release was issued to announce public meeting dates at least 30 calendar days prior to each meeting and was made available on the County and Department webpages. These news outlets published (or posted online) the press releases:



- County news: http://www.maricopa.gov/pr_detail.aspx?releaseID=2854
- County news: http://www.maricopa.gov/pr_detail.aspx?releaseID=2874
- County news: http://www.maricopa.gov/pr_detail.aspx?releaseID=3115
- County events calendar:
<http://www.maricopa.gov/parks/estrella/EventsDetailPublishers.aspx?date=4/30/2015&EventID=24278>

Facebook¹ and Twitter² were also utilized as reminders for the public open house meeting dates. Comments were also retrieved from these social media sources during the open comment periods to the extent possible and considered with all other comments.

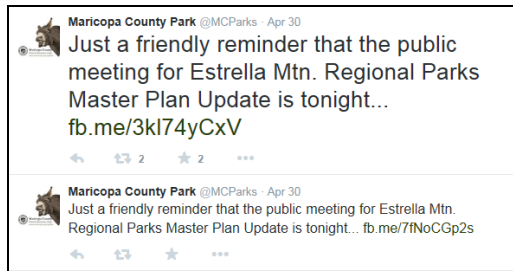


Figure 2-5: Twitter message, April 30, 2015

The County newsletter delivery system, GovDelivery or GovDocs, was also used to distribute newsletters/bulletins and updates to its email-based subscribers. Interested parties were encouraged to register to the subscription service in order to receive updates or other notifications related to the park. The GovDelivery system offers analytics that can be used to test the system’s effectiveness, whereas other platforms may not.

Date Sent	Recipients	Delivery Rate	Total Opens
May 18, 2015	1,380	99%	432 ¹
Dec. 21, 2015	1,418	99%	125 ²

¹ Between May 18 and June 15, 2015
² As of December 21, 2015

2.6 Planning Issues

Tight budgets and staffing are typically the top planning issues. Budgets and staffing will impact all areas of the park and are always of concern. The budget will dictate the number of staff employed at the park and the number of park improvement projects that can be successfully completed.

Additional factors that affected the planning process included existing conditions, trends and other issues both inside and outside of the park. The park is facing a variety of challenges from aged facilities and infrastructure, declining visitation, changing demographics, and changing recreational use activities and patterns (for example, the shift away from picnicking towards increased trail uses as the primary activity). The park also faces pressures from adjacent land use and development; this includes newer

¹ Estrella’s Facebook page: <https://www.facebook.com/EstrellaMtnPark>

² MCDPRD Twitter page: <https://twitter.com/mcparcs>



residential developers that are required by city planning code or ordinance to include neighborhood parks, trails, and/or open space into their development. The inclusion of outdoor recreational spaces in neighborhoods provides its residents with new options for how they recreate that were not available to them previously. These topics are presented in Chapter 3.

Notwithstanding that, the diverse planning issues identified during scoping for the project were identified by the Planning Team and can be grouped into five major categories: develop new facilities; maintain/rehabilitate existing facilities; education/interpretation; administrative; and resource protection. The park improvement recommendations, as detailed in Chapter 7, will address these concerns while supporting the park's priority mandates and themes.

2.7 Recreation Activity Evaluation (RAE)

A Recreation Activity Evaluation (RAE), table 2-2, was prepared to identify various recreational opportunities appropriate for consideration in the park. In the RAE, potential park recreational uses were compared against environmental resource management, operational, and other criteria. Throughout the process, the vision statement, operational theme (destination), and its three priority mandates were used to guide development and evaluation of the alternatives.



Table 2-2: Recreation Activity Evaluation (RAE)

Type	Recreational Activity	Complies with MCPRD Policy	Supports Park's Theme(s)	Supports one or more Park Priority Mandate	Public Interest			Public Opposition			Regional Availability			Potential Site Disturbance			Infrastructure Requirement			Operations & Maintenance			Potential Revenue			Considered for ES Draft Master Plan
					L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	
Camping	Recreational Vehicle (RV)	Yes	Yes	Yes	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Yes
Camping	Tent	Yes	Yes	Yes	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Yes
Camping	Equestrian-based	Yes	Yes	Yes	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Yes*
Trails	General trailhead improvements	Yes	Yes	Yes	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Yes
Trails	Peak view trail	Yes	Yes	Yes	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Yes
Trails	Comp Track improvements	Yes	Yes	Yes	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Light Green	Medium Green	Dark Green	Yes
Picnic	Ramada upgrades	Yes	Yes	Yes	Light Purple	Medium Purple	Dark Purple	Light Purple	Medium Purple	Dark Purple	Light Purple	Medium Purple	Dark Purple	Light Purple	Medium Purple	Dark Purple	Light Purple	Medium Purple	Dark Purple	Light Purple	Medium Purple	Dark Purple	Light Purple	Medium Purple	Dark Purple	Yes
Interp/Education	Signage upgrades or other displays	Yes	Yes	Yes	Light Orange	Medium Orange	Dark Orange	Light Orange	Medium Orange	Dark Orange	Light Orange	Medium Orange	Dark Orange	Light Orange	Medium Orange	Dark Orange	Light Orange	Medium Orange	Dark Orange	Light Orange	Medium Orange	Dark Orange	Light Orange	Medium Orange	Dark Orange	Yes
Interp/Education	Butterfly garden	Yes	Yes	Yes	Light Orange	Medium Orange	Dark Orange	Light Orange	Medium Orange	Dark Orange	Light Orange	Medium Orange	Dark Orange	Light Orange	Medium Orange	Dark Orange	Light Orange	Medium Orange	Dark Orange	Light Orange	Medium Orange	Dark Orange	Light Orange	Medium Orange	Dark Orange	Yes
Shooting	Shooting range	Yes	No	Yes	Light Red	Medium Red	Dark Red	Light Red	Medium Red	Dark Red	Light Red	Medium Red	Dark Red	Light Red	Medium Red	Dark Red	Light Red	Medium Red	Dark Red	Light Red	Medium Red	Dark Red	Light Red	Medium Red	Dark Red	No
Facilities	Sports fields	Yes	Yes	Yes	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Yes
Facilities	Zipline / Rope course	Yes	Yes	Yes	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Yes
Facilities	Splash Pad	Yes	Yes	Yes	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Yes
Facilities	Brine wetlands	Yes	Yes	Yes	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Yes
Facilities	Super Playground	Yes	Yes	Yes	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Yes
Facilities	Amphitheater	Yes	Yes	Yes	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Light Blue	Medium Blue	Dark Blue	Yes
Other	Turf Grass	Yes	Yes	Yes	Light Yellow	Medium Yellow	Dark Yellow	Light Yellow	Medium Yellow	Dark Yellow	Light Yellow	Medium Yellow	Dark Yellow	Light Yellow	Medium Yellow	Dark Yellow	Light Yellow	Medium Yellow	Dark Yellow	Light Yellow	Medium Yellow	Dark Yellow	Light Yellow	Medium Yellow	Dark Yellow	Yes*
Comments	* Limited to designated area(s) only.																									



CHAPTER 3 – RESOURCE ANALYSIS

The resource analysis for the master plan includes natural, human, and cultural resources that could be affected by any additional development and operation of the park. Inventory of park resources occurred from January 2014 through August 2015. Data collection included reviewing previous reports or documents pertaining to the park and resources in the area, aerial photo interpretation, GIS analysis, agency contacts, and field investigations.

The park consists of 19,796 acres, of which approximately 532 are developed. This amounts to less than 3% of the total acreage that is developed. The 2009 Strategic System Plan¹ provides a guideline to keep developed areas to 10% or less of the total land area (smaller parks that are contiguous to another protected open space may exceed 10%).

A photo monitoring program has been established for the park. Using a digital camera and GIS will allow park staff to return to the same points each year to check for signs of change in any of its visual, cultural or natural resources. This is detailed further in Appendix B.

3.1 General Project Setting

At nearly 20,000 acres, Estrella Mountain Regional Park is the third largest regional park in Maricopa County to date and is located within Sections 1 and 4 – 36 of Township 01 South, Range 01 West; the northwest corner of the park falls within sections 32 and 33 of Township 01 North, Range 01 West. The park is located southwest of the Phoenix metropolitan area, falling within the planning boundaries of both the Cities of Avondale and Goodyear and is shown on Figure 3-1.

The park's mailing address is 14805 West Vineyard Avenue, Goodyear, AZ 85338. The park may be contacted by telephone 623-932-3811 or fax 602-372-8507 or via email at estrellapark@mail.maricopa.gov. Although subject to change, the current park operating hours² are:

Park Hours

Sun-Thu: 6:00am – 8:00pm
Fri-Sat: 6:00am – 10:00pm
365 days a year

Nature Center Hours

Mon-Sat: 8:00am – 4:00pm

Administrative Office Hours

Mon-Fri: 8:00am – 4:00pm

¹ Maricopa County Parks and Recreation, 2009 Strategic System Master Plan, p105.

² Source: park website as of February 22, 2013. Check website for the most current information.

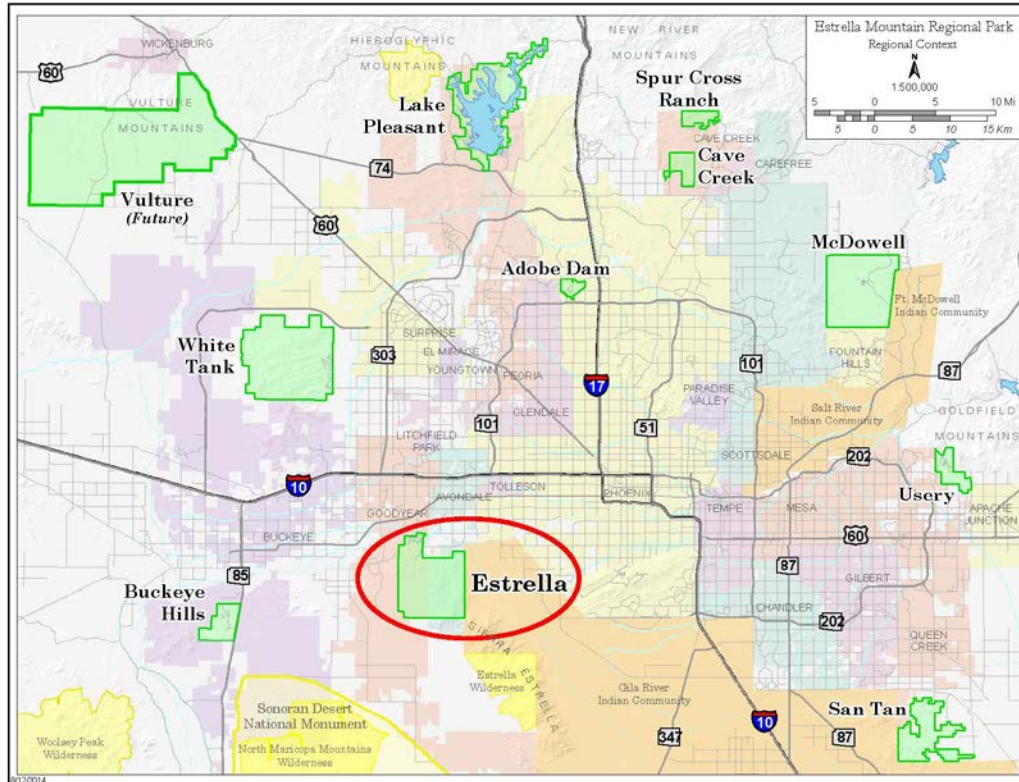


Figure 3-1: Park and Metro-area

3.2 Special Designations

3.2.1 Recreation Resources

El Rio Plant Research Trail

The purpose of this 8.5-acre experimental project is to determine what varieties of native vegetation provide the best flood control measures and to enhance the natural character of the Gila River. Visitors may see Velvet Mesquite, Fremont Cottonwood, Gooding Willow, Creosote Bush, Quail Bush, Towering Saltbush, Ironwood, and Blue Palo Verde and read interpretive panels along the quarter-mile trail. Opened in 2007, this project is a joint effort of the Maricopa Parks and Recreation Department, Maricopa County Flood Control Department, and the Bureau of Reclamation; future cooperative projects are being developed for inclusion in the river bottom.

Maricopa Trail

The Maricopa Trail will eventually make its connection to the park. The trail is part of a regional trail plan that will link all Maricopa County Regional Parks and provide connections with metropolitan areas, municipal trails, communities, and neighborhoods with a regional, non-motorized, multi-modal corridor. The Maricopa Trail will also protect open space corridors and natural and cultural resources from development along its route.



Centennial Trail

On April 24, 2012, the Centennial Trail was designated as an official Arizona Centennial Legacy Project by the Arizona Historical Advisory Commission. The Centennial Trail proposes an educational and looped trail within the park. In addition to educational elements, the trail may also include a water feature. The Three Rivers Centennial Trail at Estrella Mountain Regional Park Master Plan (2012 draft) details this conceptual project further.

3.2.2 Cultural Resources

The park has a long history of human exploration and cultural remnants are often found throughout the park in the form of petroglyphs, old dwellings, and mining test pits. Despite its history, no sites or buildings within the park have been listed by the State Historic Preservation Office on the National Register of Historic Places. Remnants of an old homestead are found deep within the park (figure 3-2).



Figure 3-2: Remnants of past homesteaders

The park contains a number of recorded archeological sites. Among them, one (AZ:T:11:3) is thought to be a former prehistoric village site and may still contain significant archaeological data.

Likewise, a trail used by early pioneers travelling from Phoenix to Little Rainbow Valley called “Pack Saddle Trail” (now a part of Gadsden Trail) bisects the park from northeast to the southwest and has been recognized by SHPO as a historic trail (site file number 1197).

3.2.3 Natural Resources

Wildlife Linkages

AZGFD has extensively researched and recorded critical wildlife linkage areas for the entire county and this part of the Valley (figure 3-3). Wildlife linkage is discussed in Section 3.6.6 Wildlife Linkages. The park is considered a wildlife block due to its adjacency to other vast expanses of undisturbed lands. A wildlife corridor connects the southwest corner of the park to Buckeye Hills to the west and Rainbow Valley to the immediate southwest. Additionally, the area along the Gila River is considered a wildlife linkage corridor for a variety of wildlife species. It is also considered an Important Bird Area (IBA).

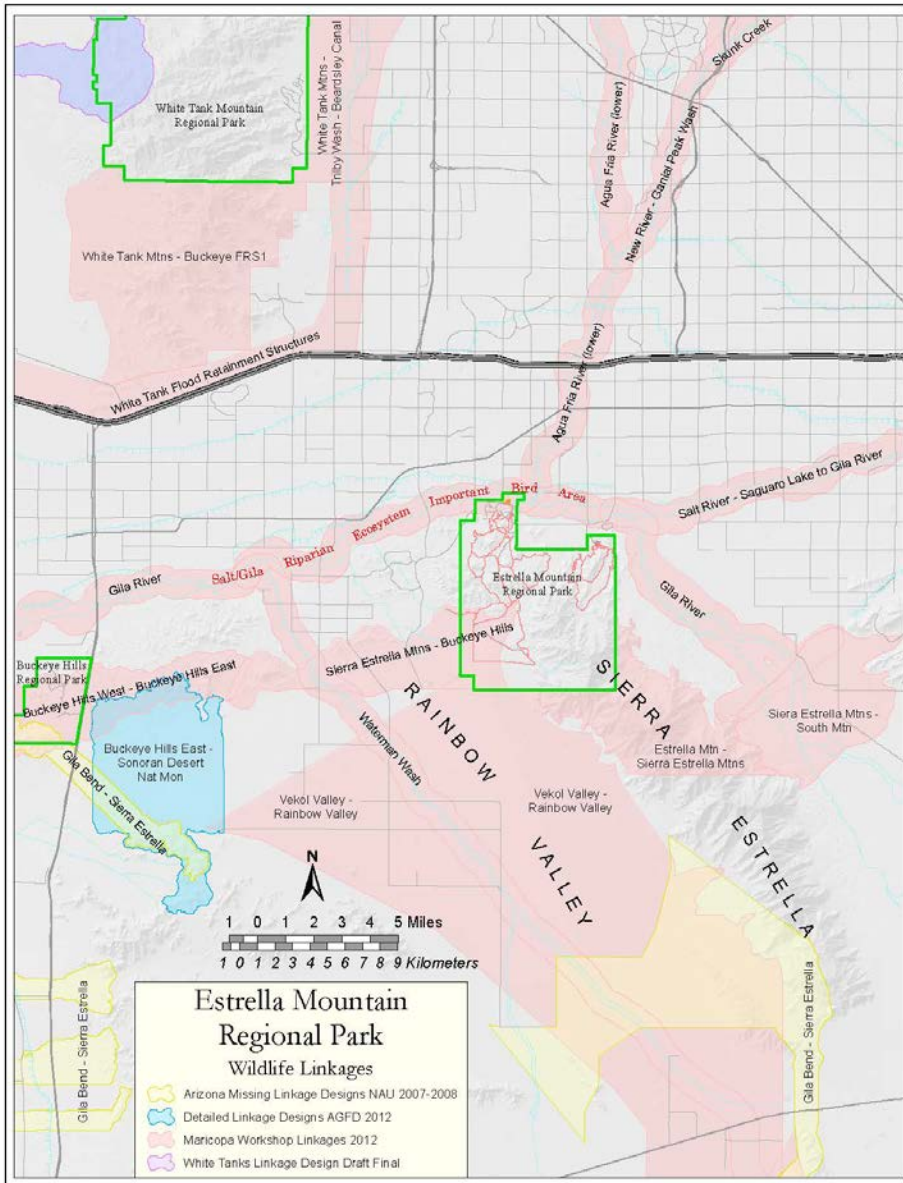


Figure 3-3: Wildlife Linkages (southwest valley)

Hunting

The park allows hunting of mule deer (archery only) and some small game (shotgun only) during specified hunting seasons as regulated by AZGFD. It is illegal and a revocable offense to shoot a firearm within a quarter-mile of any developed picnic area, developed campground, shooting range, occupied building, boat ramp, golf course or other recreational area developed for public use; or to shoot from, on, or across a roadway; or to trespass on private property. A trail is not considered a developed area. Hunting is discussed further in 3.9.3 Hunting. Some hunting occurs in the Gila River corridor.



Non-Attainment or Maintenance Areas³

Maricopa County's Air Quality Department is tasked with protecting the public from airborne particulate matter and with complying with federal, state, and local air quality regulations. Nearly the entire Phoenix metropolitan area falls within the non-attainment area. The following designations remain in effect until the Environmental Protection Agency (EPA) determines otherwise:

[Particulate Matter](#)

Inhalable coarse particulate matter⁴ is sized at either 2.5 (PM2.5) or 10 (PM10) micrometers in diameter and is defined by the Environmental Protection Agency (EPA). The park is entirely within the PM10 Non-attainment Area and subject to dust-control measures. PM10 includes dust, soot, and other tiny bits of solid materials that are released into and move around in the air (either from natural or anthropogenic sources). County inspection reports are kept on file in the park office.

[Ozone](#)

The park is included within the 8-hour Ozone Nonattainment Area boundaries. At ground level, ozone aids in creating smog and is formed by the reaction of VOCs⁵ (for example, photochemical smog) and NO_x⁶ (a reaction of nitrogen and oxygen gases in the air, particularly from motor vehicles) in the presence of heat and sunlight.

[Carbon Monoxide Maintenance Area](#)

The park is partially included in the Carbon Monoxide Maintenance Area. The Air Quality Department explains that the area previously designated by the EPA has exceeded acceptable national standards for CO (carbon monoxide) pollution levels. The EPA re-designated this area in attainment of the national CO standards in 2005, thus declaring the area a maintenance area as opposed to a nonattainment area. Carbon monoxide (CO) is an odorless, colorless gas that forms when the carbon in fuels does not completely burn. Vehicle exhaust contributes roughly 60 percent of all carbon monoxide emissions nationwide, and up to 95 percent in cities. Other sources include fuel combustion in industrial processes and natural sources such as wildfires.

Fire Bans

At times it is necessary to implement a ban on all fires (such as campfires, fire pits, and charcoal grills) throughout the entire park in order to ensure public safety and protect park resources. A typical fire ban may be in effect from May 1 through September 30 each year. A violation of this park rule, Rule 113⁷, may result in a citation and park eviction. Gas and propane use is usually acceptable in designated areas,

³ Maricopa County Air Quality Department, Planning Area Maps,

http://www.maricopa.gov/aq/divisions/planning_analysis/PlanningAreaMaps.aspx as accessed April 9, 2014.

⁴ EPA, Particulate Matter (PM 10) Information, <http://www.epa.gov/airquality/greenbk/pindex.html> as accessed April 9, 2014.

⁵ Volatile organic compounds (VOCs) are [organic chemicals](#) that have a high [vapor pressure](#) at ordinary, [room-temperature](#) conditions. Their high vapor pressure results from a low boiling point, which causes large numbers of molecules to [evaporate](#) or [sublimate](#) from the liquid or solid form of the compound and enter the surrounding air.

⁶ NO_x is a generic term for mono-nitrogen oxides NO and NO₂ ([nitric oxide](#) and [nitrogen dioxide](#)). They are produced from the reaction of [nitrogen](#) and [oxygen](#) gases in the air during [combustion](#), especially at high temperatures. In areas of high motor vehicle traffic, such as in large cities, the amount of nitrogen oxides emitted into the atmosphere as [air pollution](#) can be significant.

⁷ Maricopa County Parks and Recreation, Park Rules, Adopted August 13, 2003 by Maricopa County Board of Supervisors. <http://www.maricopa.gov/parks/PDF/ParkRules.pdf> as accessed May 2, 2012.



except during extreme fire bans. Lifting the fire ban is dependent on regional temperatures and the amount of seasonal monsoon rain the park receives and is announced by the Department.

A burn permit is not needed from Maricopa County's Air Quality Department for the following activities:⁸

- Cooking for immediate human consumption (Regulation III, Rule 314, Section 303.1.a)
- Warmth for human beings (Regulation III, Rule 314, 303.3a, unless under a fire ban)
- Recreational purposes where the burning material is clean, dry wood or charcoal (Regulation III, Rule 314, 303.3b, unless under a fire ban)

However, it should be noted that while a permit may not be needed for these activities, they may be prohibited while under a fire ban.

3.3 Physiography and Climate

This section reviews the physiographic properties of the park and describes typical climatic conditions and other natural surroundings.

3.3.1 Physiography

Estrella Mountain Regional Park is within the Basin and Range province of the Southwest United States. An abrupt change in elevation, alternating between narrow faulted mountain chains and flat arid valleys or basins, is typical here. The development of the province is the result of crustal extension that began in the Early Miocene era. As these geologic blocks tilted, sediments from erosion filled the valleys between them, creating the basins.

As a free-standing mountain range, the Sierra Estrella Mountain range extends approximately 20 miles in a northwest to southeast direction and is about five miles wide. The majority of the mountain range is protected by the park, BLM wilderness area, or the Gila River Indian Community. These razor sharp mountains and rocky canyons offer spectacular views. The mountain range features a handful of peaks over 4,000 feet with Hayes Peak being the highest at 4,512 feet.

The park is within the Sonoran Desert, the dominate feature of Basin and Range. The Sonoran Desert covers about 120,000 square miles of the Southwest United States, extending into Mexico. This desert region is the hottest desert in the United States although winter temperatures can sometimes reach freezing. Winter and summer monsoon storms provide much needed water to the rich and diverse desert life. The winter storms, when they produce enough precipitation, result in an abundant spring flowering season.

3.3.2 Climate

The warmest months are June through August when the average temperature can reach over 100°F and park activity slows down. Cooler months, January through March and November through December, provide visitors with an opportunity to enjoy the scenic beauty without the heat.

⁸ Maricopa County Air Quality Department, Regulation III - Control of Air Contaminants, Rule 314 Open Outdoor Fires and Indoor Fireplaces at Commercial and Institutional Establishments. http://www.maricopa.gov/aq/divisions/planning_analysis/rules/docs/314-1207.pdf as accessed December 26, 2012.



Monsoon thunderstorms are also experienced throughout the Phoenix metropolitan area (due to seasonal wind shifts and daytime heating⁹) generally in the months of July through September and may produce heavy rain or humidity. Occasional wind or dust storms may be experienced as well. On the highest mountain peaks, temperatures can be 8-12 degrees cooler than in the valley. Snow may be seen at least once or twice a year on the highest points of the mountain range, typically above 4,000 feet and occasionally near 2,000 feet.

Annual rainfall is scant and largely limited to the winter and summer seasons (table 3-1). Light winter rains bring forth grasses and forage plants, and green up the cacti and ocotillo; when plentiful, wildflowers are abundant. Summer rain, largely the product of thunderstorms, is frequently torrential. The northern portion of the park occasionally receives enough storm water runoff from the hillsides located south of Casey Abbott Drive South¹⁰ to produce localized flooding.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg High (°F)	65	70	76	85	94	103	105	103	98	87	74	64
Avg Low (°F)	42	45	50	56	64	72	79	79	72	59	48	41
Precip. (Inch)	0.99	1.28	0.97	0.37	0.11	0.04	0.83	1.23	0.95	0.49	0.68	0.99

Source: The Weather Channel, <http://www.weather.com/weather/wxclimatology/monthly/4178:19> as accessed December 30, 2013.

3.4 Water Resources

The water resources section describes surface and groundwater resources within the park. In 1868, George Ingalls, a surveyor for the United States government, described the Gila River as “a fine stream of water about 10 chains (680 feet) wide...has a rapid current generally”. In 1883, R.C. Powers, another government surveyor, described the river as “more than sufficient for irrigation” and in 1910 yet another surveyor, Guy V. Harrington, noted that the river contained water year-round although the flow was dwindling as the water was diverted elsewhere.

The United States Congress established the Bureau of Reclamation in 1902 and by 1903 they had authorized the Roosevelt Dam project on the Salt River. This accelerated growth of the south-central Arizona desert region. The Roosevelt Dam was finished in 1911 and several more dams were built by 1920. However, it was the completion of the Coolidge Dam in 1929 that reduced the Gila River water flow to seasonal flows or after heavy rains, leaving it a dry river bed for much of the year. Today, the El Rio Watercourse Master Plan provides methods to restore water and other riparian functions back to the Gila River while at the same time reducing flood risk.

3.4.1 Surface Water Hydrology

The Gila River passes through the northern-most portion of the park. The basin is drained by two major rivers; the Agua Fria and Gila Rivers. Estrella Mountain Regional Park is within both the Lower Gila-

⁹ ASU, School of Geographical Sciences & Urban Planning, Basics of the Arizona Monsoon & Desert Meteorology, <http://geoplan.asu.edu/aztc/monsoon.html> as accessed April 3, 2012.

¹⁰ MCDOT, et. al., Estrella Mountain Regional Park Master Plan Access Roads (September 2015), Pages 6-8.



Painted Rock Reservoir (HUC 15070101) and the Middle Gila (HUC 15050100)¹¹ hydrologic units and subsections of the Phoenix Active Management Area for groundwater.

Throughout the remainder of the park, there are no perennial or intermittent streams but there are a number of natural, ephemeral and mostly unnamed washes throughout the park and three major watersheds that distribute storm water runoff (figure 3-4; table 3-2).

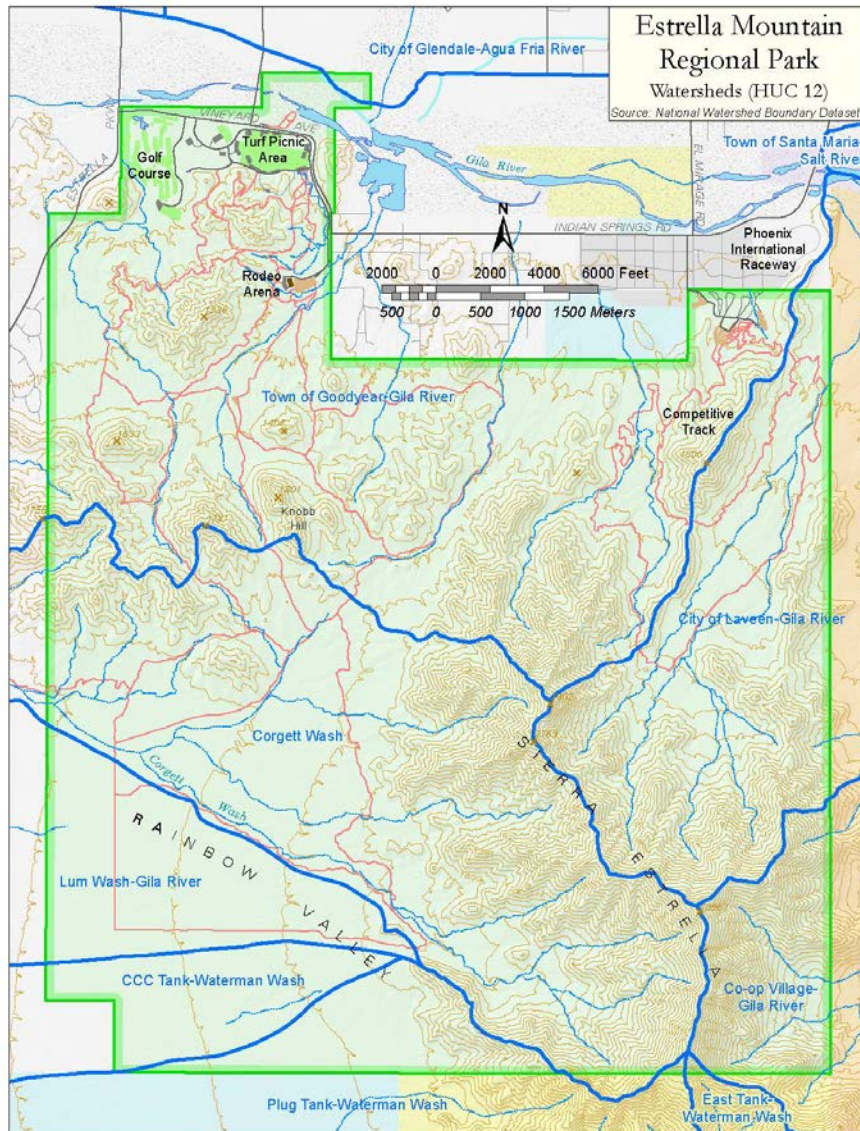


Figure 3-4: Major washes (light blue lines)¹²

¹¹ EPA, MyWATERS Mapper.

http://watersgeo.epa.gov/mwm/?layer=LEGACY_WBD&feature=15070102&extraLayers=null

¹² National Watershed Boundary Dataset (WBD), obtained January 2011. For more information on the WBD, see <http://www.ncgc.nrcs.usda.gov/products/datasets/watershed/index.html>



Location of Wash at Park Boundary	Drainage Area Within Park in Square Miles
Section 32, T1N-R1W	1.9
Section 4, T1S-R1W	2.2
Section 10, T1S-R1W	1.8
Section 11, T1S-R1W	2.1
Section 1, T1S-R1W	0.6
Section 12, T1S-R1W	3.7
Section 19, T1S-R1W (Corgett Wash)	9.0

Source: Maricopa County Regional Park System Plan, Volume 2, page 39, 1965.

The park’s northern and more developed areas fall within a regulatory floodway and floodplain of the Gila River. It is important to note that at the time of this writing, these designated flood areas are being reevaluated and altered by FEMA and the Maricopa County Flood Control District; the Department and park staff should continue to monitor these changes for any impacts to the park. A current map (figure 3-5) is shown below; however any updated maps should be inserted into Appendix C.

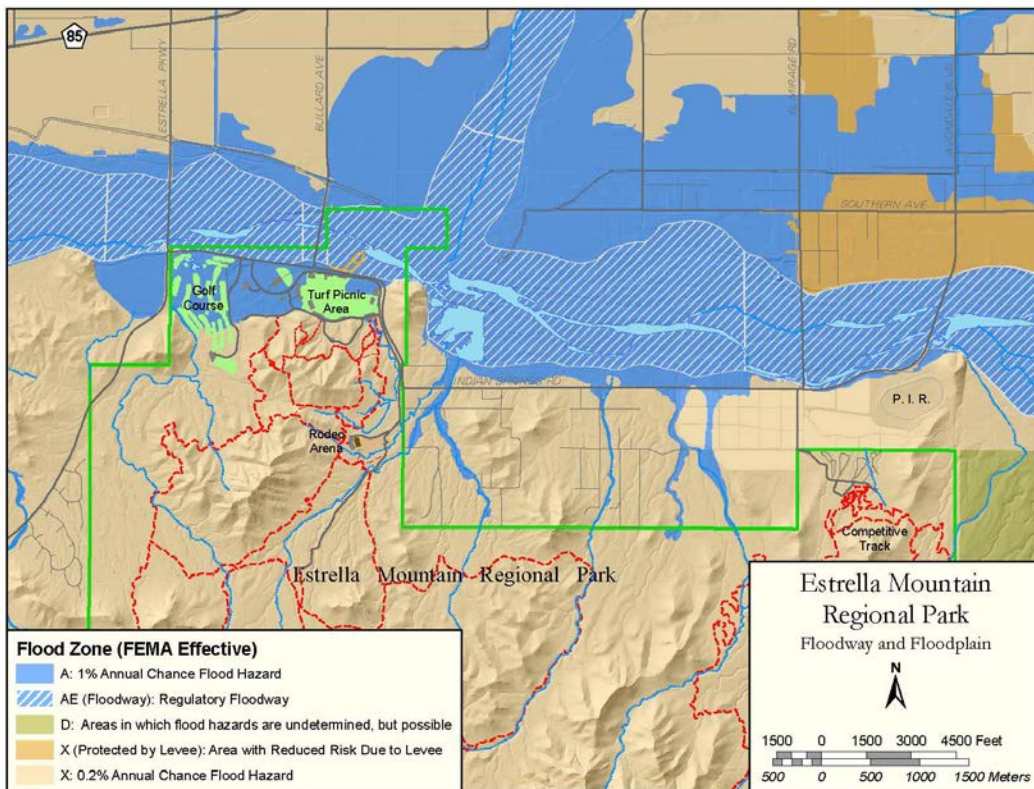


Figure 3-5: Floodway and Floodplain

The Maricopa County Flood Control District monitors precipitation and provides flood alerts through the following monitoring stations (table 3-3):



Station ID	Station Name	Station Type	Install Date
6850	Gila @ Estrella Pkwy.	Precip.	2/28/1989
6853	Gila @ Estrella Pkwy.	Stream PT	3/1/1993

3.4.2 Groundwater Resources

As does most of Maricopa County, Estrella Mountain Regional Park resides in the Phoenix Active Management Area (AMA)¹³ groundwater basin; these are areas that rely heavily on mined groundwater and require additional withdrawal rate management. There are five registered wells at the park; however, only one is active.

3.5 Earth Resources

The park is located within the Basin and Range Province of the Desert Southwest, as is much of Arizona. Basin and Range is a result of tectonic forces and volcanism over millions of years.¹⁴ The Sierra Estrella Mountains are an elevated, tilted fault block and oriented in a northwest to southeast direction. Elevations vary from about 900 to over 4,000 feet.

3.5.1 Geology

The rock types found are mostly schist and granite with some areas of gneiss and Laramide granite (figure 3-6). For a full list of types and detailed description of locations of occurrence, as compiled by Arizona Geological Survey¹⁵ Map Services, see Appendix D.

¹³ Arizona Department of Water Resources, <http://www.azwater.gov/> as accessed September 26, 2012.

¹⁴ The Geologic Origin of the Sonoran Desert, Robert Scarborough
http://www.desertmuseum.org/books/nhsd_geologic_origin.php as accessed April 30, 2014.

¹⁵ The Arizona Geological Survey, AZGS Map Services Geologic Map of Arizona,
http://www.azgs.gov/services_azgeomap.shtml as accessed July 17, 2014.

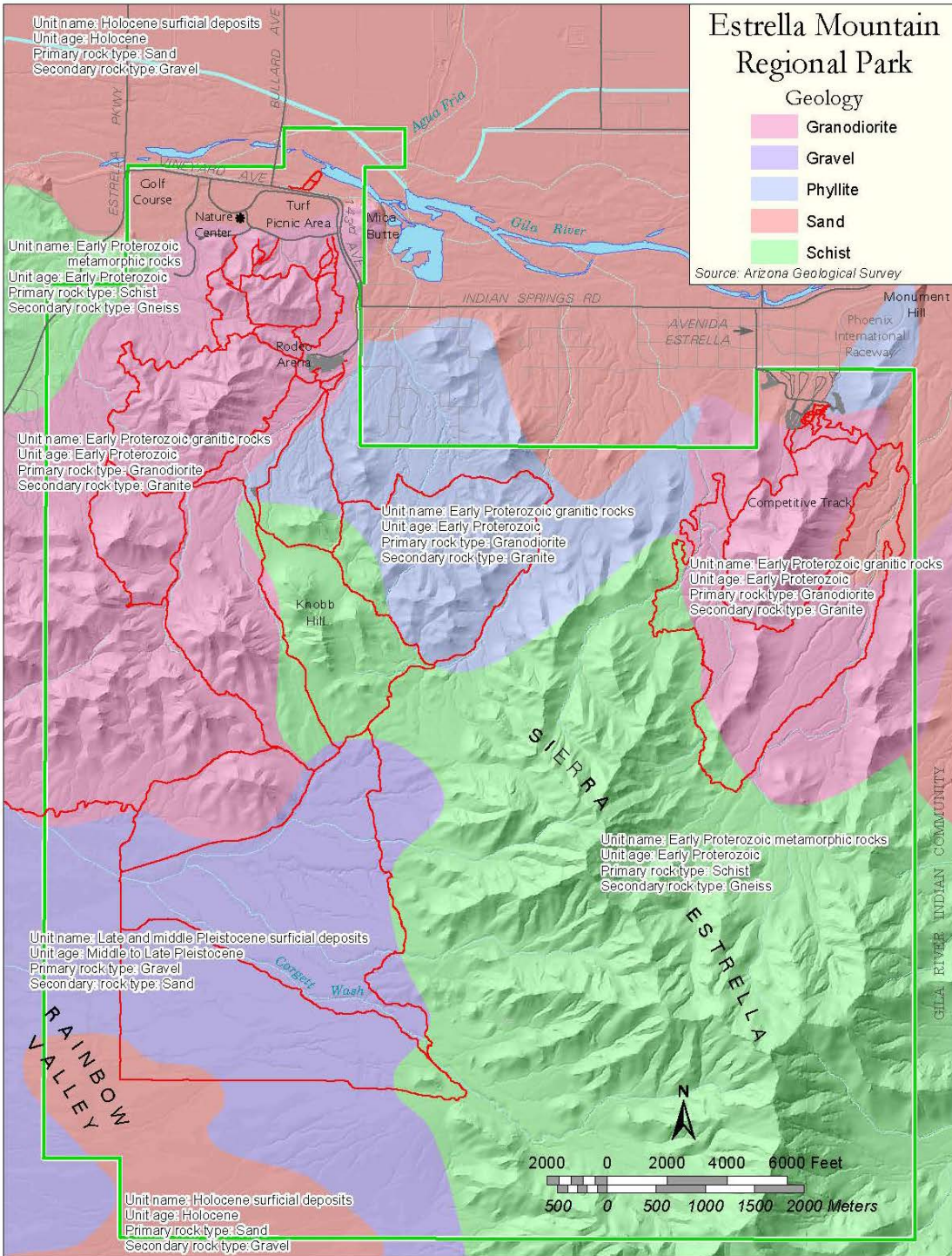


Figure 3-6: Geology



3.5.2 Land Subsidence and Earth Fissures

Arizona Department of Water Resources (ADWR) is the state agency responsible for identifying and monitoring active land subsidence areas around the state. There are no known land subsidence areas in or near the park.¹⁶

Effective September 21, 2006, Arizona Revised Statute § 27-152.01(3) requires the Arizona Geological Survey (AZGS) to complete comprehensive mapping of earth fissures throughout Arizona and providing earth fissure map data to the State Land Department to be made available online with other GIS map layers for the public to use in building their own customized maps. Parts of Maricopa County were mapped¹⁷ and no fissures are currently known within the park itself.

3.5.3 Soils¹⁸ and Erosion Potential

The major soil types found in the park are fine sandy loam and gravelly loam in the development management zones and rock outcrop in the primitive management zone areas (figure 3-7). The soils immediately surrounding the Sierra Estrella Mountains have a low to moderate shrink/swell potential.¹⁹ See Appendix D for a soils map and definitions.

Due to the steep and rugged slope (15% or greater) of the mountains, erosion potential is high in these areas, resulting in talus and alluvium deposits below (and is what slowly fills the “basins” within a Basin and Range system). During an extreme flash flood event, these materials can be transported to lower lying areas below.

¹⁶ Arizona Department of Water Resources, Hydrology Division, Arizona Land Subsidence Areas and Interactive Map, <http://www.azwater.gov/AzDWR/Hydrology/Geophysics/LandSubsidenceInArizona.htm> as accessed April 30, 2014.

¹⁷ The Arizona Geological Survey, Arizona’s Earth Fissure Center, <http://www.azgs.az.gov/efv.shtml> as accessed April 30, 2014.

¹⁸ USDA Natural Resources Conservation Service, Soils website, <http://websoilsurvey.nrcs.usda.gov/app/> as accessed July 17, 2014.

¹⁹ USDA, Natural Resources Conservation Service, Soil Properties Shrink/Swell Potential, http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/az/soils/?cid=nrcs144p2_065083 as accessed July 17, 2014.

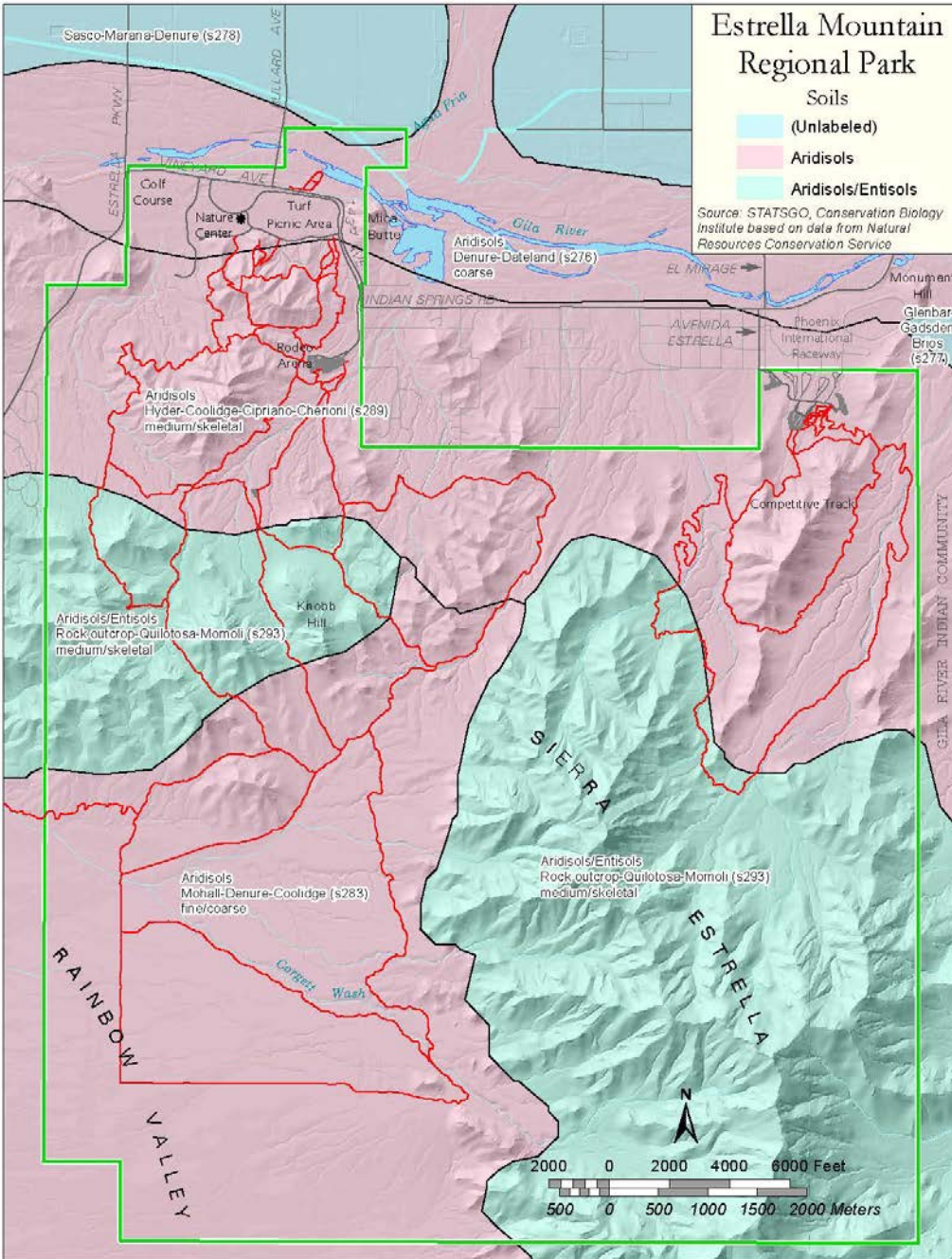


Figure 3-7: Soils

3.6 Biological Resources

The State of Arizona has over 900 animal species and a diversity of landscapes. Maricopa County is located in the central portion of the Sonoran Desert and is home to a variety of plants and animals. The wildlife and vegetation commonly seen in the park is typical of a Sonoran Desertscrub environment.

Fire is not historically common to a Sonoran Desertscrub environment, although with intrusion of human influence and adjacent development, it is more of a risk today. Tamarisk (salt cedar) fires are a



problem in the river bed at adjacent locations. Historic cattle activity brought more grasses into the area (as did homes) and these grasses can also serve as fuel to fires.

The Arizona Upland Subdivision vegetation occurs on slopes and broken ground (green areas on figure 3-8) while desert pavement is typical of the Lower Colorado River Subdivision (red areas on figure 3-8); high temperatures and little precipitation are common elements to each.

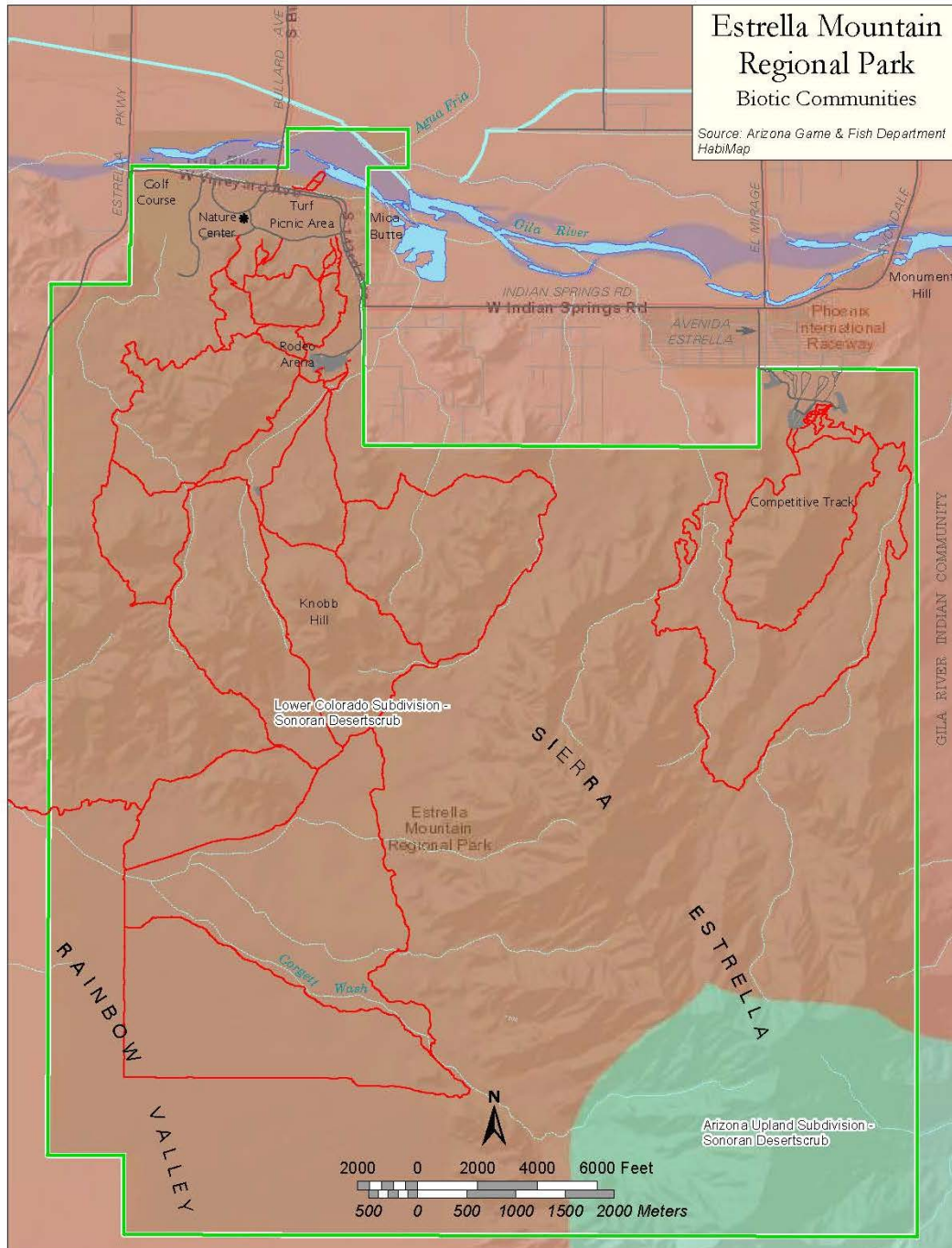


Figure 3-8: Biotic Communities (Source: Arizona Game and Fish Department, HabiMap™)



3.6.1 Wildlife

The Gila River riparian area also provides habitat for mud turtles, salamanders, coral snakes, tilapia, blue gills, catfish, carp, crayfish and zooplankton, and other aquatic wildlife.

Common Reptiles and Amphibians

Examples of species adapted to the bajadas, or rocky and steep terrain, and/or brushier vegetation include the desert tortoise (*Gopherus agassizii*, Sonoran Population) and Gila monster (*Heloderma suspectum*). The Western Diamondback rattlesnake is also common to the park.

Some species spend a majority of their time underground emerging either to feed or breed such as the Gila monster. Several subspecies of the whiptail lizard may be found inside the park. Whiptail lizards are diurnal and are most often seen in the day time foraging for food and do not spend as much time underground as the Gila monster.

Common Birds

Within the HabiMap™ online planning tool, the Arizona Breeding Bird Atlas query identifies reproductively active birds that occur or have the potential to occur within park boundaries. There are many resident species that inhabit the park such as: roadrunner, cliff swallow, burrowing owl, red-tailed hawk, American kestrel, cactus wren, Abert's towhee, and Say's Phoebe are also common to the park. The riparian corridor, also considered an Important Bird Area (IBA), at the north boundary of the park supports a variety of migratory birds as well (figure 3-9).

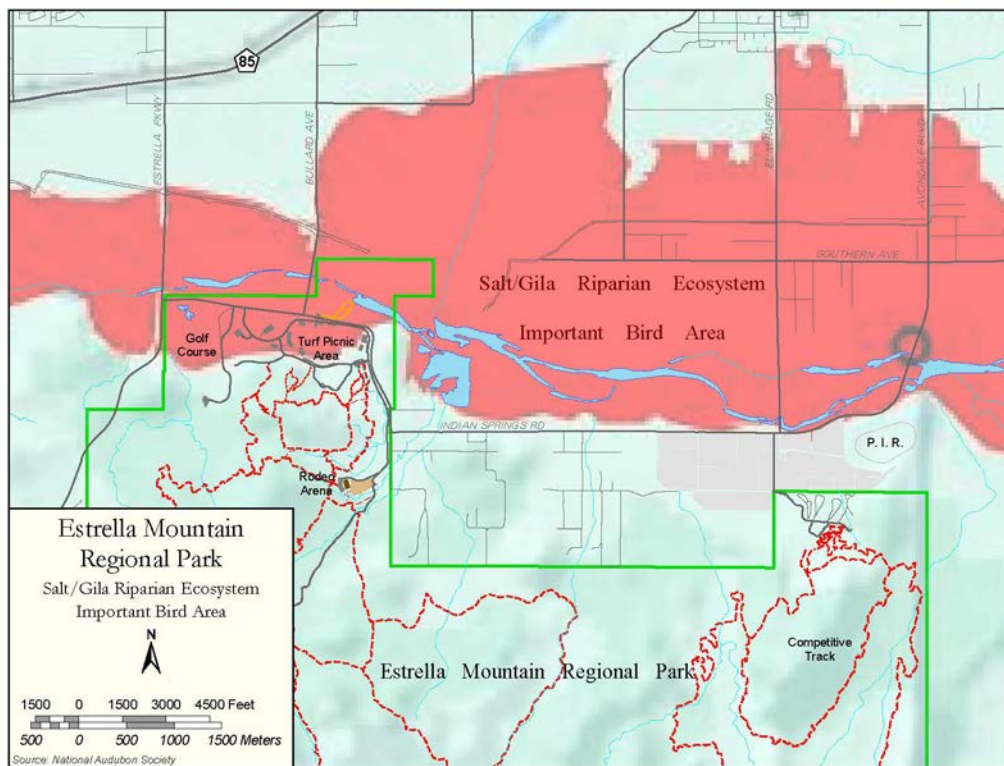


Figure 3-9: Arizona Important Bird Areas (Source: [National Audubon Society](#))



Common Mammals

The park is home to many types of animals typical of the desert environment. Most commonly seen are coyote, javelina, bobcat, Mule deer, kangaroo rat, raccoon, Harris' antelope ground squirrel, rock squirrel, round-tailed ground squirrel, desert cottontail, black-tailed jackrabbit, and several bat species.

While not rare species, beaver are occasionally found in the riparian areas. Similarly, mountain lion and a remnant herd of desert bighorn sheep might be seen in the more mountainous areas of the park.

3.6.2 Special Status Wildlife

The Federal Register (Register) currently has 50 federally Threatened or Endangered²⁰ animal species listed under the Endangered Species Act within the State of Arizona. The Register is updated daily and species may be added or dropped and should be checked regularly to ensure compliance. See Appendix E for a listing of these animals that occur within Maricopa County. Of those listed, the following may be found in the park or habitat that supports the species may be present in the park:

- Southwestern willow flycatcher (*Empidonax traillii extimus*) (Endangered)
- Yuma Clapper Rail (*Rallus Longirostris Yumaensis*) (Endangered)

3.6.3 Natural Heritage Program – Heritage Data Management System (HDMS)

Additionally, AZGFD tracks animals of State concern through its Natural Heritage Program.²¹ Of those listed, the following may be found within the park or habitat may exist to support the species:

- Western burrowing owl (*Athene cunicularia hypugaea*)
- Sonoran collared lizard (*Crotaphytus nebrius*)
- California leaf-nosed bat (*Macrotus californicus*)
- Yuma Clapper Rail (*Rallus Longirostris Yumaensis*)
- Bat colony (not specified)

3.6.4 Species of Greatest Conservation Need (SGCN)²²

The State of Arizona has identified certain species with a great need for conservation actions in its Wildlife Action Plan (SWAP) and those are indicative of the diversity and health of the State's wildlife. The list includes species that are currently listed as threatened or endangered under the Endangered Species Act (ESA) as well as many others with significant vulnerability such as low and declining populations. Overall, it is AZGFD's intent to highlight the needs of these species, as well as Special Status Species, in an effort to "keep common species common" and maintain as much of Arizona's biodiversity as possible in light of development pressures and habitat loss. These species within the park planning area include: Abert's towhee (*Melospiza aberti*), Desert bighorn sheep (*Ovis canadensis mexicana*), Arizona myotis (*Myotis occultus*), Arizona pocket mouse (*Perognathus amplus*), bald eagle (*Haliaeetus leucocephalus*), California leaf-nosed bat (*Macrotus californicus*), Gila monster (*Heloderma suspectum*), Gila woodpecker (*Melanerpes uropygialis*), Sonoran desert tortoise (*Gopherus agassizii*, Sonoran Population), Western burrowing owl (*Athene cunicularia hypugaea*), or others.

²⁰ U.S. Fish and Wildlife Service, Species Report, http://ecos.fws.gov/tess_public/pub/stateListingIndividual.jsp?state=AZ&status=listed as accessed July 28, 2014.

²¹ Arizona Game and Fish Department, Natural Heritage Program, http://www.azgfd.gov/w_c/edits/species_concern.shtml and HabiMap™ HDMS query <http://habimap.org/habimap/> as accessed July 28, 2014.

²² Arizona Game and Fish Department, HabiMap™ SGCN query, <http://habimap.org/habimap/> as accessed July 28, 2014.



3.6.5 Other Types of Animals

Occasionally, park staff finds other types of animals within the park; usually domestic pets that have been abandoned or lost inside the park. When discovered, these animals are turned over to the appropriate agency for their care and potential re-homing. These animals include: dogs, turtles, and lizards.

3.6.6 Wildlife Linkages²³

The Sierra Estrella Mountain range is considered to be part of a wildland block; meaning it is part of a large contiguous natural area capable of supporting a diverse array of wildlife into the foreseeable future. Currently, these mountains are connected to undeveloped mountainous terrain to the east and south; with very few roads, urbanization, or other barriers. While there are no designated critical wildlife linkage zones (or corridors) within park boundaries, it provides an important refuge for wildlife. Likewise, the riparian corridor along the Gila River is considered a potential linkage zone across habitat as well as an IBA (figure 3-10).

²³ Arizona Game and Fish Department. Wildlife and Habitat Connectivity, http://www.azgfd.gov/w_c/connectivity.shtml as accessed December 31, 2012 and in-person meeting December 20, 2012 with Dana Warnecke, Habitat Specialist III, Arizona Game and Fish Department and follow-up consultation.

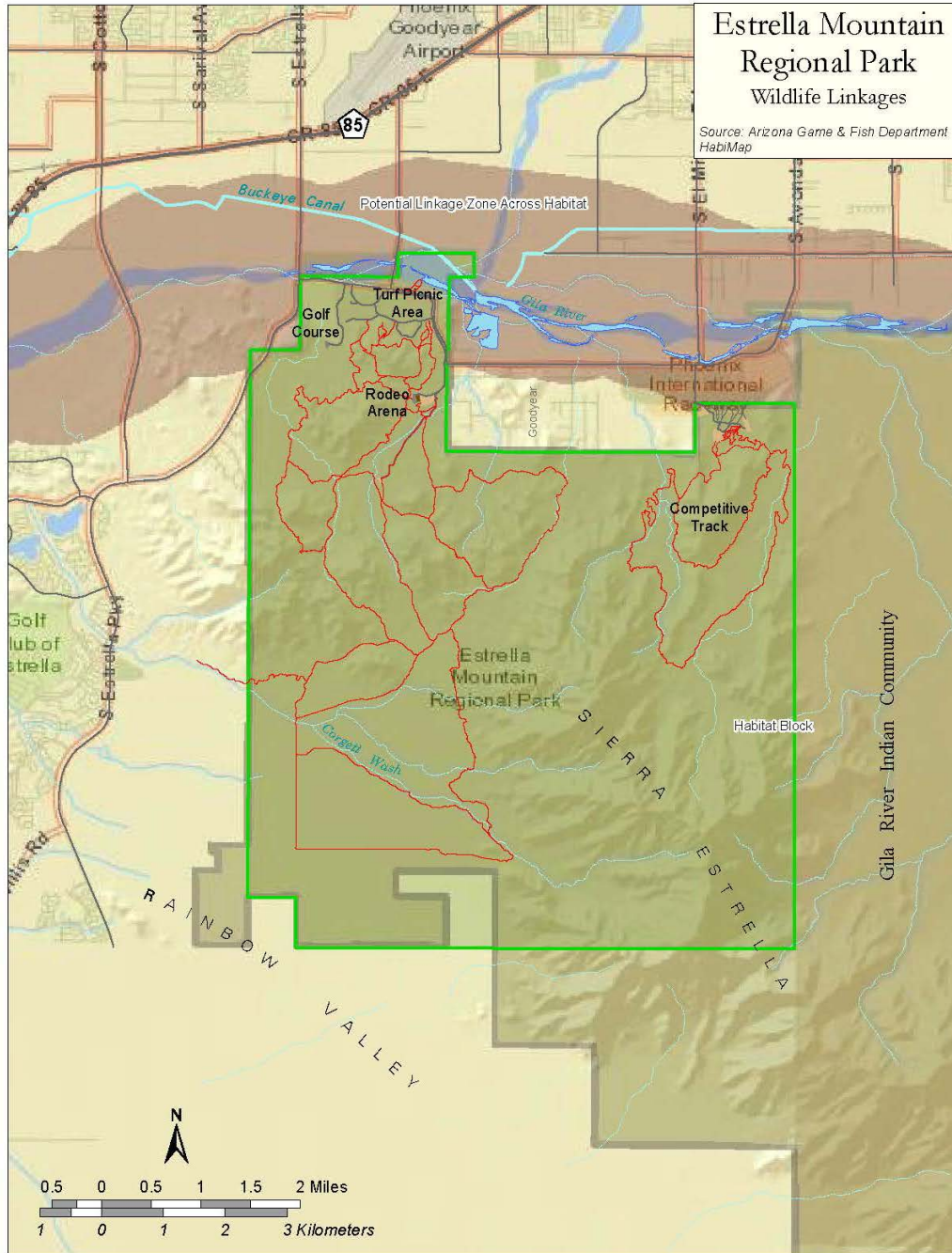


Figure 3-10: Wildlife Linkages, HabiMap™ (Source: Arizona Game and Fish Department)

The City of Goodyear’s [General Plan 2025](#) (page 132) recognizes a wildlife linkage overlay to support wildlife movement between the Sonoran Desert National Monument and the Sierra Estrella Mountains and designates the area for open space preservation.



3.6.7 Vegetation

A flora inventory completed in 1974²⁴ showed 315 species and variations occurring within the park; the inventory and a searchable database are available on the [Southwest Environmental Information Network](#) website. The following native plants are commonly seen in the park: sage, ocotillo, Saguaro cactus, four-wing salt bush, burro bush, creosote bush, brittle bush, pincushion cactus, stag horn cholla, teddy-bear cholla cactus, as well as desert trees such as ironwood, palo verde, and mesquite.

Noxious Weeds and Plants

Disturbed areas within the park, especially near campsites, parking lots, and along trails are ripe ground for noxious weeds to take root. The most common noxious weed within the park is red brome. Tamarisk (salt cedar) is also pervasive within the park and efforts have been made to eliminate this species. See Appendix E for description of these plants.

3.6.8 Special Status Vegetation

The Federal Register currently has 20 federally Threatened or Endangered²⁵ plant species listed under the Endangered Species Act within the State of Arizona. The Register is updated daily and species may be added or dropped. Currently there are no known federally threatened or endangered plant species within the park. However, the park should review this list periodically for new species that may occur inside the park.

Additionally, AZGFD tracks over 130 plants of state concern through its Natural Heritage Program.²⁶ See Appendix E for a listing of these plants that occur within Maricopa County and how other agencies rank them. Of those listed, the following may be found within the park or conditions exist that may support:

- Lobed fleabane (*Erigeron lobatus*)
- Desert spike moss (*Selaginella eremophila*)

3.7 Cultural Resources and Native American Consultation

This section offers a brief history of the park and surrounding area, but by all means, is not a complete historical record. The historical names and/or events mentioned in this section may bring context to park-related naming conventions. While a comprehensive archeological inventory has not been completed on the entire park, project or site specific surveys have been completed and a number of records are available. These inventories are kept on file at the park or Department offices and may not be available to the general public in order to protect sensitive archaeological sites.

Multiple sections of the 1988 master plan served as the primary source for much of the historical information contained in this section and may be consulted for additional detail (Estrella Mountain Regional Park Long-range Master Plan, 1988, BRW, Inc.). Appendix F contains additional cultural resource information.

²⁴ Sundell, E. G. 1974. Vegetation and flora of Sierra Estrella Mountains Regional Park, Maricopa County, Arizona. M. S. thesis, Arizona State University, Tempe. SEINet, <http://swbiodiversity.org/seinet/checklists/checklist.php?cl=7&pid=1> as accessed May 2, 2014.

²⁵ U.S. Fish and Wildlife Service, Species Report, http://ecos.fws.gov/tess_public/pub/stateListingIndividual.jsp?state=AZ&status=listed as accessed July 28, 2014.

²⁶ Arizona Game and Fish Department, Natural Heritage Program, http://www.azgfd.gov/w_c/edits/species_concern.shtml and HabiMap™ HDMS query <http://habimap.org/habimap/> as accessed July 28, 2014.



3.7.1 Pre-History of Area²⁷

Cultural remains may be encountered throughout the park that may represent the remnants of the prehistoric archaeological culture called Hohokam. However, because of the complex geomorphological conditions in the park, it is possible for discoveries dating to the earlier Paleoindian and Archaic cultures to be found. Further, the park is adjacent to the Gila River Indian Community consequently evidence of Akimel O’odham (Pima) and/or Piipaash (Maricopa) use of the area may also be present.

Water was a critical element to those who lived in this desert region. Unsurprisingly, the Hohokam relied heavily on irrigation for its farms in order to produce food and trade goods. Traces of irrigation canals have been found along the Salt and Gila Rivers and evidence of which have been located within the park but not confirmed. Around A.D. 1450, these agricultural centers were abandoned for unknown reasons.

Petroglyphs (figure 3-11) are found in many places throughout the park. Petroglyphs are renderings left behind on rock by ancient peoples. The rocks are covered by a paper-thin coating of dark “desert varnish” or patina²⁸ on exposed rocks and boulders. This varnish is what allowed native peoples to leave their petroglyph messages behind. The park interpretive ranger occasionally leads educational hikes to some petroglyphs located closer to the Nature Center and front-country areas. Others locations may be monitored by the Arizona Site Steward program.



Figure 3-11: Petroglyphs

3.7.2 History of Area²⁹

Up to 1821, when Mexico broke from Spain, the native people occasionally encountered Roman Catholic missionaries who converted the local people and introduced new crops and technologies but were largely left alone. The Treaty of Guadalupe Hidalgo was signed in 1848, ending the war with Mexico. With this treaty, all lands north of the Gila River were part of the United States territory and all lands south of the river remained with Mexico. Later, through the Gadsden Purchase (1853-1854), the border between the United States and Mexico was moved south to its present day location, placing Estrella Mountain Regional Park within the New Mexico territory of the United States.

In 1861, as the nation was embroiled in the Civil War, Colonel John R. Baylor of Texas took official possession of the “territory of Arizona” for the Confederacy – an area that included all of present day Arizona south of the 34th parallel. This action put the park under the Confederate flag by signature of then Confederate President Jefferson Davis in 1862. In 1863, President Abraham Lincoln signed a bill creating the new Territory of Arizona; the legislation remained law at the end of the war and effectively divided the New Mexico and Arizona territories at their current boundaries.

Beginning in the 1850’s through the 1860s, the lands around the park experienced an increase in travel via newly formed stage lines, mail routes, and other overland trails. In 1857, the San Antonio and San

²⁷ Estrella Mountain Regional Park Long-range Master Plan, 1988, BRW, Inc.

²⁸ Desert Soils, Joseph R. McAuliffe, http://www.desertmuseum.org/books/nhsd_desert_soils.php as accessed April 18, 2012.

²⁹ Estrella Mountain Regional Park Long-range Master Plan, 1988, BRW, Inc.



Diego Mail line began operation south of the park. The Butterfield Overland Mail stage line also operated through this area from 1858 to 1861 followed by the Arizona Stage Company (and others) during the 1860s through 1870s.

Gold was discovered near the Town of Wickenburg in 1863 and travel increased along the Southern Overland Trail (following the old Gila Trail) before branching off towards Wickenburg and Prescott. The prospect of striking it rich in gold continued to attract people to the mountains of Central Arizona, and although a number of mining claims were filed nearby, as well as within park boundaries, nothing of consequence was found in or near the park. Test pits can still be found inside the park.

Around this time, the United States government created the reservation system for Native Americans. The first one established was the Gila River Indian Reservation (64,000 acres) in 1859 – east and south of Estrella Mountain Regional Park. By 1869, the Reservation was increased to 145,000 acres. The 1860s and 1870s brought additional pressures (e.g. severe water shortages and other agricultural pressures) to the Reservation for several decades that caused many to flee to areas with better water access. Some portions were later allowed to be developed by non-native peoples, per order of the Secretary of the Interior in 1911.

Homesteading, Ranching and Herding

Homesteaders and ranchers began staking claim to the lands inside the park boundary as early as 1889. Official GLO plats of 1914 and 1917 show a frame house at one site and another property owned by James H. Kennedy, although the remnants of these structures no longer exist. Between 1900 and 1930 one homestead and six land lease claims appear in BLM or Arizona State Land Department records. However, water claims were filed as early as the 1870s along with proposals from individuals or companies to divert water from the Gila River for livestock and irrigation. The Coolidge Dam construction in 1929 put an end to this by effectively ending water flow in the river. Similarly, plans to use runoff from the mountains to irrigate the flatter southwest quadrant of the park did not pan out.

During the 1920s, 14 homestead claims and six land lease claims were filed in the park but all were eventually cancelled or transferred after tenants failed to make necessary improvements. Up to 24 homesteads had been filed between 1889 and 1950. After 1940, all homestead claims, land leases, and mining claims were transferred or bought by Maricopa County for inclusion into the park. One of the last private landowners was “Hassayampa” Clyde Pedersen, whose father, Hans Pedersen, homesteaded and improved 160 acres in the southwest corner of the park. The property was finally sold to the County in the mid-1970s. Remnants of the Pedersen residence, outbuildings, and mining activity are still visible today and the family is the namesake for the Pedersen Trail.

The dry, mountainous nature of the park provided little range land. In fact, the State Land Department determined the carrying capacity was three cows or fewer per section. Only one grazing operation was known to use these lands. In 1886, brothers William R. and John Beloit out of Buckeye grazed a small herd on the Gila River near Liberty under the “SL” brand. While park lands were not successfully used for either farming or grazing, lands adjacent to the park have been under cultivation for centuries by ancient people to modern farmers alike.

Mining Claims and Mineral Rights

The Sierra Estrella Mountain Range lured prospectors in search of mineral wealth, but much like grazing, did not produce anything of significance. Legend and lore suggest lost mines or other treasure troves are



yet to be rediscovered in the natural caves or rocky peaks, it is simply one of many miners' tall-tales that abounds in the Southwest. As the 1988 master plan suggests, geologists give no credence to mineral wealth in this area and, likewise, archaeologist testimony does not support metalworking by native peoples living nearby.

Records of the 1940s show a few oil and mineral leases on former State Lands, but these soon proved fruitless and were not renewed. The Buckeye Placer, the only patented mine in the area, patented by the Wessex Water Company in 1915, also proved to be void of minerals or gemstones. Test pits and other evidence of mining may still be seen in the park and along trails to this day.

3.7.3 Native American Consultations

Planning staff sought input from potentially interested Native American communities regarding this master plan update. The Gila River Indian Community (GRIC) shares a boundary with the park and was invited to the January 2016 public meeting. No feedback had been received at the time of publishing this plan.

Likewise, during future master plan updates consultation with representatives of Native American Communities claiming cultural affiliation to the area should be coordinated through Department planning staff in order for the Community to assist in assessing the cultural significance of or actions needed to protect any significant resources.

3.7.4 Findings

A cultural resource records review was initiated to document the extent of previous archaeological survey within the park and the number of previously recorded archaeological and historical sites that have been identified by those surveys. These studies were undertaken in support of a variety of projects such as hiking trail construction, campgrounds, and even roadwork near the park. The surveys performed inside park boundaries aggregate to more than 189 acres, or about one percent of the park's total 19,840 acres. No new field surveys were undertaken for this plan update. No sites have been listed as National Register of Historic Places except for Pack Saddle Trail (SHPO site file 1197) - a historic trail that was used by pioneers traveling from Phoenix to Little Rainbow Valley.

Previous research, and also noted in the 1988 master plan, from areas near or inside the park includes a map of irrigation canals (O. Turney and G. Kelly, State Historian, 1929); numerous Hohokam and historic Native American settlements (as reported by F. Midvale, Fowler, the Gila Pueblo (private archaeological consulting firm), the Museum of Northern Arizona, the Pueblo Grande Museum, and others). The most comprehensive report to date is based on a 1963 survey of five Maricopa County Parks, in which, a dozen sites were authenticated or further verified by the author and former Park Ranger Jim Jenkins (An Appraisal of the Archaeological Resources of Five Regional Parks in Maricopa County, Arizona. Alfred E. Johnson with Emil Hauray, Director of Arizona State Museum, 1963.).

A cultural resource management program should be established to track and monitor known sites. A full cultural resource survey or investigation and State Historic Preservation Office (SHPO) consultation is recommended prior to any new construction or trail project on previously undisturbed ground.

3.8 Visual Resources

Important views for public enjoyment, trail development and vegetation management are identified in this section. Management actions to classify and retain selected views from key observation viewpoints



should be taken into consideration with any new development within the park. The park follows general guidance provided by the Department's mission statement, and management zoning definitions to protect its scenic views.

3.8.1 Sensitive Views

Residential Views

The park shares its boundary with a number of residential homes. Planned communities are expected to occur at a future date along the west side of the park. These neighbors will have excellent views of the Sierra Estrella Mountains.

Recreation Views

The park's trail system includes several prominent spots where visitors are likely to stop and admire the view. Providing unobstructed natural views are important to the recreational experience. These include:

- Viewpoint (accessed via Baseline Trail)
- Baseline Trail
- Rainbow Valley Trail, with its views to the west

Transportation Views

The roadways near the park provide travelers will excellent views of the golf course and ball fields along Vineyard Avenue and from the Bullard Avenue Bridge; golf course and mountainous open space views along Estrella Parkway; and mountainous views along 143rd Avenue and along Indian Springs Road.

3.9 Recreation Resources

One unique feature of the park is the open space sports fields. These fields offer the opportunity for baseball, cross-country running, obstacle runs, or other active uses. Further, as a result of the abundant natural and cultural resources, the park offers visitors a number of more passive recreational and educational opportunities:

- Picnicking
- Trails (hiking, equestrian, mountain bike)
- Playgrounds
- Wildlife viewing
- Nature photography
- Hunting

3.9.1 Off-Highway Vehicles (OHV)

OHV use is not an approved recreational activity within the park or on its trails and therefore is not detailed further in this plan. As of the date of publication of this plan, OHV use within park boundaries may violate park rule R-107 regarding motor vehicle and bicycle use. However, OHV use may be permitted by Department staff for park maintenance or by authorized first responders for emergency search and rescue purposes.

3.9.2 Interpretation and Environmental Education

Interpretive rangers at the park lead hundreds of visitors on a variety of educational hikes and programs throughout the year and incorporate the local history and nature components to tell the story of the park. The park provides other events and programs such as:



- Guided nature hikes
- Guided fitness walks
- Youth-oriented events, and
- Star gazing

Additionally, the park has a fairly large hillside amphitheater where interpretive rangers can present educational lectures or special-event hosts can perform for up to 300 people. The El Rio Plant Research Trail provides another educational experience with interpretive panels along the quarter-mile trail describing native riparian vegetation. The proposed Centennial Trail will also provide educational opportunities by showcasing local history and native plant life along a half-mile looped and barrier-free trail.

3.9.3 Hunting

The park allows hunting of mule deer, javelina, mountain lion, some small game, reptiles, and amphibians during specified hunting seasons and as regulated by AZGFD. The park currently falls within Region 6, Game Unit 39 on the AZGFD Game Management Unit Map.

A valid hunting license is required and each hunter should state his/her intention to hunt at the park entrance station or with the Park Supervisor (or his/her designee) and pay any applicable park fees. All hunters must comply with the most current version of Arizona Revised Statutes, Arizona Game and Fish Commission rules and regulations, and Park rules.

It is illegal and a revocable offense to shoot a firearm or bow and arrow within a quarter of a mile of any developed picnic area, developed campground, shooting range, occupied building, boat ramp, or golf course or other recreational area developed for public use; or to shoot from, on, or across a roadway; or to trespass on private property. A trail is not considered a developed area.

Participation

Hunting is not a large recreational component of the park. The 2012-2013 ASU Park Visitor Study (as well as previous studies) reported no visitors engaged in hunting during the survey period. The Visitor Study did not record any hunters during this time and no hunters checked in with the park office.

When surveyed during the 2007-2008 Visitor Study, less than ten percent of Estrella's respondents agreed that hunting was an appropriate activity with the County's park system. This question was not asked in the 2012-2013 visitor study.

Illegal hunting activities do occur in the riparian areas and near Mica Butte. When this happens, park staff is forced to alter its operations and programs so to avoid any conflicts or harm. These areas are monitored by law enforcement for illegal activities.

Species of Economic and Recreational Importance (SERI)

This category, developed by AZGFD, represents the economic and recreational importance of 13 of Arizona's huntable species. The distribution of these species influences important aspects of wildlife-related recreation and the distribution of consumer spending across the state. Together, the economic and recreational importance of game species to hunters, the community, and to AZGFD provide a realistic view of the importance of game habitat for conservation (excerpt from [Arizona's State Wildlife](#))



[Action Plan 2012–2022 \(May 16, 2013\)](#), page 44). For the park, species of economic and recreational importance include:

- Desert bighorn sheep (remnant herd)
- Gambel's quail
- Mountain lion
- Mule deer
- White-winged dove

Statewide, anglers and hunters spend \$958 million, creating an economic impact of \$1.34 billion to the state of Arizona. This spending supports over 17,000 jobs, provides residents with \$314 million in salary and wages and generates more than \$58 million in state tax revenue.³⁰

According to AZGFD, fishing and hunting within Maricopa County accounts for \$409.1 million (or 43% of the statewide total) in expenditures (or \$515 million using an economic impact multiplier effect). Salary and wages of the 5,382 outdoor industry professionals is about \$103 million and provides \$21.1 million in state tax revenue.³¹

3.10 Land Use

3.10.1 Ownership & Jurisdiction

Ownership

Just over 500 acres of land was acquired through the State Land Department in 1976. However, the bulk of the property was acquired through the Recreation and Public Purposes Act³² (R&PP) process in the 1960s and 1970s. The R&PP is administered by the Bureau of Land Management (BLM) and authorizes the sale or lease of public lands for recreational or public purposes. All land uses must comply with the R&PP Act³³ and the patents as issued. The County owns several parcels in fee title. The park has not acquired any additional lands since 2002. Appendix G details land use. The Department holds these areas as patents or in fee title (table 3-4; figure 3-12):

³⁰ Arizona Game and Fish Department, Economic Impact, http://www.azgfd.gov/w_c/survey_results.shtml as accessed December 24, 2012.

³¹ Arizona Game and Fish Department, The Economic Importance of Fishing and Hunting, http://www.azgfd.gov/pdfs/w_c/FISHING_HUNTING%20Report.pdf, page 30-31, as accessed December 24, 2012.

³² As revised August 1996. Recreation and Public Purposes Act (68 Statute 173; 43 United States Code 869 et. seq.) as a complete revision of the Recreation Act of 1926 (44 Stat. 741). This law is administered by the Bureau of Land Management (BLM).

³³ BLM, Recreation and Public Purposes Act, http://www.blm.gov/wo/st/en/prog/more/lands/recreation_and_public.html as accessed February 28, 2013.



Type	Date	Acres
Federal Patent (02-66-0070)	Jan-1966	640.00
Federal Patent (02-72-0037)	Dec-1971	17,124.504
Federal Patent (02-76-0037)	Jul-1977	80.00
State of AZ (6352)	1976	40.00
State of AZ (6353)	1976	450.803
Fee Title/Warranty Deed	<i>various</i>	1,459.553
Other	<i>various</i>	2.646
Total park acres:		19,795.66

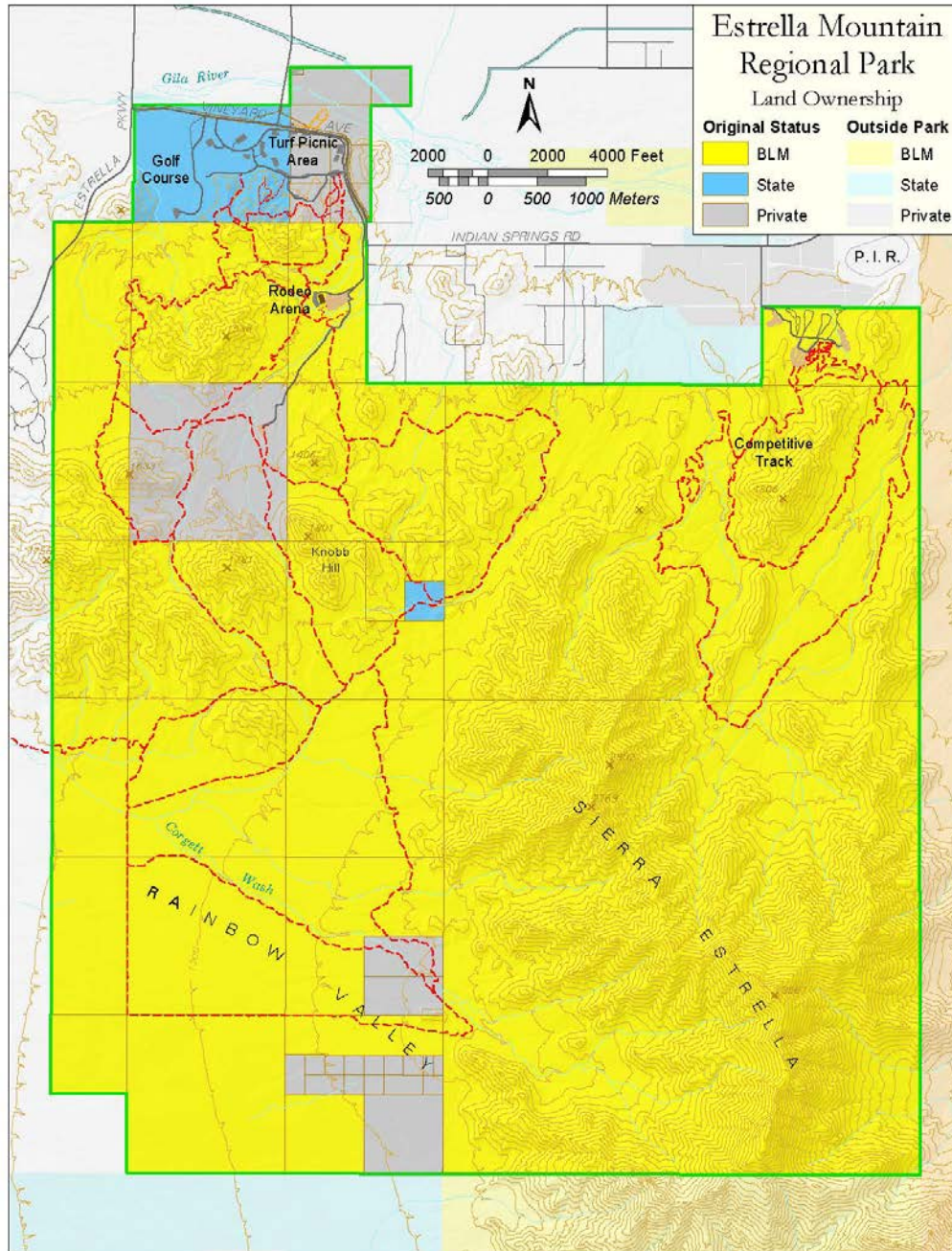


Figure 3-12: Land Ownership



Jurisdiction

Estrella Mountain Regional Park is located within the following jurisdictions (table 3-5) or service areas:

Table 3-5: Jurisdictions	
Political Unit	District
Legislative	4 & 19
Congressional	3
Maricopa County Board of Supervisors	5
Maricopa County Parks Commission	5
Municipal	
Goodyear (traffic, planning, etc.)	
Avondale (traffic, planning, etc.)	
School Districts	
Buckeye Union Hills High School District	
Liberty Elementary District (<i>predominantly</i>)	
Littleton Elementary District	
Law Enforcement	
Maricopa County Sheriff's Office	

3.10.2 Existing Land Use and Zoning

Existing Land Use

Much of the lands adjacent or near the park’s northern boundary is a mix of commercial, residential, and agricultural and largely under private ownership (figure 3-13). The City of Goodyear owns a 120-acre parcel (zoned agricultural) located west of 137th Avenue, south of West Beverly Road, and abutting the park boundary. No information is available regarding its intended use.

The City of Goodyear’s planning boundary covers the western half of the park. The Goodyear 2020 General Plan specifies open space, scenic neighborhood, and neighborhood classifications along the western boundary of the park. There is a small residential development adjacent to the park’s west boundary and Estrella Foothills High School is located south of this small development. Estrella Mountain Ranch, a larger residential community, is located west of Estrella Parkway.

The City of Avondale’s planning boundary covers the eastern half of the park. The City’s General Plan 2030 (adopted April 2012) identifies the area that includes Phoenix International Raceway (PIR) as a “sports and entertainment” land use designation. The Gila River Indian Community (GRIC) also lies east of the park and today stands at about 373,599 acres or 583 square miles.

Lands to the southwest are largely agricultural or vacant in nature while they are held in trust and managed by Arizona State Land Department (ASLD). The ASLD mission is to maximize revenue for Trust beneficiaries through the sale or leasing of state land, as such these lands are under a lease.

Lastly, the BLM maintains stewardship of 3,100 acres near the southeast park boundary.

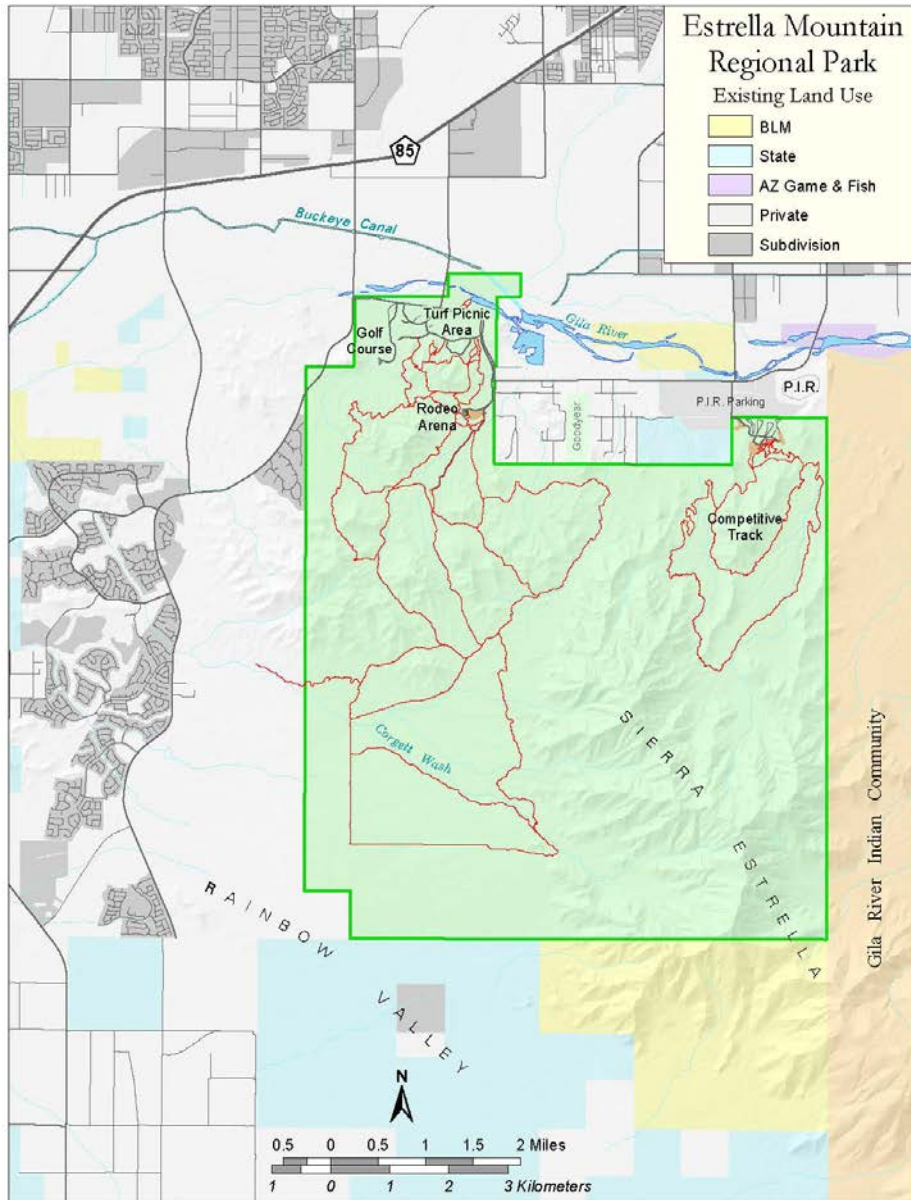


Figure 3-13: Existing land use

Zoning

The area within park boundaries is zoned RU-43 or RU-190 by Maricopa County. The unincorporated parcels immediately outside of park boundaries are also zoned RU-43 or RU-190 on which some properties have mining exemptions.

- RU-43 (Rural Residential): one dwelling unit³⁴ per 43,000 square feet - protects farm and agricultural uses and permits recreational and institutional uses.
- RU-190 (Rural Residential): one dwelling unit³⁵ per 190,000 square feet - protects farm and agricultural uses and permits recreational and institutional uses.

³⁴ Maricopa County Zoning Ordinance, Chapter 5 Rural Zoning Districts, Pages 13-15 of 15.
http://www.maricopa.gov/planning/Resources/Ordinances/pdf/reform_ordinance/mczo1.pdf as accessed April 12, 2012.



Land use surrounding the park is a mix of commercial, residential, and agricultural, however, much of the area is currently vacant regardless of its current zoning category.³⁶ Areas north and west of the park fall within the City of Goodyear's planning area and are largely zoned for master planned communities. The City of Avondale's planning area falls north and east of the park. These areas are discussed further in the "Future Land Use" section below.

3.10.3 Future Land Use

Much of the land surrounding the park is held in trust by ASLD and could be sold or leased at market value for development purposes. Other jurisdictions have planning documents in place to facilitate development around the Estrella area. Land use maps are not zoning maps; they merely reflect the general desired use of the area rather than specific zoning / development standards at a specific site.

Maricopa County (unincorporated areas) and Private Property

Privately owned parcel(s) just outside of park's eastern boundary and within the unincorporated County are currently zoned RU-43 and RU-190 which limits housing density to protect the agricultural or rural character of the area; however this is subject to change pending any new zoning or variance applications.

City of Goodyear

The Goodyear 2025 General Plan was ratified by City voters on November 4, 2014 and will remain in effect until the year 2025 or until a major amendment occurs. Chapter 8 of the City's plan outlines the preferred land use and transportation goals. Open space, scenic neighborhood, neighborhood classifications are noted uses along the western boundary of the park. The plan also notes arterial roadways at the park's southern boundary.

City of Avondale

The City's General Plan 2030 (adopted April 2012) identifies the area that Phoenix International Raceway (PIR) now occupies as "sports and entertainment" land use area, to include a potential resort and roadway upgrades – and notes that this is an expected growth area. Existing aggregate operations will continue to be an allowable use along the Gila River by right or by a Special Use District overlay.

Arizona State Land Department (ASLD)

As previously stated, the lands just south of the park boundary are under ASLD management and are currently vacant but subject to purchase and future development. This area falls within the City of Goodyear's planning boundary and the City has indicated the desire for arterial roadways³⁷ to support future development in this area.

³⁵ Maricopa County Zoning Ordinance, Chapter 5 Rural Zoning Districts, Pages 1-11 of 15. http://www.maricopa.gov/planning/Resources/Ordinances/pdf/reform_ordinance/mczo1.pdf as accessed April 12, 2012.

³⁶ City of Goodyear, Goodyear 2025, General Plan (draft), Chapter 8, pages 2-4 define each land use category.

³⁷ City of Goodyear General Plan 2025, page 110, <http://www.goodyearaz.gov/home/showdocument?id=10645> as accessed December 23, 2015.



3.11 Major Facilities and Infrastructure

Most of the park's existing development occurs in the northern 220 acres (approximately) of the park where the golf course, nature center, ball fields, and picnic areas converge. Figure 3-14 outlines the major facilities and infrastructure found in this portion of the park and is further discussed within this section.

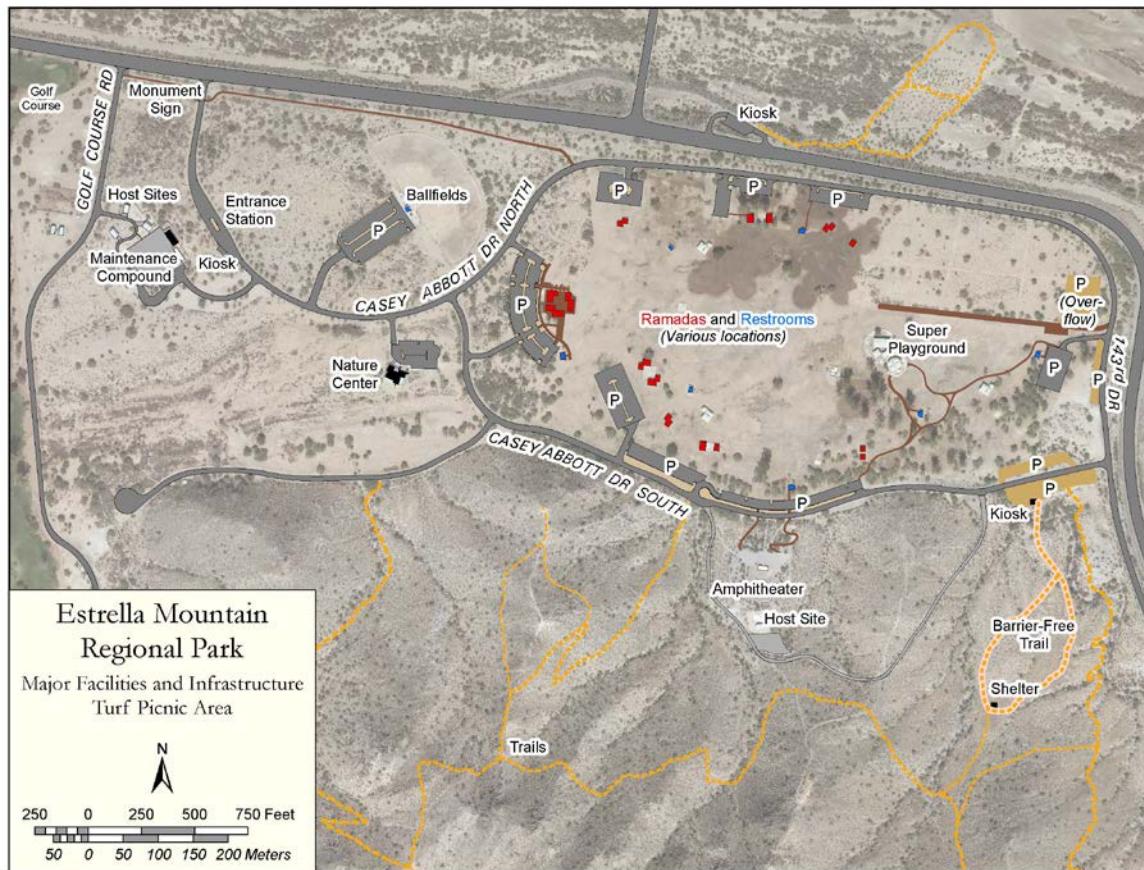


Figure 3-14: Turf area facilities

3.11.1 Entrance Station

The main entrance and contact station, is located off of Casey Abbot Drive North on the northwest side of the park and is the park's primary entrance.

3.11.2 Nature Center

The Nature Center, opened in 2008, provides a space to purchase retail items and park souvenirs. The Nature Center also has a classroom that can accommodate up to 15 tables or 50 chairs for educational programs or other events. Behind it, there is an outdoor patio with a spectacular mountain view. The Nature Center may be rented by the public for special occasions or meetings.

3.11.3 Maintenance Compound

Once inside the park, the Camino Hildalgo roadway provides access to the maintenance compound. A fueling station and storage for vehicles, tools, and other equipment is housed within the maintenance compound. The Spill Prevention Control and Countermeasures Plan (SPCC, January 2014, pages 6-7)



prepared by Engineering & Environmental Consultants, Inc. describes the area in detail. “The maintenance facility (site) drains from north to south to a detention area on the southwest of the property. Overflow from the detention area could reach a wash along Estrella Parkway. This wash extends north, passes under West Vineyard Avenue through a culvert and into the Gila River.”

The SPCC also describes the site as “...a paved lot surrounded by a block wall. The lot contains two (2) ASTs³⁸; one (1) 2,000-gallon unleaded gasoline tank, and one (1) 2,000-gallon diesel tank. There is one wash rack for vehicle washing and one spill control drainage area to the north of the 2,000-gallon tanks. These have central drains that collect the water and any spilled fuel and convey it by underground piping to an underground storage vault with a capacity of 1,050-gallons. The contents of the vault are pumped out and disposed of as needed. A used oil 55-gallon drum is stored at the center of the site. Secondary containment is provided by a drip pan. Access to the septic tank is provided by a manhole cover on the northeast corner of the lot behind the maintenance shed. The septic tank releases into a leach field north of the property. All stormwater runoff from the site leaves the site one of two ways: runoff sheet flow which flows from the site through small openings in the wall to a retention basin on the south end of the property, or into the wash rack and spill control drains and thereby into the underground holding tank.” For maintenance, inspection, and spill control measures for this area, refer to the most recent Spill Prevention Control & Countermeasures Plan.

3.11.4 Picnic Areas

Estrella Mountain Regional Park currently offers 114 picnic tables within its picnic areas. One large group area, Ramada 9 with 48 tables, can accommodate groups up to 380 people and may be reserved for a fee in four-hour increments. If not marked as reserved, all picnic ramadas are available on a first-come, first-served basis. All picnic sites are considered day-use only; all have restrooms nearby. Table 3-6 describes each picnic area.

Ramada	Description
1	On the north side of the picnic loop, has 6 picnic tables, one large grill and a fire ring. This area can seat about 36-48.
2	On the north side of the picnic loop, has 2 ramadas with a large patio between them. Each ramada has 5 picnic tables and 1 large grill. There is a large fire pit, volleyball poles, a basketball hoop and shade trees. For a total of 10 tables, this area can seat about 60-80.
3	On the north side of the picnic loop, has 6 picnic tables, one large grill and a fire ring. This area can seat about 36-48.
4	On the north side of the picnic loop, has 4 picnic tables and can seat about 24-32, and 1 large grill. This ramada is closest to the Super Playground.
5	Newly built near the Navy Area, has 2 ramadas with a large patio between them. Each ramada has 4 picnic tables and 1 grill. There is a small basketball court nearby. This area can seat about 48-64.
6	On the south side of the picnic loop, has 2 large ramadas with a large patio between them. There are 10 picnic tables, 2 large grills, a basketball hoop and a fire ring. For a total of 10 tables, this area can seat about 60-80.
7	On the south side of the picnic loop, has 6 picnic tables, one large grill, a fire ring, and a basketball hoop. This area can seat about 36-48.
8	On the south side of the picnic loop, has 2 large ramadas with a large patio between them. There are 16 picnic tables, 2 large grills, a fire ring, and a basketball hoop. This area can seat about 84-128.

³⁸ An AST is described as a 2,000-gallon steel tank enclosed in a concrete vault and is adequate under EPA guidelines to provide secondary containment.



9	Situated in a plaza, it is on the west end of the picnic loop near the park entrance. There are 48 picnic tables, 4 large grills, a fire pit with seating, a large parking lot and a restroom nearby. This area can seat up to 380.
---	---

3.11.5 Campgrounds

The park does not have a designated campground that is comparable to other parks in the system and is makeshift at best. The park offers 15 RV sites; however, they are most commonly used by concessionaires or by volunteer park hosts who assist with park operations. These sites are seldom open for public rental. Each host site has a large parking area to accommodate up to a 45' RV and is considered a "Developed Site" with water, septic and an electrical hookup, as well as a picnic table and a barbecue fire ring.

Scout and Youth groups may camp at one of the ramadas or at the Navy Area, located on the east end of park's picnic loop. Groups are permitted to camp on the turf and under shade trees. Picnic tables, barbecues and fire pits are provided. Trailheads and hiking trails are nearby as are restrooms with flush toilets (shower facilities are not available). Likewise, the rodeo arena parking lot may also be used for camping and can accommodate many trailers.

Backcountry Camping

Overnight backpacking, with a permit, is allowed. This is for "low impact" camping, i.e. no fires and pack out what is packed in.

3.11.6 Playgrounds

The park received new playscape equipment in 2014 and 2015 (figure 3-15). The park has one playground (currently located close to Ramada 4). Additional improvements are expected to occur in year 2016 in order to complete the playscape experience with additional pieces, shade, and seating.



Figure 3-15: Super Playground equipment

Playgrounds are inspected regularly by park staff for obvious signs of disrepair. Additionally, playgrounds are inspected periodically by a certified playground inspector (via an IGA with the City of Phoenix or by Department staff) to ensure each playground complies with current safety and ADA standards. Inspection reports are kept on file at the park's administrative office.

3.11.7 Rodeo Arena

Built in 1981, the rodeo arena is showing its age. The arena is lighted and offers water and electricity. The arena features six bucking chutes, a calf roping chute, north and south stripping chutes, six large holding pens, a warm-up arena, load/unloading chute, restrooms, and announcer's stand (figure 3-16). The bleachers are handicap accessible. Many of these components are in need of extensive repair in order to be comparable to newer and more modern facilities elsewhere in the valley.



It is available to rent for most types of equestrian competition or livestock events. Although it has a full-scale set-up, it is most suitable for amateur, or youth, and entry-level professional competitors. Special event access can be controlled by access gates on 143rd Avenue.



Figure 3-16: Rodeo Arena facilities

3.11.8 Amphitheater

The 300-plus seat amphitheater is located up on the hillside just south of the turf area. It is accessed by West Amphitheater Drive. It has a large stage that may be used for presentations and a small parking lot. There are two developed RV camp sites that are typically used by park hosts. Both the roadway and the amphitheater are aged and in need of extensive repair.

3.11.9 Potable Water

In mid-2014 a cursory review was performed on the existing water system in order to estimate future needs. The results of that review indicated that the potable water supply system was in good working order and produced adequate flow and pressure.

The review noted that the park receives its potable water from the City of Goodyear via a 6-inch diameter connection to a 12-inch diameter water main pipeline that is located near the park entrance and Vineyard Avenue. The 6-inch diameter connection traverses thru a 6"x4" reducer, thru a 4-inch turbo water meter and 6-inch backflow prevention device, to a 6-inch ductile iron pipe (DIP) distribution



pipeline. The distribution pipeline traverses thru the park and loops back into a 6-inch diameter backflow prevention device and 4-inch water meter, which connects back to the City of Goodyear's 12-inch diameter water main. As-built drawings show that several half-inch diameter to 2-inch diameter feeds have been installed in various locations and connect to the 6-inch DIP waterline.³⁹

Fire protection is currently achieved thru fire hydrant assemblies connected to a 6-inch diameter DIP water pipeline supplied by the City of Goodyear.⁴⁰ The potable water and fire protection connections are tracked with a master meter for the entire park.

3.11.10 Electrical

Estrella Mountain Regional Park receives its electricity from Arizona Public Service Company (APS).

3.11.11 Asset Inventory

As the first park in the system, many park facilities were built in the 1960s through 1970s and in 1993 and are showing their age. By assigning each building type an estimated lifespan, park management can better plan budgets for the years when major repairs or replacements are estimated to occur. Having such a large number of buildings within the same age bracket could indicate that their expected usefulness, or lifecycle, expires at the same time. Management should be ready to make decisions at that time that may include extensive renovation or total replacement. Appendix H contains a building inventory; this appendix section is to be updated and replaced as needed.

For example, the most visible park assets are the monument sign and nature center (both constructed in 2008). Assuming a 50-year useful lifespan for these two structures, it can be estimated that both will need replacement or extensive renovation by 2058. *Note: This is outside of annual maintenance and general upkeep measures.*

3.12 Socioeconomics

Nearly 60% of the state's residents live in Maricopa County. This section compares population characteristics in more detail at the state, county, and park levels.

3.12.1 Population Characteristics

The 2010 Census reveals that the State of Arizona has 6,392,017 people (a 24.6% increase from the 2000 census⁴¹) with 3,817,117 residing in Maricopa County. Women slightly outnumber men in the state and county; and women also outnumber men as visitors to the park. There were 443,971 households with people under the age of 18⁴² years. County-wide, the median age was 34.6 years compared to 42.5 for the park. This is detailed in table 3-7.

³⁹ Estrella Mountain Park Preliminary Utility Infrastructure Report, October 16, 2014, Ritoch Powell & Associates as prepared for Estrella Youth Sports, page 2.

⁴⁰ Estrella Mountain Park Preliminary Utility Infrastructure Report, October 16, 2014, Ritoch Powell & Associates as prepared for Estrella Youth Sports, page 2.

⁴¹ As result of the population increase, Arizona gained one member to the House of Representatives, bringing the number to nine for the state.

⁴² 2010 US Census Bureau, <http://2010.census.gov/2010census/popmap/ipmtext.php?fl=04> as accessed March 14, 2012.



Population by Sex/Age	State of Arizona ¹	Maricopa County ¹	Estrella MRP (2007-2008) ² Visitors	Estrella MRP (2012-2013) ³ Visitors
Total Population	6,392,017	3,817,117	138,942	87,875
Male	3,175,823 (49.6%)	1,888,465 (49.5%)	(40.1%)	(51.7%)
Female	3,216,194 (50.0%)	1,928,652 (50.5%)	(59.9%)	(48.3%)
Under 18	1,629,014	1,007,861	n/a	n/a
18 & over	4,763,003	2,809,256	n/a	n/a
20 - 24	442,584	266,872	n/a	n/a
25 - 34	856,693	541,126	n/a	n/a
35 - 49	1,249,516	786,104	n/a	(30.1%)
50 - 64	1,141,752	640,768	n/a	(19.2%)
65 & over	881,831	462,641	n/a	(7.9%)
Median Age	35.9	34.6	42.47	42.5

¹ Source: <http://2010.census.gov/2010census/popmap/ipmtext.php?fl=04>
² ASU Park Visitor Study and visitation for 2007-2008.
³ ASU Park Visitor Study and visitation for 2012-2013.
Note: totals may not equal 100% due to rounding.
n/a = data not available for direct comparison

The most noticeable differences in race or ethnicity during the 2012-2013 ASU Park Visitor Study were among the following: 72.4% of park visitors self-identified as white (up from 52.1% in 2007-2008); and 19.7% as Hispanic (down sharply from 40.5% in 2007-2008).⁴³

3.12.2 Census Tracts

The Maricopa County census tracts that include or are adjacent to the park (tracts 610.19, 822.08, 7233.03, 7233.04, 7233.07, 7233.08) have a total population estimate of over 20,000 people.⁴⁴

3.12.3 Population Forecast

In the Maricopa Association of Governments (MAG) document called [Socioeconomic Projections, Population, Housing, and Employment By Municipal Planning Area and Regional Analysis Zone \(June 2013\)](#), it is forecasted that by 2040 Maricopa County will almost double in population over the year 2010 base population resulting in an anticipated total of 6.1 million people. This means that the region will experience a growth of approximately one million people during each decade (table 3-8).

Several Municipal Planning Areas (MPA) in the west valley are projected to grow by more than 100,000 persons, including Phoenix, Buckeye, Surprise, Goodyear, and Peoria – requiring the park to pay close attention to growth in the western part of the metro-area. Those MPA's closest to the park are shown in Table 3-8.

	Total Resident Population 2010	Total Resident Population 2020	Total Resident Population 2030	Total Resident Population 2040

⁴³ 2012-2013 ASU Park Visitor Study Final Report, page 195.

⁴⁴ U.S. Census <http://www.census.gov/2010census/popmap/ipmtext.php?fl=04013> and <http://www.census.gov/2010census/popmap/ipmtext.php> as accessed December 23, 2015.



Avondale	77,900	96,600	121,500	155,300
Buckeye	62,800	103,600	183,800	313,500
Goodyear	68,000	115,300	167,600	241,400
Litchfield Park	10,500	12,000	13,800	13,800
Phoenix	1,501,300	1,711,600	1,953,800	2,198,000
Tolleson	6,600	7,000	8,200	8,900
County Total	3,823,900	4,507,200	5,359,300	6,175,000

Source: MAG, Socioeconomic Projections, June 2013. Page 5,
http://www.azmag.gov/Documents/IS_2013-06-25_MAG-Socioeconomic-Projections-Population-Housing-and-Employment-June-2013.pdf as accessed March 25, 2014.

3.12.4 Employment, Income, and Educational Attainment

The State of Arizona had an unemployment rate of 7.3% in February 2014 according to the Bureau of Labor and Statistics.⁴⁵ U.S. Census data also shows that 28.3% of Maricopa County residents have attained a bachelors degree or higher; over 2% higher than the state. Likewise, the median household income was \$50,410 which is over \$3,600 above the statewide median (table 3-9).

Population	State of Arizona ¹	Maricopa County ¹	Estrella MRP (2007-2008) ²	Estrella MRP (2012-2013) ³
Employed	<i>n/a</i>	57.2%	55.8%	74.5%
Median household income	\$46,789	\$50,410	14.8% (\$45,001 to \$60,000)	13.8% (\$45,001 to \$60,000)
College only	<i>n/a</i>	<i>n/a</i>	47.6%	56.6%
Bachelor's degree or higher (graduate school)	26.9%	29.8%	(33.3%)	(40.1%)

¹ US Census Bureau, State and County Quick Facts, <http://quickfacts.census.gov/qfd/states/04/04013.html> as accessed June 18, 2015.
² ASU Park Visitor Study, 2007-2008, page 143.
³ ASU Park Visitor Study, 2012-2023, page 205.

3.12.5 Obesity

The Centers for Disease Control and Prevention reports that 61.9% of adults in Arizona were either overweight (35.1%) or obese (26.8%) in the year 2013.⁴⁶ The Maricopa County Department of Public Health reports that 62.2% of adults in Maricopa County were either overweight (37.0%) or obese (25.2%) in the year 2010⁴⁷ but that figure has declined slightly from previous years.

⁴⁵ U.S. Bureau of Labor Statistics. <http://www.bls.gov/eag/eag.az.htm> as accessed April 23, 2014.

⁴⁶ Nutrition, Physical Activity and Obesity Data, Trends and Maps web site. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (CDC), National Center for Chronic Disease Prevention and Health Promotion, Division of Nutrition, Physical Activity and Obesity, Atlanta, GA, 2015. Available at <http://www.cdc.gov/nccdphp/DNPAO/index.html>.

⁴⁷ Maricopa County Community Health Assessment 2012, Page 50.

<http://www.maricopa.gov/publichealth/Programs/OPI/pdf/CHA-2012.pdf> as accessed June 18, 2015.



3.13 Visitation and Tourism Trends

The State of Arizona attracted 40.7 million domestic and international overnight visitors or equal to roughly 111,506 visitors per day in 2014.⁴⁸ Of those, 86% of overnight visitors were domestic travelers and 14% were international travelers.⁴⁹ Domestic visitors were about 45.1 years old, had an average household income of \$70,380, and stayed in Arizona for 3.7 nights, spending \$651 per visit.⁵⁰

3.13.1 Residency⁵¹

During fiscal year 2012-2013, only 5.5% of the park’s visitors were from out of state and 0.5% from out of the country⁵² (figure 3-17). Most park visitors are residents of Arizona (94%) with most coming from the metropolitan area and driving an average of 36.34 miles⁵³ to arrive at the park. The top five metro-area locations include:

- Goodyear 22.6%
- Phoenix 18.5%
- Avondale 14.4%
- Glendale 7.2%
- Laveen 6.2%

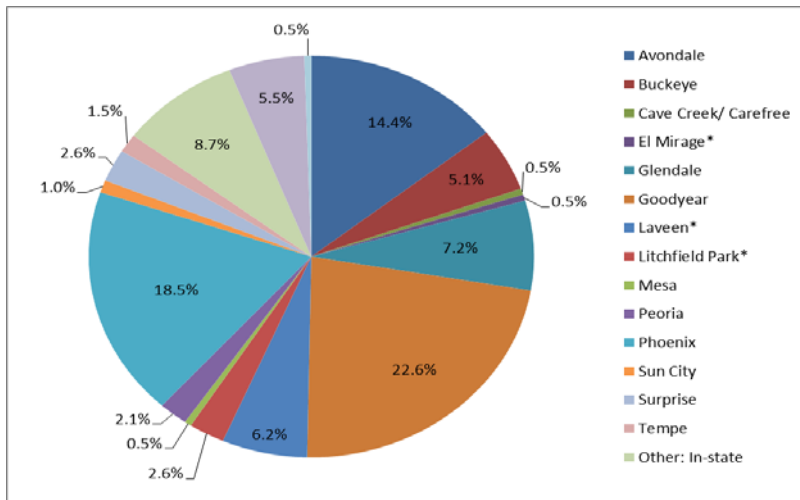


Figure 3-17: Visitor residency (*new cities denoted with asterisk)

⁴⁸ Arizona Office of Tourism, <https://tourism.az.gov/research-statistics> as accessed January 19, 2016.

⁴⁹ Arizona Office of Tourism, https://tourism.az.gov/sites/default/files/GCOT%20Research%20Presentation%202015_0.pdf, page 6, as accessed January 19, 2016.

⁵⁰ Arizona Office of Tourism, https://tourism.az.gov/sites/default/files/GCOT%20Research%20Presentation%202015_0.pdf, page 12, as accessed January 19, 2016.

⁵¹ 2012-2013 ASU Park Visitor Study Final Report, page 32, table 1.18.

⁵² 2012-2013 ASU Park Visitor Study Final Report, page 32, table 1.18.

⁵³ 2012-2013 ASU Park Visitor Study Final Report, Question 5, page 194.



3.13.2 Park Visitation

During fiscal year 2014-2015 the park welcomed 69,795 visitors to the park, the lowest within the last 11 fiscal years (figure 3-18). Park visitation has fluctuated greatly over the previous 11 fiscal years with 119,126 as the average for this period.

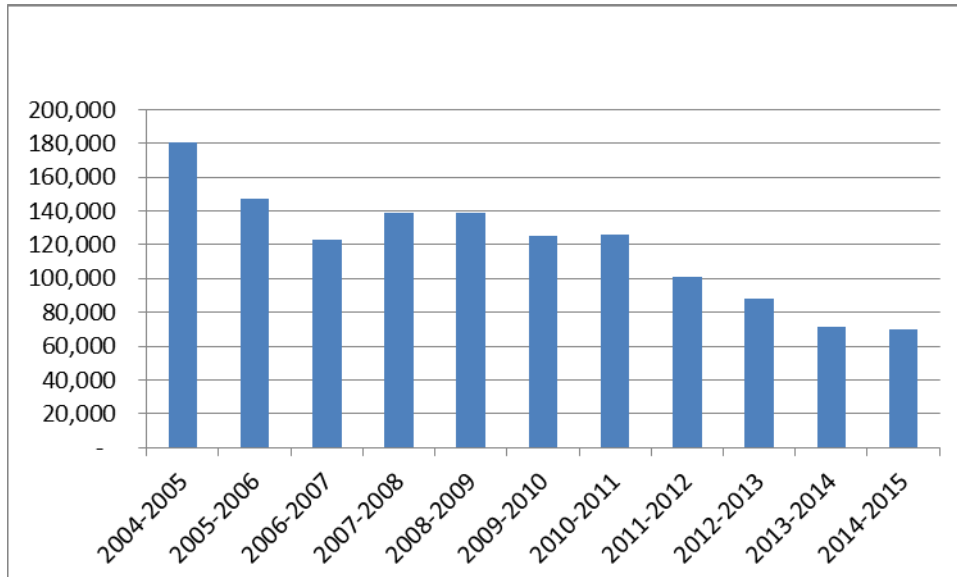


Figure 3-18: Visitation by fiscal year

Visitation can fluctuate for a variety of reasons: Spring Break, Easter, and mild temperatures usually result in March or April being the busiest months. Similar to other County parks, Easter is generally the busiest day of the year when all or most picnic areas are fully rented. The months with the lowest visitation are July and August when temperatures soar (figure 3-19).

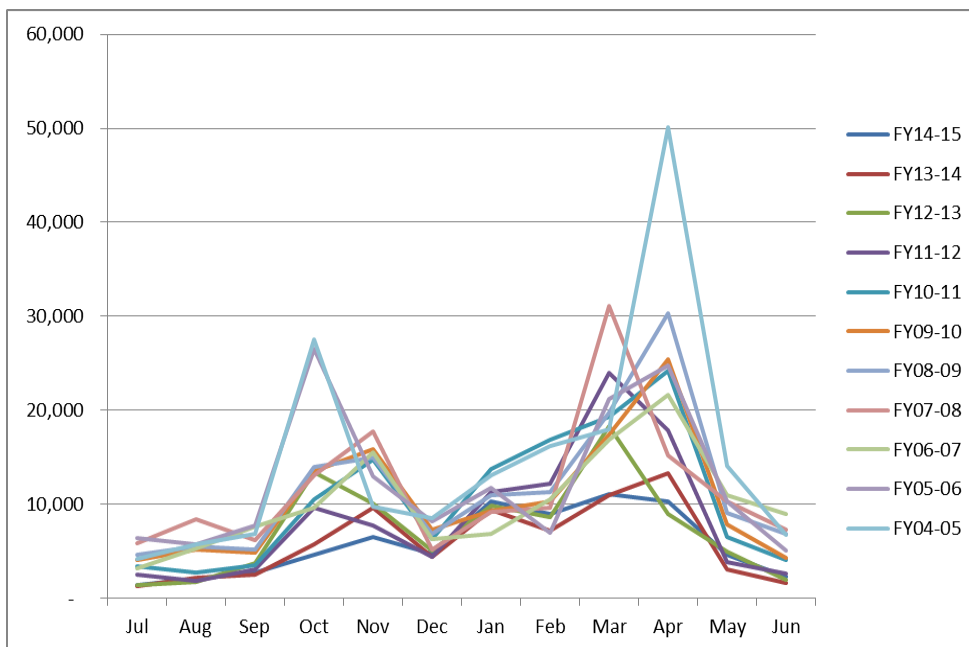


Figure 3-19: Visitation per fiscal month within fiscal year



Forecasting future visitation carries with it its own uncertainties; however, preliminary trend analysis indicates a negative trend line to future visitation (as shown by the exponential trend line applied in figure 3-20). This estimate of future visitation does not take into account any park improvement proposals mentioned later in this master plan and is based solely on past visitation data and standard spreadsheet trend line functions.

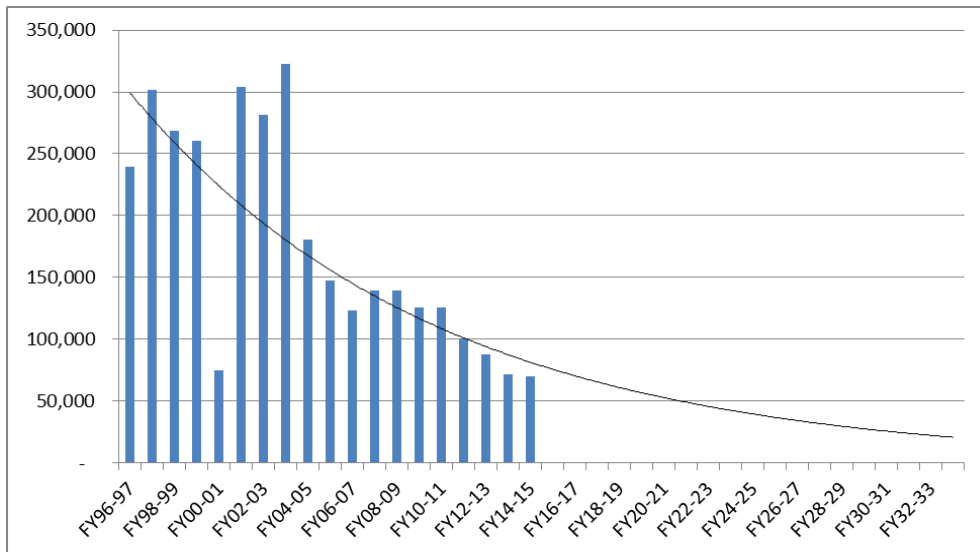


Figure 3-20: Actual and forecasted (exponential trend line) visitation per fiscal year

3.14 Park Use and Visitor Preferences

This section describes park visitor attitudes, preferences, or use patterns as gathered by ASU and as reported in the 2012-2013 Park Visitor Study Final Report.

3.14.1 Day and Overnight Use^{54, 55}

About 97% of visitors were in the park for a “day use” activity, spending an average of 2.92 hours inside the park. This is down from 3.93 hours reported in the 2007-2008 visitor use survey.

Of the 2.9% of visitors that spent the night inside the park, they stayed for an average of 2.67 nights (down from 2.84 nights in 2007-2008).

3.14.2 Primary Activity⁵⁶

Park visitors engage in a range of activities during their visit (trail hiking, picnicking, photography, mountain biking, nature study, and more); however one activity is usually considered the primary activity, or what the visitor specifically came to the park to do. The top five primary activities in 2012-2013 were:

- Trail hiking (73.7%)
- Mountain biking (7.3%)
- Picnicking (7.3%)

⁵⁴ 2012-2013 ASU Park Visitor Study Final Report, Question 4, page 194.

⁵⁵ 2012-2013 ASU Park Visitor Study Final Report, Question 1, page 305.

⁵⁶ 2012-2013 ASU Park Visitor Study Final Report, Table 1.9A, page 23.



- Running/jogging (3.7%)
- Walking for pleasure (1.5%)

3.14.3 Return Visits

Seventy-four percent of those surveyed were return visitors, visiting the park nearly 20 times on average in the previous twelve months⁵⁷ (up from 13 visits in 2007-2008). When asked what prompts visitors to return to the park, trail-related responses were most common; other written responses included the park being close to home and its cleanliness.⁵⁸

Return visits based on activity, reveals that walkers made 117 visits and runners/joggers returned 151 times within the last 12 months (both by far the highest mean averages in the system). Hikers made over 14 return visits in the previous twelve months and mountain bikers made over 19 return visits. Picnickers made just over three return visits to the park.⁵⁹

3.14.4 Reasons for Use⁶⁰

Visitors come to the park for a variety of reasons, and among them include:

- Enjoy the solitude
- Enjoy physical exercise
- Improve my physical health
- Observe the scenic beauty
- Get away from everyday responsibilities
- To experience the open space.

3.14.5 Satisfaction

When asked about their level of satisfaction with the park, 43.8% of those surveyed were extremely satisfied and 46.3% were very satisfied with the park; 10.0% were fairly satisfied. No visitors that were surveyed by ASU expressed dissatisfaction with the park.⁶¹

3.14.6 Attachment to Park

Park visitors often form strong attachments to their favorite park or locations within a park and about 40% of the parks visitors agree that they are, indeed, very attached to this park. Nearly 67% agreed that the park means a lot to them; 50% agreed that this park offers the best settings and facilities for the activities that they enjoy most.⁶² Favorite parts of the park included many trail-related responses, specifically mentioning Baseline Trail and the park's views.

⁵⁷ 2012-2013 ASU Park Visitor Study Final Report, Question 1, page 194.

⁵⁸ 2012-2013 ASU Park Visitor Study Final Report, Question 7b, page 208.

⁵⁹ 2012-2013 ASU Park Visitor Study Final Report, Table 3.4 page 88.

⁶⁰ 2012-2013 ASU Park Visitor Study Final Report, Question 6, page 197. Responses of *Important* and *Extremely Important*.

⁶¹ 2012-2013 ASU Park Visitor Study Final Report, Question 11, page 195.

⁶² 2012-2013 ASU Park Visitor Study Final Report, Question 7, page 198.



3.14.7 Visitor Spending and Economic Impact

The 2012-2013 ASU Visitor Use Survey shows that visitors reported spending \$46.30 per group for their visit to the park (down significantly from \$138.31 in 2007-2008). This is also significantly lower than the system-wide average of \$157.63 per visit.⁶³

In 2014, the Department asked ASU to study the economic impacts⁶⁴ of the County park system. Impacts were estimated by inputting operating expenses, visitor spending, and other data into IMPLAN software to determine multiple types of impacts. Perhaps not surprisingly, the park ranked last in visitor spending related impacts. However, based on operating expenses, the park performed well in line with other parks (table 3-10).

Park level	Visitor Spending	Operating Expenses
Full-time jobs created	0.3	7.7
Total economic impact	\$24,783	\$1,373,890
System-wide		
Full-time jobs created	138.9	116.4
Total economic impact	\$11,310,284	\$12,864,318

Source: 2014 MARICOPA COUNTY PARKS AND RECREATION DEPARTMENT STUDY REPORT
Economic Impact of the Maricopa County Parks and Recreation System, Chhabra, et al, pages 14-15.

3.14.8 Importance and Use of Park Facilities

Park visitors were surveyed about which facilities are most important to them. In the 2012-2013 survey, parking availability, park roads, multi-use trails, and restrooms were the most important features at the park. (The least important facilities were: boat ramps, equestrian facilities, playgrounds, and outdoor amphitheater.)⁶⁵

When visitors were surveyed about what facilities they would be likely to use, if provided, wildlife viewing areas or blinds, visitor/nature center, shaded picnic areas, outdoor exercise/circuit course, and restaurants/snack bars rounded out the top five responses. (The facilities that they would not use or don't know if they would use were: sewage disposal site, conference facility, RV or trailer hook-ups, OHV areas, and equestrian/horse facilities.)⁶⁶

3.15 Informal Park Surveys

From time to time Park staff may conduct its own informal or non-scientific visitor surveys to gauge how well a certain program or park amenity has been received by the public. In March and April 2015, park staff conducted an informal survey of first-come-first-served park visitors at the ramada and turf areas in an attempt to understand how they are using these areas and what draws them to the park.

⁶³ 2012-2013 ASU Park Visitor Study Final Report, Question 8, page 199 and Table 2.9, page 59.

⁶⁴ 2014 MARICOPA COUNTY PARKS AND RECREATION DEPARTMENT STUDY REPORT Economic Impact of the Maricopa County Parks and Recreation System, Chhabra, et al.

⁶⁵ 2012-2013 ASU Park Visitor Study Final Report, Question 4, page 196.

⁶⁶ 2012-2013 ASU Park Visitor Study Final Report, Question 9, page 199.



Park staff collected 127 surveys overall, of which 94 (or 79.6%) respondents were using the space on a first-come-first-served basis. Party size of these ramada visitors ranged from one to 40 with an average of 10.2 people per group. The vast majority were not annual pass holders. Roughly 15% were first-time park users; about 30% reported using the park multiple times per month; but most (about 43%) were occasional visitors that come to the park about two to five times per year. All respondents reported using the park for a variety of reasons ranging from experiencing nature, hiking, to family gatherings.

3.16 Local Recreation, Needs, and Opportunities

Estrella Mountain Regional Park has a unique opportunity to offer visitors camping, golfing, a competitive track, multi-use trails, wildlife viewing, picnicking, hunting, and other opportunities as approved park activities. The park also offers educational and interpretive events on a regular basis. Many of these activities cannot be found elsewhere in the community, giving Estrella Mountain Regional Park an opportunity to fill those needs. Other recreational opportunities near Estrella Mountain Regional Park include (table 3-11):

Facility	Distance from Park	Acres / Miles of trails	Recreational Opportunities
City of Goodyear	6.81 miles	327 acres 26.17 miles	Aquatics, sports fields or turf areas, playground, picnic sites, dog parks, bike park, trails/paths and more.
City of Avondale	7.15 miles	~208 acres	Sports fields or turf areas, picnic, dog parks, and more.
City of Buckeye	14.39 miles	8,778+	Aquatics, sports fields or turf areas, playground, picnic sites, dog park, picnic, camping, and more.
Phoenix International Raceway	4.0 miles	n/a	Viewing NASCAR racing
Cincinnati Reds Spring Training facility	2.5 miles	n/a	Professional baseball teams spring training facility.
Glendale Sports and Entertainment District, including Arizona Cardinals' Stadium (aka Jobing.com Arena / Univ. of Phoenix Stadium)	12.0 miles	n/a	Stadium for professional and college football and bowl games as well as hockey.
<p><i>Additional recreational opportunities:</i> <i>Undeveloped Camping: Camping is allowed on Bureau of Land Management lands throughout the area. Camping on State Land requires a permit from the State Land Department.</i></p>			

The [City of Goodyear's Parks, Recreation, Trails and Open Space Master Plan](#) (July 2014, pages 21, 78) identified an existing lack of sport field space for local teams as well as a growing need as the City's population increases. Estrella Mountain Regional Park currently offers two baseball fields and a local non-profit group has proposed to redevelop part of the park into multi-use sports fields; combined, the Park's existing and/or future fields may help alleviate the anticipated shortage of sports fields in this part of the valley.

3.17 Park Administration and Special Functions

This section provides a brief overview of park staffing. Additional detail may be found within the park's annual business plan.



3.17.1 Staffing

Currently, the park has a staff of five full-time employees (figure 3-21). This includes the park supervisor, one administrative assistant, one interpretive ranger, and two park maintenance workers. The park does not currently have any part-time employees.

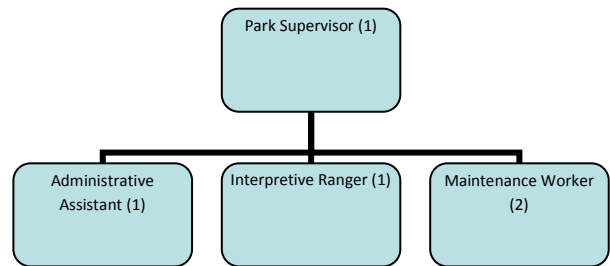


Figure 3-21: Organizational chart

A park supervisor plans, organizes, coordinates and is responsible for all operations of the park while protecting park resources. This position supervises all aspects of work and performance of subordinates to facilitate productivity and efficiency. The park supervisor also constantly coordinates activities for maximum revenue and most efficient utilization of facilities including outdoor education and wellness programs for park users. This position is also responsible for marketing efforts to promote the park, operating within the budget and providing detail for formulation of budget as related to grants, capital improvement projects and park projects.

An administrative assistant performs clerical duties in support of park operations to include but not limited to: proper cash handling during fee collection, preparing daily deposits, reconciliation, revenue recording and reporting, administrative reporting and support, processing camping and ramada reservations, souvenir program oversight, and customer service via the phone, mail and email.

An interpretive ranger plans, organizes, promotes, conducts, and evaluates outdoor recreation and environmental educational programs to include maintaining and demonstrations of live animal and plant displays. This position provides customer service by assisting and providing information and park interpretation to park visitors, the general public, County departments, other agencies, volunteers, and community groups. Responsibilities also include accurate reporting of program attendance, fee collection and reconciliation, and occasional response to emergency situations.

A park maintenance worker performs general facilities management to include but not limited to: cleaning and maintaining restrooms, trash collection, painting interiors and external structures, graffiti removal, minor plumbing and electrical repairs, fence repair, trail maintenance and signage, desert landscaping maintenance, and customer service to park visitors.

3.17.2 Volunteers

The park utilized over 60 volunteers in FY14-15 who provided over 16,521 hours of service such as camp hosts, entrance station attendants, nature center hosts, among other roles (table 3-12). The Independent Sector estimates that the value of volunteer time was worth \$22.37 per hour for the state of Arizona in 2014.⁶⁷ This translates to volunteers providing \$369,585.95 worth of services or the equivalent of almost eight full-time⁶⁸ employees, providing an enormous economic value to the park each year.

⁶⁷ Independent Sector, dollar value by state for year 2014, http://www.independentsector.org/volunteer_time as accessed January 19, 2016.

⁶⁸ FTE = total volunteer hours divided by 2,080 hours (2,080 = 40 hours week * 52 weeks).



Volunteer Type	2011-2012		2012-2013		2013-2014		2014-2015	
	Volunteers	Hours	Volunteers	Hours	Volunteers	Hours	Volunteers	Hours
Park Hosts	14	8,220	18	10,544	13	8,452	14	15,567
Community Volunteers	13	639	14	475	7	475	7	911
Episodic (groups)	4	943	4	148.	2	160	2	43.5
Total		9,802		11,167		9,087		16,521.5

A park host will assist the park supervisor and serve as an ambassador to park visitors by providing information and promoting resource protection and recreational opportunities through visitor education. Duties may include fee collection, light maintenance work, clerical tasks, trail maintenance, and special projects. In return for 40 hours of service, the park host(s) is allowed to utilize camping sites and use park facilities while they are serving as hosts.

Community volunteers may provide administrative, trails, education, special event, or maintenance assistance. Episodic volunteers give their time for a special project, rather than volunteering on an on-going basis. See the Volunteer Manual, Making a Difference and webpage⁶⁹ for more details on volunteer roles and responsibilities.

Episodic volunteers may assist in short-term, special projects. For example, Three Rivers Historical Society volunteers performed trail maintenance on several occasions along the Centennial Trail during fiscal year 2012-2013, providing valuable assistance to the park.

3.17.3 Partnerships

Estrella Mountain Regional Park has identified several partners or other organizations with a mutual interest in the park's operation and success. Table 3-13 specifies existing and potential partners and their roles in the operation and improvement of the park.

Partner	Potential or existing role
Maricopa County Agencies	Parks Commission: Lobby and advocate for park causes. Flood Control District (FCD): river related issues and El Rio. Sheriff's Office (MCSO): Regularly patrols park, trails, and boundaries. Department of Transportation (MCDOT): Road maintenance.
State Agencies	Arizona Office of Tourism: Cooperative work on attracting tourism, especially "Watchable Wildlife" tourists. Arizona Game and Fish Department: Variety of wildlife issues, advice and enforcement. Arizona State Land Department: Protection of adjoining property and access issues. Arizona State Parks: Site Steward Program (and SHPO) Volunteers regularly patrol and check on archaeological sites in park.
Federal Agencies	BLM: Land exchange/purchase, R&PP consultation.
Local cities/towns	City of Goodyear: Trail connections, public safety, and other partnerships. City of Avondale: Trail connections and other partnerships. City of Phoenix: Playground inspections.
Citizens for Estrella Mountain Park, Inc. (CEMP)	Perform fundraising for specific projects. A voice and advocate for the park.

⁶⁹ Website and Volunteer Manual available here: <http://www.maricopa.gov/parks/volunteer.aspx>



Equestrian, RV, Mountain Bike, Special Interests	Work with individual groups on special interest desires when possible.
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3.18 Public Safety

The park relies on the Maricopa County Sherriff's Office (MCSO) for law enforcement and public safety. MCSO may be contacted by using the following phone numbers:

- 602-876-1011 for non-emergency needs; and
- 911 for emergencies.

MCSO keeps track of all contacts and reports it produces (table 3-14). Note that inconsistencies with the data may exist based upon where the call was located; i.e. if it was actually outside the park boundary but responding units did not correct that location with dispatch. Additionally, MCSO began using new software in 2013 that may also account for some inconsistencies during part of that year.

Estrella Mountain Regional Park					
	2009	2010	2011	2012	2013
Contacts (all) ¹	64	58	61	59	42
Search & Rescue Operation	1	3	0	0	1
Sick/Injured Person	2	0	4	0	3
County Parks Violation	6	5	1	1	1
Fire Violation (R113)	1	1	0	1	1
Vehicle & Bicycle Violation (R107)	0	0	0	2	0
Camping Violation (R112)	0	0	1	0	0
Game & Fish Violation	0	0	0	1	0
Burglary from vehicle	0	0	1	0	0
Theft/Burglary Metals Copper Aluminum	0	1	2	0	1
Notes: 1. Totals exclude "Patrol/Vacation Watch" category. Source: personal communication from MCSO Sgt. Fred McCann to Don Harris, 5/1/14.					

The City of Goodyear also provides public safety and rescue support. Park staff and its volunteers also provide park visitors with safety messages and summon assistance when needed. Park visitors are expected to know and comply with all park rules.

3.18.1 Fire and Fire Bans

Park Rule R-113 outlines acceptable use of fire and grills. MCPRD implements fire bans during the warm summer months to help prevent destructive fires. The bans are lifted as soon as the prevailing weather conditions permit. Some limited use of grills may be permitted unless under an extreme fire ban.

3.19 Finances

This section includes park budget and revenue trends. The charts or tables exhibited below reflect year to year trends when available. More detailed budget and financial information is contained in the park's annual business plan. This section should not be considered a complete audit-level look into park finances, but rather a generalized view of some specific categories and a general trend analysis.



From the data presented here, the reader may ascertain the more recent revenue intake is less than the park expenditures. For example, in fiscal year 2015 the park’s revenue was \$480,205 but its expenses were just over \$656,828 – requiring that the Department’s overall budget subsidize the difference. This means the park has an approximately 73% self-sufficiency level for fiscal year 2015.

3.19.1 Park Budget

The park budget consists of components shown below such as park revenue, park expenditures, and park donations. Park staff is responsible for revenue generation and staying within the budget formulated by the Department’s finance team.

3.19.2 Park Revenue

Park revenue comes from many sources but primarily from visitor entrance fees, camping and picnic reservations, souvenir sales, etc. The park also receives revenue from its concessionaires (mainly the golf course and horse rental rides). Revenue is also generated through an agreement with PIR for camping two to three times per year. Special use permits also generate revenue for the park.

Other funding sources may come from grants or other partnerships, but those funds are generally earmarked for specific projects or purposes. Revenue is generally increasing each year (figure 3-22) due to improved or additional facilities as well as from improved marketing.

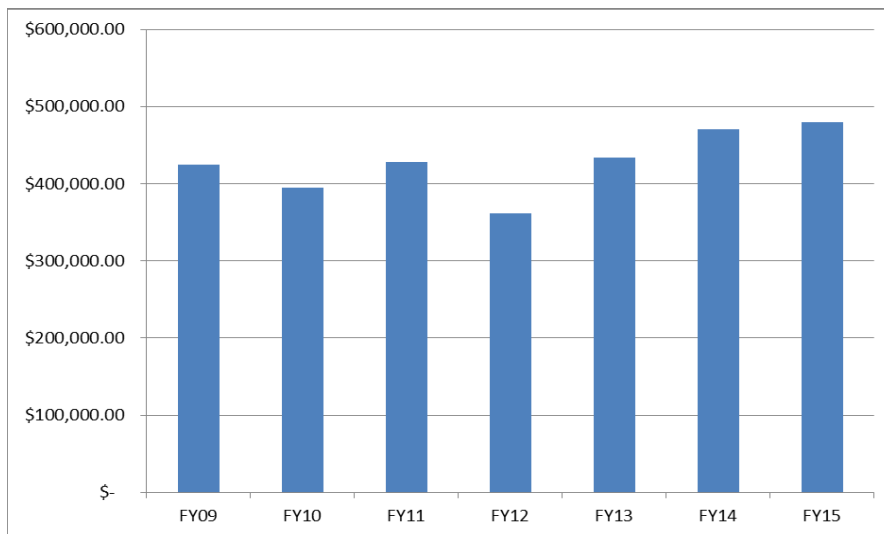


Figure 3-22: Revenue per Fiscal Year

Figure 3-23 demonstrates the monthly breakdown of the fiscal year 2015, noticing that the cooler and winter months show the largest values, very similar to visitation trends. A spike is noted in April 2015 for the Easter holiday weekend, as well as the weekend that precedes Easter; this spike may shift each year as the date of the holiday changes.

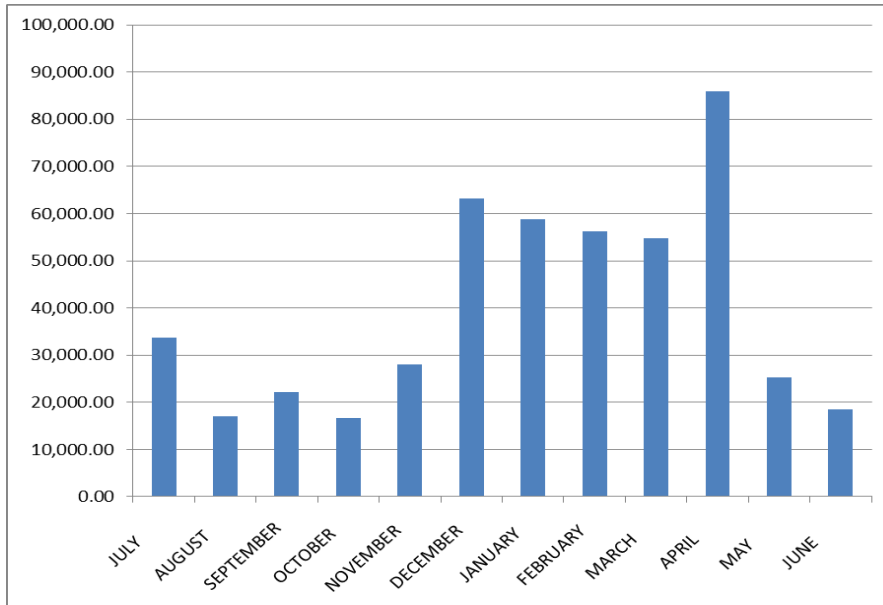


Figure 3-23: Revenue by Month in FY15

A lack of camping accommodations at the park results in low camping revenue figures (figure 3-24). The park is a popular group camping location for youth groups.

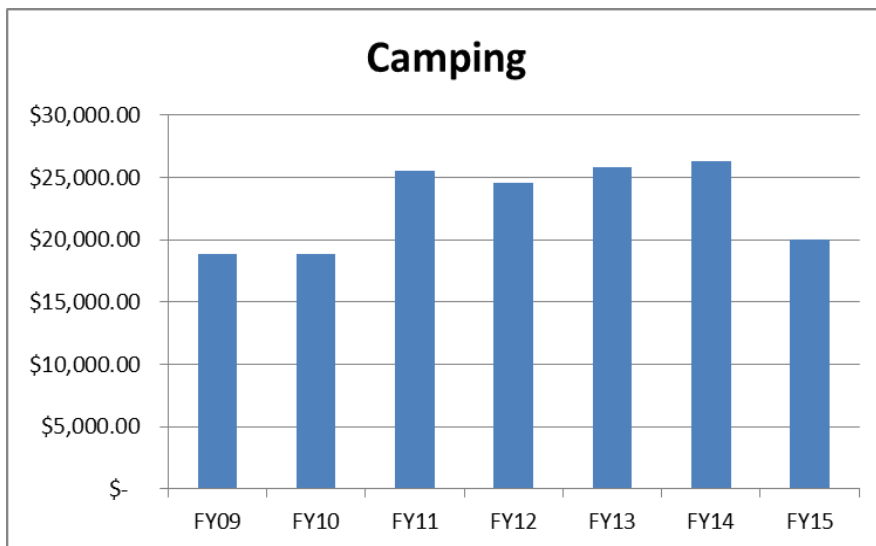


Figure 3-24: Camping per Fiscal Year

Facility rentals remain fairly consistent (figure 3-25) year to year. Rentals include the nature center, ramadas, or other facilities.

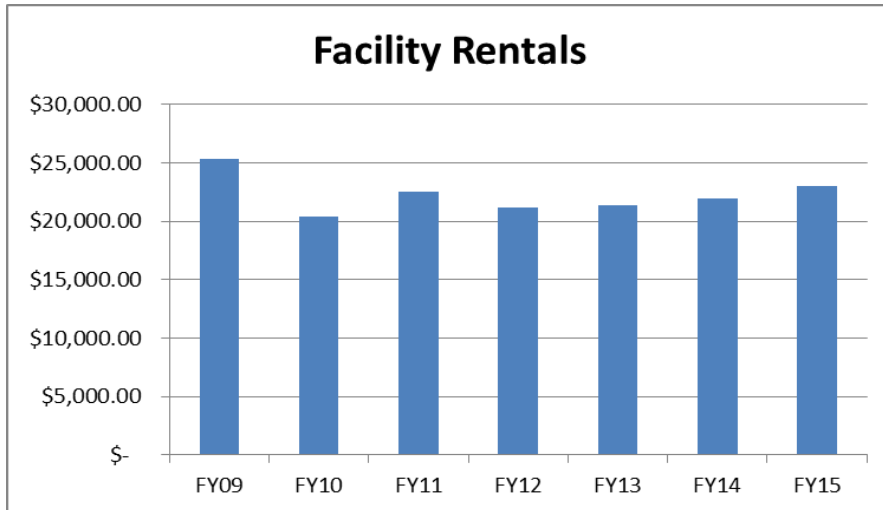


Figure 3-25: Facility Rentals

Annual pass sales show an overall upward trend from year to year (figure 3-26) and is expected to increase. Park visitors have expressed their satisfaction with the annual pass program.

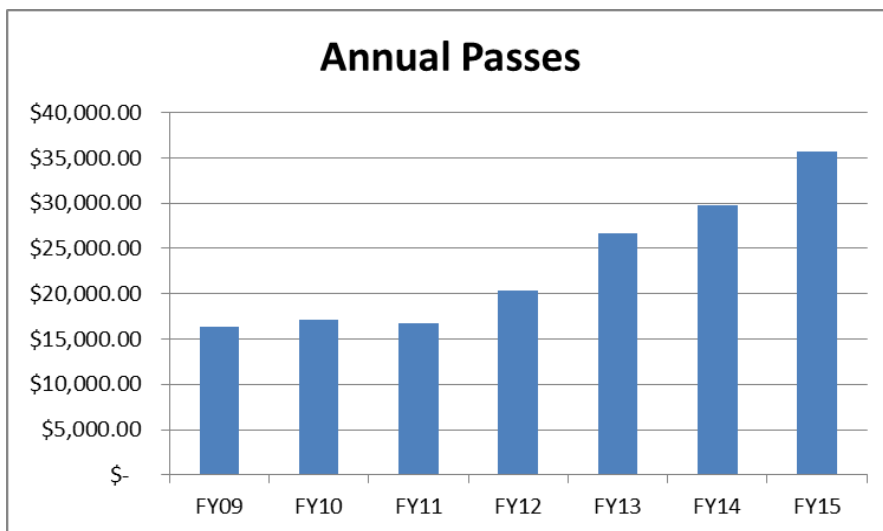


Figure 3-26: Annual Passes

Daily entry pass levels fluctuate with overall visitation (figure 3-27).

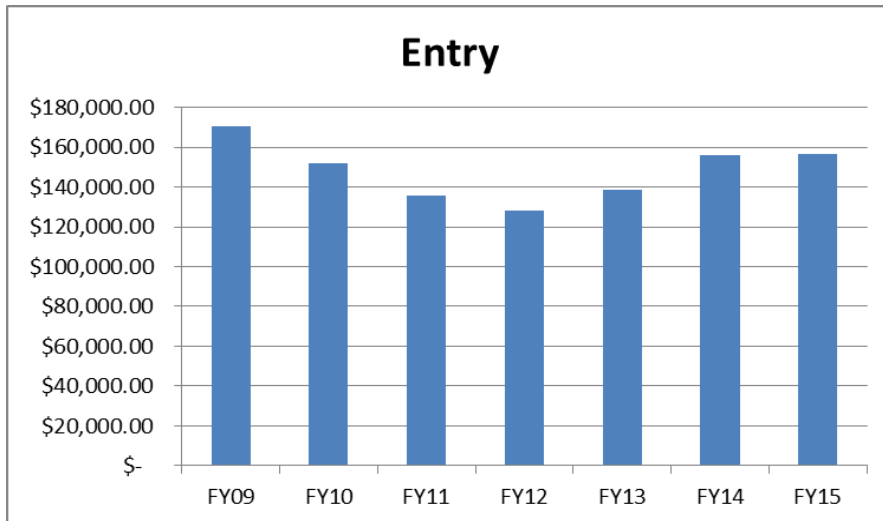


Figure 3-27: Daily Pass Entries

3.19.3 Expenditures

Park expenditures cover everything from park staff wages and benefits, maintenance, as well as general office supplies, vehicle maintenance and fueling (table 3-15). Although facility needs have increased, staff levels have remained the same for several years. The park covers extra staffing needs with additional hosts and volunteers.

Expense type	FY 2014	FY 2015
Personal Services (wages and benefits)	\$155,540.42	\$165,693.68
General Supplies	\$15,180.01	\$16,355.80
Fuel	\$7,675.96	\$6,940.19
Utilities - electricity	\$83,120.25	\$68,648.23
Utilities - water	\$14,133.49	\$18,636.33
Repairs and Maintenance*	\$41,280.01	\$357,175.31
TOTAL EXPENSES (all types)	\$323,124.10	\$656,828.53

*includes expense categories 812 and 825

3.19.4 Donations

Donations to the Park are accepted pursuant to [ARS §11-941](#), paragraph A and are used for designated items such as memorial benches, ramadas, brochures, critter care, or general use. Donations (table 3-16) to the park represent a small, but important, percentage of income to the park.

	FY 2014	FY 2015
Amount	\$429.61	\$215.40



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CHAPTER 4 – ROADS

This master plan varies slightly from the White Tank Mountain Regional Park Master Plan template in that it includes a roads chapter. Estrella Mountain Regional Park, already unique to the park system, faces a multitude of existing and potential challenges depending on which park improvement opportunities are chosen for the park. The Department requested that the Maricopa Department of Transportation (MCDOT) study the existing roads and to make recommendations for roadway improvements and to recommend potential new roads or access points. The result of the Estrella Mountain Regional Park Access Roads Final Roadway Evaluation September 2015 (MCDOT study) is found in Appendix I, excerpts of which are drawn out in this chapter and, in some cases, expanded upon.

4.1 Existing Roads, Access, and Parking

4.1.1 External Roads and Access

Estrella Parkway is a paved road adjacent to the west park boundary and bisects a small portion of the northwest corner of the park and transitions into an unpaved road near the park's southernmost boundary (Pecos Road alignment). Bullard Avenue extends slightly into the park's northern boundary and terminates at its intersection with Vineyard Avenue.

The intersection of Estrella Parkway and Vineyard Avenue is commonly used to access the park's main vehicular entrance and golf course entrance off of Vineyard Avenue. When travelling southbound, this intersection has no formal left turn lane onto Vineyard Avenue, forcing turning vehicles to cross oncoming traffic. The City of Goodyear predicts this section of Estrella Parkway to be over capacity by the year 2035¹. Accordingly, the City of Goodyear has included intersection upgrades² in its most recent Transportation Master Plan (June 2014). Likewise, the MCDOT study made several recommendations³ and those have been provided to the City of Goodyear for their consideration.

Vineyard Avenue to Casey Abbott Drive North serves as the park's main entrance point. Likewise, Vineyard Avenue to South Golf Course Drive provides the only vehicular entry to the golf course. The park has two other vehicular access points at approximately 143rd Avenue and Indian Springs Road and at 143rd Avenue and West Baseline Road; however, these entry points are generally gated and locked and most often go unused by the general public.

Indian Springs Road provides another vehicular access point to the park's competitive track via an easement granted over PIR property at the South Old Baseline Road alignment (sometimes labeled South Avenida Estrella). At certain times of the year, this entry point may be closed to the general

¹ City of Goodyear Transportation Master Plan (June 2014), table 3-4, page 35.

² City of Goodyear Transportation Master Plan (June 2014), (list item 73), page 54.

³ Estrella Mountain Regional Park Access Roads Final Roadway Evaluation September 2015, pages 23-27.



public while PIR holds events. During these times, there is no alternative way to reach the competitive track area.

Although old dirt roads or paths may exist into the park, the main park entry and the competitive track entrance provide the only authorized vehicle access points into the park. Additionally, the park maintains several trail entry points on the west and northern borders for non-motorized and pedestrian entry. There are currently no public vehicular roads or non-motorized entry points east or south of the park.

Table 4.1: Roadway Jurisdiction and Functional Class

Road	Jurisdiction	Functional Class
Estrella Parkway	City of Goodyear	Scenic Arterial
Vineyard Avenue	City of Goodyear	Arterial
Bullard Avenue (and bridge)	City of Goodyear	Arterial
Indian Springs Road	MCDOT	Minor Arterial

4.1.2 Internal Park Roads and Parking Lots

Park roads are designed and built to conform to the Park Road System Guidelines/Standards in effect at the time of construction as well as by compatible MCDOT roadway design manuals. The MCDOT study compared existing park roads to the newly adopted Park Road System Guidelines and by and large the existing park roads are adequate; however, it noted a couple of deficiencies in the geometric review.⁴ In these cases, the road geometrics do not meet standards for a 30 MPH design speed; however, these roads are posted at 25 MPH and subsequently should cause no impediments to sight stopping distance or superelevation.

Estrella Mountain Regional Park has just over five miles of existing paved roads that allow park visitors to circulate between activity areas. The park also has about five miles of unpaved service roads that allow park staff to provide maintenance in hard to reach areas. The park provides multiple parking lots throughout the park, totaling over 2,900 parking spaces.

Table 4.2: Park Roads and Parking

Roads	Miles	Parking	Vehicle Spaces
Paved	5.15	Designated	910
Unpaved	5.00	Undesignated	2,009

4.1.3 Classification

Park road guidelines define four types of roads: primary access, circulation, area, and special purpose. Circulatory roads, meant to move vehicles between activity sites, serve as the typical roadway classification at the park.

Table 4.3: Park Roadway Classifications

Roadway	Classification
Casey Abbott Drive North	Circulatory
Casey Abbott Drive South	Circulatory
143rd Drive	Circulatory
South Golf Course Drive	Circulatory

⁴ Estrella Mountain Regional Park Access Roads Final Roadway Evaluation September 2015, page 10.



Trailhead Drive	Area
Amphitheatre Drive	Area
Camino Hildalgo	Area
Diamondback Way	Area
Chipolte Way	Area
Arena Road	Area

The design guideline for a circulatory roadway section is shown in figure 4.1 and leaves adequate space for a four foot paved shoulder that may also be used as a bike lane.

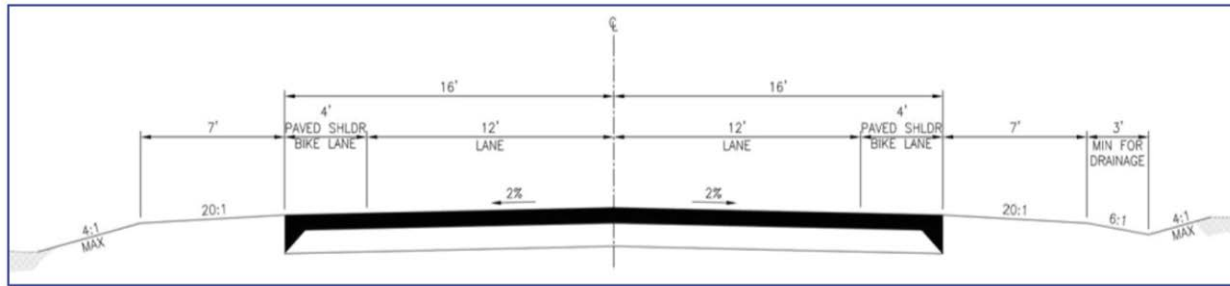


Figure 4.1: Park Circulatory Roadway section

4.1.4 Capacity

Physical capacity at the park is currently limited by the number of parking spaces. There is a minimum of 2,919 designated and undesignated parking spaces. Using the park’s average of 2.31⁵ people per vehicle, this would put peak capacity at about 6,742 visitors at any one time based on available parking alone. Further study is needed to determine the physical, environmental, and social capacity of the park.

4.1.5 Maintenance

A Maricopa County Board of Supervisors resolution dated February 21, 1984 allows MCDOT to perform construction and/or maintenance activities inside County parks and to do so using Highway User Revenue Fund (HURF) monies for park roads intended for public use. All paved and named roads are constructed and maintained by MCDOT and conform to County guidelines for park roadway systems at the time of construction. As park roads become eligible for upgrades, the road should be designed to meet the newest standard.

Additionally, most paved parking lots also have curbing; however, it is deteriorating and crumbling in many areas. Any parking lot improvements should also include curbing repairs or replacement at the same time.

Unnamed and unpaved roads are maintained by the park’s maintenance staff or the Department’s trade’s crew. Paved and unpaved parking areas are likewise constructed and/or maintained by the park maintenance staff or trades crew, but the Department will periodically contract MCDOT for these services.

Roadway	Construction Date	Pavement Type	PCR	Most Recent Work (Year)
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⁵ 2012-2013 ASU Park Visitor Study Final Report, Table 1.20A, page 34.



Casey Abbott Drive North	1993	Asphalt	91	Preservative Seal (2014)
Casey Abbott Drive South	1993	Asphalt	91	Preservative Seal (2014)
143rd Drive	1993	Asphalt	92	Preservative Seal (2014)
Golf Course Road	1993	Asphalt	91	Preservative Seal (2014)
Trailhead Drive	1993	Asphalt	91	Preservative Seal (2014)
Amphitheatre Drive	NR	NR	NR	Preservative Seal (2014)
NR = Not Reported Source: Final Roadway Evaluation, Table 2 Existing Roadway Pavement Summary, page 9, Sept. 2015				

4.1.6 Drive-time Analysis

As part of the 2009 Strategic System Master Plan, Pros Consulting⁶ (PRO's) examined drive times from the park entrance outward on roadways traveling at designated minute increments. PRO's used 2000 Census Tract estimates for 2007 populations, simplified into density categories:

- Urban (2.0 people per acre or more; 0.5 acres per person or less);
- Exurban (0.5 people to 2.0 per acre; 0.5 to 2.0 acres per person); and
- Rural (less than 0.5 people per acre; 2.0 acres per person or more).

PRO's then derived proportional population estimates for each drive time and weighted against the drive time acreages to establish average correlated people per acre and the inverted ration of acres per person. This effort to measure population against acres available is to demonstrate the need and pressure each County park will be under for the future and how to plan to meet that need in updated master plans and to serve all age groups despite pressure on the park's per person per acre ratio.

Total Population by Time Segment (minutes)			
Year	15	30	45
2007*	65,303	801,960	2,638,637
2017	106,212	1,103,520	3,493,037
Acres by Time Segment (minutes)			
	59,991	270,041	602,442
Source: 2009 Strategic System Master Plan, PRO's Consulting, page 46, 48, 52. *2000 Census Tract estimates for year 2007.			

⁶ 2009 Strategic System Master Plan, PROs Consulting. Page 45-47.

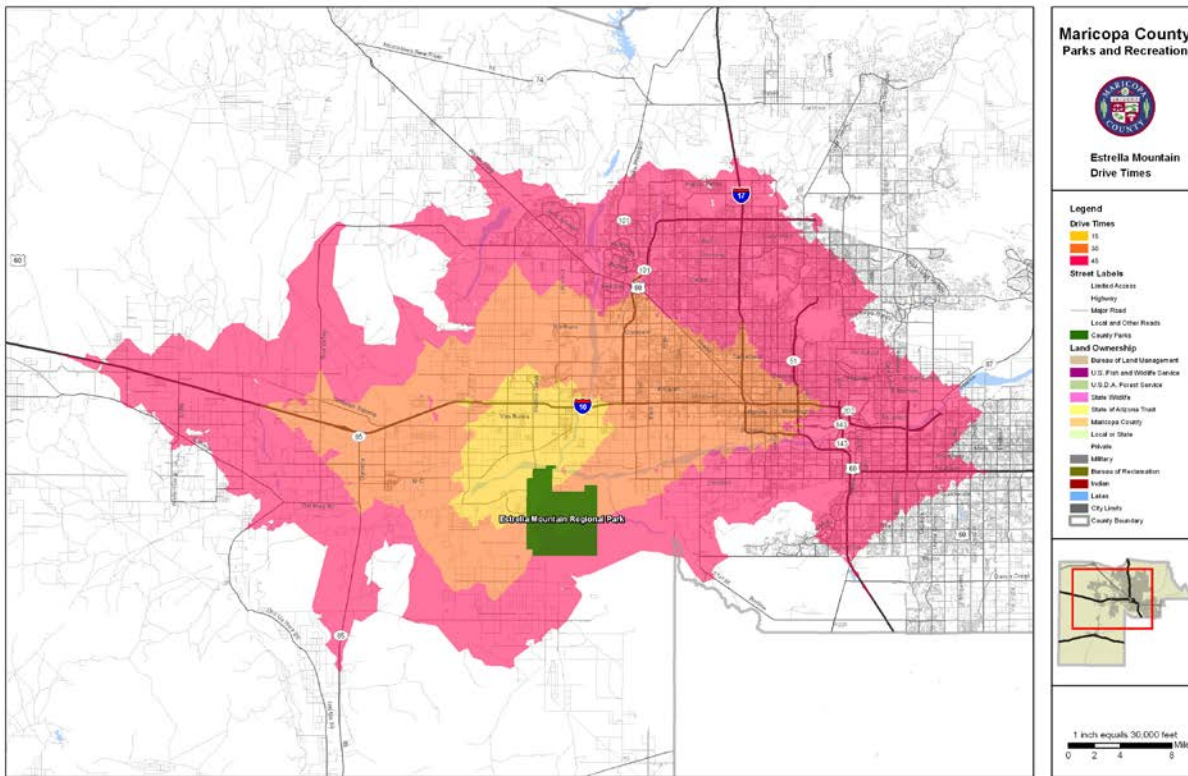


Figure 4-2: Drive time analysis (Source: 2009 Strategic System Master Plan, PROs Consulting, page 52)

4.2 Proposed or Planned Roads, Access, and Parking

Current land use designations adjacent to the park are mostly residential. However, with any level of development roadways are required to serve the residents and businesses. With the predicted level of development in this part of the valley, the park and the Department should remain aware and involved with each appropriate jurisdiction to influence or guide roadway development to the extent possible. Roads that run parallel to park boundaries are not preferred as they tend to provide nearly unlimited and uncontrolled park access and increase the opportunities for illegal park access. Parallel roads also serve as a barrier to wildlife and other biological movement patterns.

4.2.1 Proposed or Planned Roads

Goodyear

The City of [Goodyear Transportation Master Plan](#), a component of its 2025 General Plan, outlines its desired future road network. The City plans for an arterial roadway⁷ network along the park’s southern boundary (Pecos Road alignment) as well as a parkway west of the park’s boundary (Cotton Lane alignment).

⁷ City of Goodyear, Transportation Master Plan (Final Draft), Chapter 3, Page 29, Figure 3-10 Future Functional Class (South). <http://www.goodyearaz.gov/home/showdocument?id=9854> as accessed August 1, 2014.



The City also identified Estrella Parkway⁸ as in need of a traffic signal and widening to accommodate future traffic demands. The Department asked MCDOT to analyze internal park roads and the external roadway network near the park. A recommendation from their analysis provided several alternatives⁹ to improving this intersection; the most cost effective alternative being a restriping of the road and realigning of the guardrail (Option 4a) to allow additional space for a left turning lane from Estrella Parkway to Vineyard Avenue.

Avondale

The [City of Avondale Transportation Plan](#)¹⁰ (November 2012) proposes to expand the Dysart Road alignment into a four to six lane arterial at least as far south as the park boundary. The City's Transportation Plan also recommends upgrading Indian Springs Road into a four to six lane arterial road.

The City has a long term goal of extending Dysart Road through the interior of the park and mountains to reach the southern extent of their City planning area. This extension of Dysart Road into the interior of the park is neither supported nor desired by the Department.

MCDOT

In July 2014, Maricopa County Department of Transportation (MCDOT) began the process to update the countywide Transportation System Plan; once complete, this document will outline the vision for the planning and construction of transportation facilities through the year 2035. MCDOT and its consultant(s) are also conducting feasibility studies on the following parkway proposals in the west valley:

- SR 303L / Cotton Lane extension (west of park boundary, a MCDOT and/or ADOT project);
- Hassayampa Freeway: the study area is approximately 41.2 miles and extends from the north to the Gila River, although this may be incorporated into I-11 development.

ADOT

Arizona Department of Transportation (ADOT) (in cooperation with Nevada Department of Transportation and its consultants) began a study in October 2012 to determine feasibility of [Interstate 11](#) (I-11), a multi-modal transportation corridor connecting the Phoenix metropolitan area to Las Vegas, Nevada. Per the I11 Study website, ADOT is commencing a Tier I Environmental Impact Statement (EIS) and Conceptual Engineering Document¹¹ in order to select a preferred corridor (approximately 2,000 feet wide) and a preferred transportation mode to accommodate future traffic demand from Nogales to Wickenburg. ADOT will comply with National Environmental Policy Act (NEPA) guidelines and will engage and involve affected agencies, organizations, and members of the community as a part of the Tier I EIS document. The Department and the park should continue to monitor its progress and be aware of any management impacts.

ADOT is also actively reviewing the expansion of SR30 (intended to provide relief to Interstate 10 and a potential tie-in to the Loop 303 and Loop 202 freeway expansions). As of publication of this master plan

⁸ City of Goodyear, Transportation Master Plan (Final Draft), Chapter 4, Page 56-57.

<http://www.goodyearaz.gov/home/showdocument?id=9854> as accessed August 1, 2014.

⁹ Estrella Mountain Regional Park Master Plan Final Roadway Evaluation, Section 4.6, September 2015.

¹⁰ City of Avondale, Transportation Plan <http://www.avondale.org/documentcenter/view/31342> as accessed October 30, 2015.

¹¹ I-11study, <http://i11study.com/index.asp> as accessed December 3, 2015.



update, ADOT continues to evaluate four alternatives including a no-build alternative for SR30.¹² Construction of the Loop 202 freeway, also known as the South Mountain Freeway, may facilitate access to the park for visitors coming from the south by connecting to I-10, depending on exit ramp locations.¹³

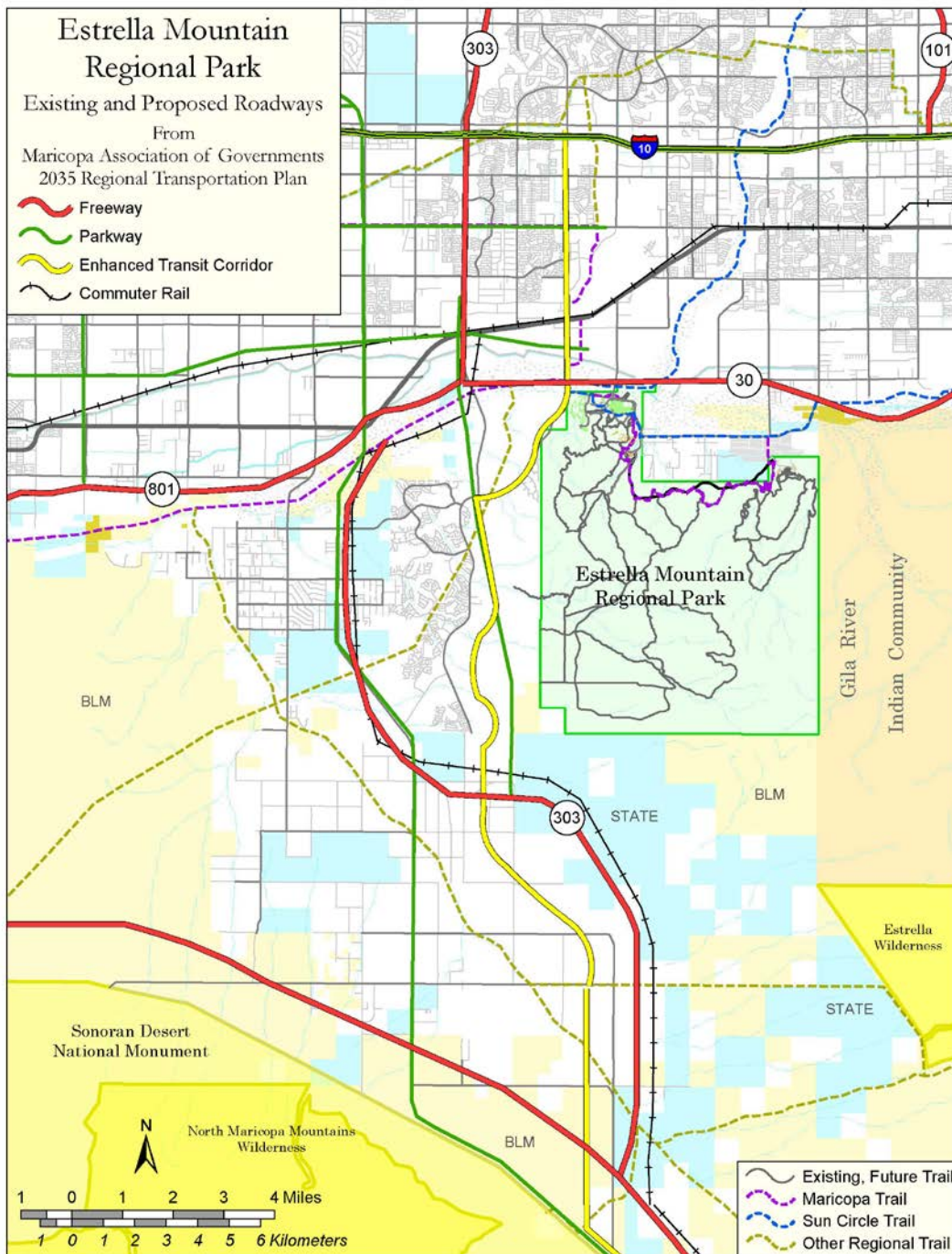


Figure 4-3: Existing and Proposed Roadways (source: MAG)

¹² ADOT, <http://azdot.gov/projects/phoenix-metro-area/state-route-30> as accessed October 30, 2015.

¹³ ADOT currently estimates construction to begin in the summer of 2016 and open for travel in 2020.



The Maricopa Association of Governments (MAG) document [Interstate 10 – Hassayampa Valley Roadway Framework Study](#) or its update provides more detail regarding many of these roadways. All of these roadway expansion projects (and others as they are identified) should be tracked by the Department and the park itself so that park management pressures or impacts can be addressed.

4.2.2 Future Access Points

The MCDOT study recommends one additional vehicular entry point between the Baseline and Indian Springs Road alignments.¹⁴ An access point in this location will allow RV traffic to bypass the main entry (and potential youth sports field traffic) and proceed directly to existing and proposed camping at the rodeo arena area.

The MCDOT study briefly looked at alternative golf course access points.¹⁵ Should future traffic volumes become significant enough to hinder the existing golf course access, the park should commence a more detailed feasibility study of alternate golf course access points.

The Department has a specific decision making protocol to follow when deciding when and where to install a new access point. The protocol involves looking at all aspects of the access point and may require its own and separate public involvement. The City of Goodyear's 2014 Parks Recreation Trails and Open Space Master Plan¹⁶, a component of its 2025 General Plan, identified its preferred access points to the park. Similarly, adjacent residents sometimes request access within neighborhoods. However, in all cases, the park will follow the Department's access matrix protocol to determine which of these preferred entry point locations may be suitable for the park.

Based on the City of Goodyear identification of arterial roadways and access points at the park's southern boundary, the park should consider developing a southern park entrance point that can accommodate both vehicles and non-motorized park visitors should these arterials become a reality. A master plan amendment or a new master plan should be considered in the event the southern boundary becomes accessible so that additional needs and potential impacts that are not apparent today may be fully measured.

4.2.3 Future Internal Park Roads and Parking Lots

The Park Road System Guidelines/Standards should be followed when park roads require extensive maintenance or as new roads are designed and developed. All roadway classifications are adequate to accommodate the design vehicle - a motorhome with a boat trailer.

Future actions should include correcting the design deficiencies noted in the MCDOT study. Additionally, an alternate road from approximately the rodeo arena to the competitive track should also remain near the top of roadway priorities. As previously mentioned, when PIR holds events, the competitive track area is inaccessible to the public; by having an alternate route, the competitive track can be put to beneficial use and not be completely closed off to the general public. A new roadway to the competitive track could also open some portions of the park to primitive or tent camping opportunities. The MCDOT

¹⁴ Estrella Mountain Regional Park Master Plan Final Roadway Evaluation, Section 4.6.5, page 21-22, September 2015.

¹⁵ Estrella Mountain Regional Park Master Plan Final Roadway Evaluation, Section 4.6.5, page 27, September 2015.

¹⁶ City of Goodyear, Parks Recreation Trails and Open Space Master Plan, July 2014, figures 14 and 15. <http://www.goodyearaz.gov/home/showdocument?id=13071> as accessed December 30, 2015.



study briefly looked at a potential roadway alignment (figure 4-3). This alignment is approximately four miles and crosses several washes and mountainous terrain. This alignment crosses the adjacent State Land Trust property. The alignment shown is conceptual only and it should be noted that additional study is required to examine this or other internal park roadway options.

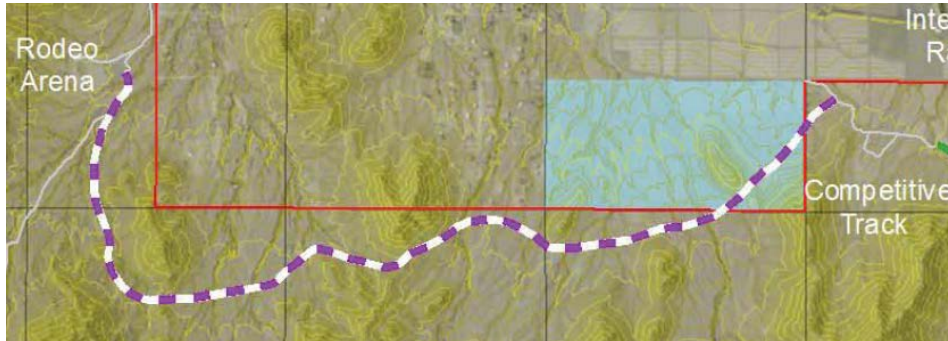


Figure 4-4: Potential internal park roadway (Source: MCDOT study, figure 24, p29)




Improvements to the combined service road (sometimes labeled Riverhawk Road) and Coldwater Trail are also recommended so that the Coldwater events area may be used as a formalized trailhead and parking lot. Scenic pullouts and/or walk-in tent sites are recommended on either side of this road.

As new amenities are added to the park, adequate parking should also be incorporated into its site design. Some existing parking lots can be expanded or realigned to accommodate future parking needs. Likewise, the multipurpose sports field development proposal must take parking needs into account in their site design in order to accommodate its players and spectators. As trail use continues to increase in popularity with park visitors, trailhead parking must also be evaluated. Some trailheads may require additional parking.



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Trail Rating Guide		During the hotter months when the temperature and or humidity is high, trails will be rated at least one level higher		
Rating Symbol	Brief Definition	Surface	Grade	Obstacles /Steps
 easiest	Paved Accessible Trail	Paved or hard and smooth	 	None

CHAPTER 5 – TRAILS

The trails chapter details the existing trails within the park. The trail system is a vital component of the park and provides park visitors with diverse recreational experiences from educational interpretive trails to rugged mountain hikes. The Estrella Regional Park Trail System Plan (Appendix J) was adopted in 1998 and amended in 2012 (figure 5-1). The Trail System Plan (and amendments) describes the desired future condition of the trail system, including trail access points and service road access, and prescribes actions to achieve the planned condition.

This master plan update will provide conceptual trail recommendations (found in Chapter 7) based on public feedback received during the open public comment phases; it will then delegate the specific trail alignment planning to the park’s Trail System Plan. Additional trails or deletions to the trail system may require an amendment to the Trail System Plan; the trail development planner/manager is tasked with making that determination and implementing the amendment process, if required.



Figure 5-1: Pedersen Trail, Trails Crew at work.

All trail alignments must be incorporated into the Trail System Plan prior to construction and are not considered authorized trails until that time regardless of their mention in this Master Plan update. In areas where this Master Plan update is silent, the Trail System Plan prevails. The Trails Management Manual provides further detail on Policies, Standards, and Guidelines for Planning, Design, Construction, and Maintenance of the Trails and Tracks System in Maricopa County Parks.

5.1 Existing Trails

Estrella Mountain Regional Park offers approximately 30 miles of shared-use trails, ranging in length from 0.25 mile to 6.1 miles (figure 5-2). Trails are rated from easy to strenuous and include two diamond-rated trails (table 5-1). In addition, there are 0.5 miles of barrier-free trails.

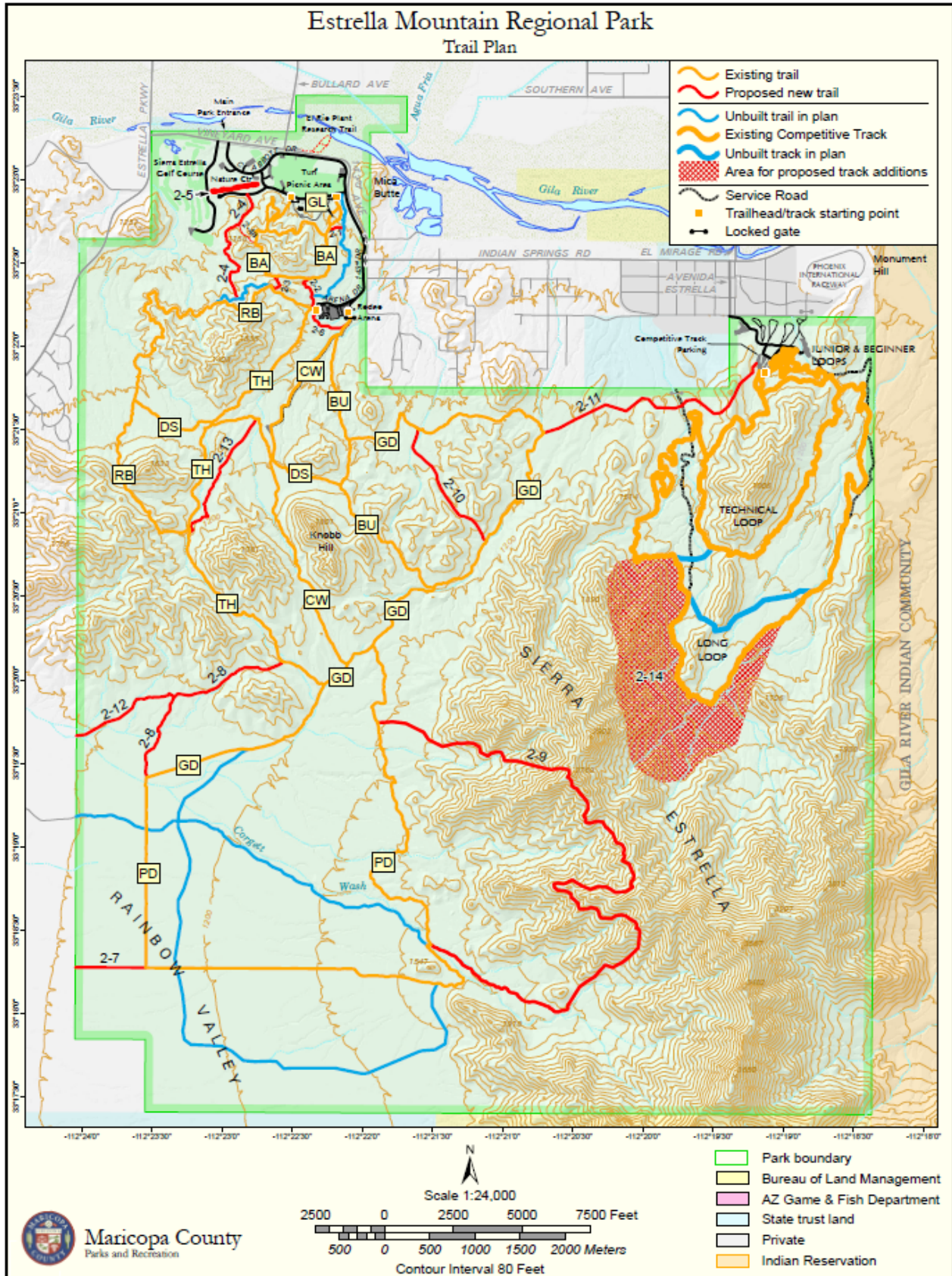


Figure 5-2: Trails (existing and proposed)



Table 5-1: Designated Trails					
Name	Miles¹	Kilometers¹	Notes	Rating²	Management Classification
Baseline	2.6	4.2	Hike only, round-trip		Primary
Butterfield (front)	0.8	1.2	Shared use		Primary
Butterfield (back)	1.3	2.3	Shared use		Primary
Coldwater	2.9	4.7	Shared use		Primary
Dysart	1.9	3.1	Shared use		Primary
Gadsden	6.1	9.6	Shared use		Primary
Gila	0.5	0.7	Barrier-free, round-trip		Barrier-free
Pedersen	6.8	10.9	Shared use, loop		Primary
Rainbow Valley	4.2	6.7	Shared use		Secondary
Toothaker	3.7	5.9	Shared use		Primary
Saddle	0.3	0.5	Shared use		Secondary
Horseshoe	1.0	1.6	Shared use		Primary
Homestead	2.4	3.9	Shared use		Primary
Crossover	0.9	1.5	Shared use		Secondary
Competitive Track	Total tread length				
Long Loop	9.5	15.3	Distances are round-trip from trailhead		Competitive Track
Technical Loop	4.7	7.6	Distances are round-trip from trailhead		Competitive Track
Junior Loop	1.6	2.6	Distances are round-trip from trailhead		Competitive Track
1 Distances may have been rounded 2 Rating symbols are defined in Table 4-3 below or online at http://www.maricopa.gov/parks/trailrating.aspx					

5.1.1 Competitive Track

The park offers an approximately 15-mile Competitive Track in addition to its trails. The Competitive Track is designed to provide challenging, strenuous, and high-speed outdoor recreation for individuals, groups, and organized events. The Competitive Track is designed multiple-use for cross-country runners and joggers, fast bicyclists and racers, and trotting/galloping equestrians and endurance riders. The track may be closed to general use while organized events are taking place. Large events, like the Cactus Flower Women’s Trail Race, may attract over 400 participants. Other events or races may bring 50 to 350 participants to the park (table 5-2). The track has an ample parking area that can accommodate 50 to 100 vehicles. (The parking area may also be used as overflow camping for Phoenix International Raceway attendees when needed.)

Table 5-2: Competitive Track Events and Participants		
Fiscal Year	Number of Events	Participants/Spectators
2010-11	4	850 / 165
2011-12	3	750 / 250



2012-13	3	750 / 250
2013-14	3	900 / 300
2014-15	6	1,250 / 400

5.1.2 Maricopa Trail

The Maricopa Trail (and Sun Circle Trail) has planned connection(s) to the park (future Beaver Trailhead) within its “Priority One” construction. The trail is part of a regional trail plan that will link all Maricopa County regional parks and will provide connections to metropolitan areas, municipal trails, communities, and neighborhoods with regional non-motorized multi-modal corridors. It will also provide an outlet for competitive hikers and bicyclists seeking long distance routes.

5.2 Proposed Community Trails/Trailheads

The City of Goodyear’s Parks and Recreation Master Plan¹, a component of its 2025 General Plan, outlines its desired future trails/paths, trailheads, and access points to the park. Any future updates to the park’s Trail Plan should take these desired locations into consideration and perform the Access Matrix process to determine the precise location, suitability, and public benefit of adding an access point.

5.3 Trail Use

All trails are shared-use unless otherwise designated. All trail users are encouraged to practice proper trail etiquette. Park Rule R-118 requires hikers, equestrians, and bicycle riders to remain on designated trails and shortcutting by any type of trail user is prohibited. Trail education and, if necessary, law enforcement will be used to attain compliance. Signs will be posted and barriers constructed at obliterated paths, roads, and undesignated washes if use is continued after closure.

The 2012-2013 ASU Park Visitor Study shows that park visitors use trails for an average of 4.14 miles². When singled out by the visitors’ primary activity, other trail uses include (table 5-3):

Primary Activity	Percent of Visitors ¹	Miles of Trail Used ²
Trail hiking	73.7%	3.62
Mountain biking	7.3%	9.83
Picnicking	7.3%	2.08
Running/jogging	3.7%	9.17
Horseback riding	1.5%	5.67
Walking for pleasure	1.5%	1.50

1. 2012-2013 ASU Park Visitor Study Final Report, Table 1.9A, page 23.
2. 2012-2013 ASU Park Visitor Study Final Report, Table 1.10, page 26.

¹ City of Goodyear, Parks, Recreation, Open Space, Trails Master Plan (July 2014), Supporting Elements of the System, Trailheads and Access (North), Figure 16, Page 55

<http://www.goodyearaz.gov/home/showdocument?id=9852> as accessed August 1, 2014.













² 2012-2013 ASU Park Visitor Study Final Report, Table 1.10, page 26.



5.4 Trail Rating

In 2012, a partnership of metro-area park agencies developed a trail rating guide to assist trail users in assessing what trails are best suited for their abilities (table 5-4). During the hotter months when the temperatures and/or humidity are high, trails are rated at least one level higher.

Table 5-4: Trail Rating Guide

Rating Symbol	Brief Definition	Surface	Grade	Obstacles/Steps
 Easiest	Paved Accessible Trail	Paved or hard and smooth		None
 Easy	Mostly smooth and wide	Dirt with occasional unevenness		2" or less, rocks and ruts
 Moderate	Mostly smooth, variable width	Dirt with occasional unevenness		<8" rocks and ruts, loose material
 Moderate difficult	Mostly uneven surfaces	Dirt and rock		<12" rocks and ruts, loose material
 Difficult	Long rocky segments with possible drops and exposure	Dirt and loose rock with continual unevenness		12" or taller, loose rocks, exposure to drops
 Extremely difficult	Long rocky segments with possible drops and exposure	Dirt and loose rock with continual unevenness		12" or taller, loose rocks, exposure to drops and excessive heat >90F



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CHAPTER 6 – MANAGEMENT ZONING

The foundation for the management zones is found in the Maricopa County Parks and Recreation Department 2009 Strategic System Master Plan, June 2009 (page 105-116), and is presented again here (table 6-1). It should also be noted that the Strategic System Master Plan also recommends that the size of all developed areas should be limited to 10% of the overall park size; however, smaller parks that are adjacent to other protected open space may exceed that 10% recommendation. As of 2009, the park has about 2.3% of its total acres developed; however, that is expected to increase slightly as new projects or trails are constructed.

Table 6-1: Management Zone and Acreage	
Zone	Percent of Total Park Acres
Development	2.3% (463.00 acres)
Trail	1.4% (274.64 acres)
Semi-Primitive	31.3% (6,200.10 acres)
Primitive	58.2% (11,528.44 acres)
Perimeter Buffer	6.8% (1,336.97 acres)
Non-Management Zone	0% (0 acres)

Source: 2009 Strategic System Master Plan, page 110.

6.1 Methodology for Determining Management Zones

The current management zoning descriptions and maps used for Estrella Mountain Regional Park are taken directly from the Maricopa County Parks and Recreation Department Strategic System Master Plan, June 2009 (pages 105-116), as prepared by PRO's. The zones were determined based on existing use and location of developed features. These management zones are meant to provide some flexibility. If/when development occurs on the north, south, or west side of the park, the development zone in those areas will require review and possibly changed.

The park was zoned according to existing use which may or may not be its preferred future use; as such, future revisions of these zones should include descriptions of the desired visitor experience and level of intended management. For example, one zone may provide the visitor with a sense of wilderness and remoteness, challenging their outdoor skills. This zone would thus require a low level of management and a high level of resource protection and may be labeled as "primitive" and should reflect the desired future conditions of the park rather than existing use or conditions.

6.2 Description of Management Zones

The following chart (table 6-2) describes the zones that are areas of land-based management only and are designed to be a working document so that some flexibility of the classification of each is allowed.



Zone (Management Level)	Description	Includes, but not limited to:
Development (Highest)	<p>Includes areas which require the highest level of management. These areas contain the largest level of park activity by visitors.</p> <p>When possible, this zone should not exceed 10% of overall park size. Smaller parks that are contiguous to other protected open space may exceed 10%.</p>	<p>Roads</p> <p>Golf courses</p> <p>Archery/shooting range</p> <p>Model airplane</p> <p>Sports fields</p> <p>Aquatic complex</p> <p>Restroom facilities</p> <p>Picnic areas and ramadas</p> <p>Camp sites</p> <p>Equestrian facilities</p> <p>Entrance stations</p> <p>Visitor centers</p> <p>Trailheads</p> <p>Parking lots</p> <p>Boat launch areas</p> <p>Amphitheaters</p> <p>Group areas</p> <p>Staging areas</p> <p>Park offices</p>
Trail (High)	<p>This zone requires a level of management second only to development zones. These areas are limited to passive recreation and park maintenance only. In most cases, public vehicular access is restricted.</p> <p>Hiking trails and their connectivity to adjacent land uses makes up the majority of this zone.</p>	<p>Park access gates</p> <p>Shared-use trails</p> <p>Barrier-free trails</p> <p>Hiker-only trails</p> <p>Regional system trails</p> <p>Competitive tracks</p> <p>Service roads</p> <p>Public roads (with no connectivity to developed management zones)</p> <p>Unpaved roads</p>
Perimeter buffer (Fairly high)	<p>This area includes areas along the park boundary and adjacent to varying land uses. Park security and limiting external connectivity are the goals of this zone.</p> <p>Due to encroaching development at several parks, the management required for this zone can be fairly high.</p>	<p>Fencing</p> <p>Access gates</p>
Semi-primitive (Low)	<p>This zone includes areas adjacent to and between other management zones which contain few amenities. These areas should act as a transition between zones of high and low management.</p> <p>Typically contain minimal impact activities and provide a “back country experience”. The</p>	<p>Back country areas</p>



	management required for this zone is very low.	
Primitive (Lowest)	<p>Encompasses the areas which are considered remote and inaccessible. Included, are areas which the terrain is too rugged for vehicular or pedestrian traffic as well as areas that are a great distance from any other “developed” zone without a point of access.</p> <p>The key element of this zone should be wildlife conservation and preservation. Access to this zone is available only by special permit (i.e. wildlife study) and therefore requires the least amount of management.</p>	Wildlife areas

6.3 Area Descriptions that Influence Park Zoning

Topography or natural and cultural resources may determine the areas that are considered semi-primitive and primitive. Many areas are too rugged for any type of development and therefore semi-primitive or primitive are inherently appropriate in a large portion of the park.

The 2009 Strategic System Plan (page 110) notes that current management zones reflect existing land uses within the park (figure 6-1). As future connectivity and access needs change, these zones will require an update.

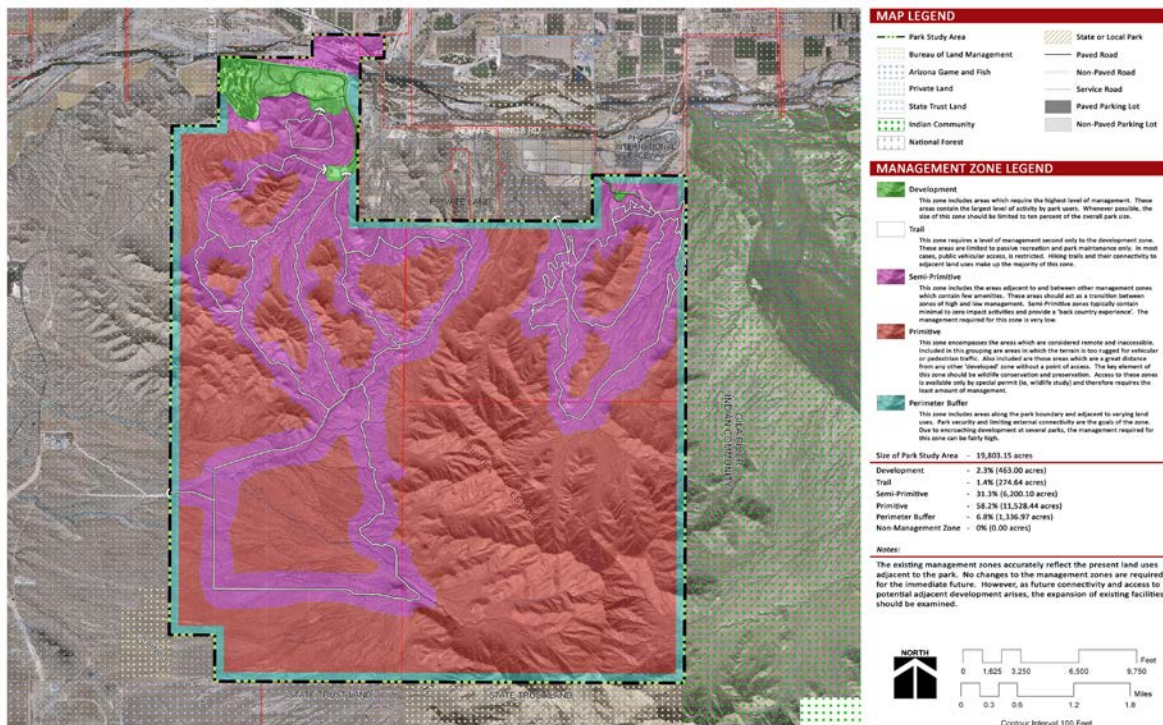
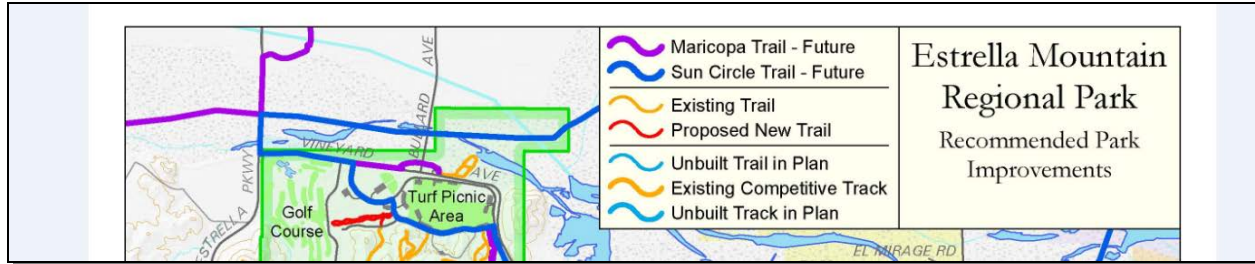


Figure 6-1: Development Zones (Source: MCPRD 2009 Strategic System Master Plan, Figure 41, p 110)



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CHAPTER 7 – PARK IMPROVEMENT PROJECTS

This chapter identifies new park improvement projects that have been determined through the planning process. This process included analyzing existing conditions, trends, public input, consultation with neighboring agencies, and Department staff expertise as described in previous chapters. Staff, stakeholders, and the public were presented with two draft alternatives (Appendix K) and asked to comment and provide input on each. The results of all comments and feedback indicated that draft alternative B was most preferred. The recommended park improvement projects presented herein best align with draft alternative B with additional edits for clarity.

This master plan update will continue to uphold the concept of “active use area” by streamlining the 1988 Long-Range Master Plan objectives by:

Supporting existing features and amenities:

This plan update recommends supporting amenities to existing areas and promotes educational components of the park, such as:

- Upgrades and repairs to existing facilities (e.g. Super Playground and restrooms);
- Active recreation areas such as sports fields;
- Improved signage and maps; and
- Incorporating El Rio and a wetlands/water feature with educational opportunities within each.

Limiting other features:

This plan update streamlines the quantity of built facilities to protect its natural and cultural resources. Other developed features outlined in the 1988 Long-Range Master Plan that are not currently in place or recommended within this update are not desired facilities for the park.

7.1 Issues and Constraint Analysis

The planning team met early in the planning process to discuss issues that may place constraints on the park. The plan update will make every attempt to address those items discussed within its improvement projects and operations (table 7-1), such as:

Issue/Constraint	Analysis
Land ownership	The various means of land acquisition may also bring limitations to land development or use.
Access	Adjacent private land ownership and/or rugged landscape bring limitations to the park staff being able to access remote locations.
Management Zones	Management Zones represent existing land use. Additional development actions must complement its zone or modify the zone. The Management Zone should reflect the desired use and visitor expectation for that zone. Some proposed projects may require a



	zone change.
Rugged landscape	Prevents development or access to some areas.
Wildlife corridors/linkages	MCPRD has consulted with AZGFD to locate known corridors/linkage patterns. Any future development will be sited in locations that will accommodate linkages.
Hunting	Designated areas of the park can fill this niche other areas cannot; as regulated through AZGFD.
Compliment established themes	All efforts have been made to compliment park's theme(s) of <i>El Rio</i> and <i>destination</i> park.
Neighboring city/town development patterns	The Park Supervisor and/or Park Planner routinely participate with neighboring agencies regarding development patterns.
Maintain development to under 10% of land acres	Currently, 2.7% of land acres are considered developed; park is well within the 10% limit. Future development actions will need to take this guideline into account and repurpose previously disturbed ground to the extent feasible.
Operations	The park has had visitor declines and revenue declines for several years; these improvement projects are intended to increase revenue and diversify what amenities the park offers.

7.2 Recommended Park Improvements

These park enhancements adhere to the MCPRD vision and mission. These enhancements also address the park's priority mandates and promote the park's theme. The park improvements and features detailed in the section were based on public input, stakeholder advisory group suggestions, and park staff's knowledge, experience, and guidance from other planning documents (figures 7-1 through 7-2, and table 7-2).

A timeline for completion was not assigned to any one project as any one may be completed as the opportunity presents itself. Projects will be scheduled through the Department's Capital Improvement Plan and potential costs and funding sources will be identified through the Implementation Plan. However, a priority level was assigned to show which projects may be of a relative greater need than another:

- **High Priority:** projects that are in progress; public health or safety issues; resource protection.
- **Medium Priority:** important, but not a matter of public health or safety; to indicate a desired level of service across a range of recreation opportunities.
- **Low Priority:** desired features; or dependent on long-term partnerships or other considerations.

A majority of these projects will be phased in individually over multiple years to maximize budgetary resources, build partnerships with other agencies, and to minimize impacts to park operations and resources. Site specific plans (including any applicable natural or cultural resource inventories and clearances) and engineering plans will be required for new construction. The Implementation Plan and an annual Business Plan will help identify which projects will be funded at that time. *All of these improvement projects are contingent upon having adequate funding and staffing resources to implement.*

Many of the park's facilities were developed with Land Water Conservation Fund (LWCF) grant monies. Any substantial changes to such facilities should require a consultation with the LWCF administrator at Arizona State Parks to ensure program compliance. Similarly, R&PP land areas may also require BLM consultation prior to development and implementation.



For the purposes of this Master Plan update, the mapped location of any new facilities herein is conceptual only; the precise location may change due to engineering feasibility and resource management issues. Additional public meetings regarding individual projects may be required and the results of which may shape the final outcome of the project.

Additionally, any new trail or road alignments shown in these park improvements are also considered conceptual only. The locations are general corridors and not intended to be precise; new trails or roads will be located according to MCPRD trail standards and area topography. These alignments are not open to travel until they have been properly constructed, posted, and designated by MCPRD. Traveling on undesignated routes causes damage to the land, may be hazardous, and is in violation of park rules.

As a result of public input, agency partner input, and staff expertise, this plan update recommends the following park improvement projects:

Based on all public and stakeholder comments received throughout the entirety of the planning process, draft alternative B was the most preferred and offered the most benefits to the park and its visitors. Draft alternative B was further refined and is presented below in its final and recommended form.

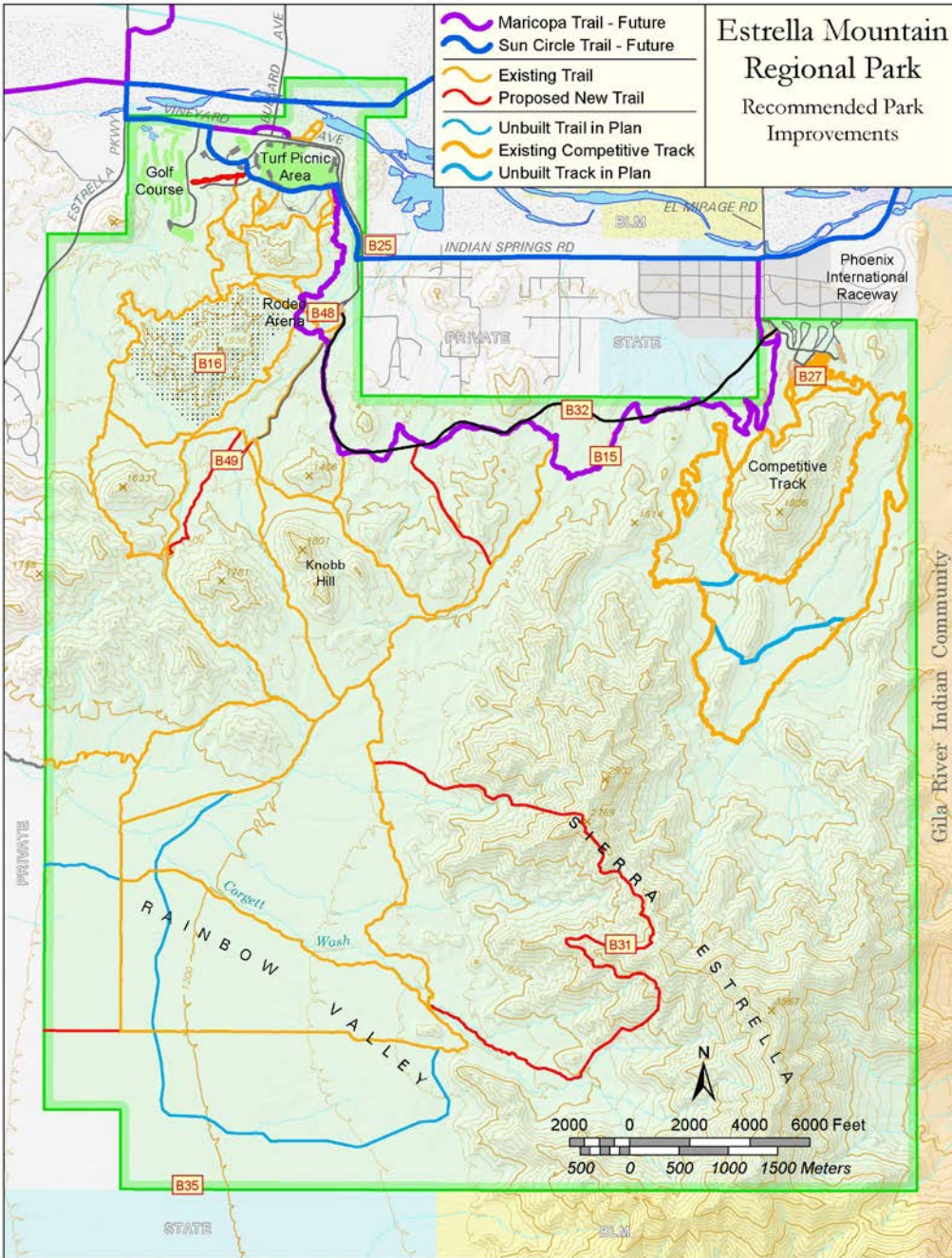


Figure 7-1: Recommended Park Improvements (entire park)

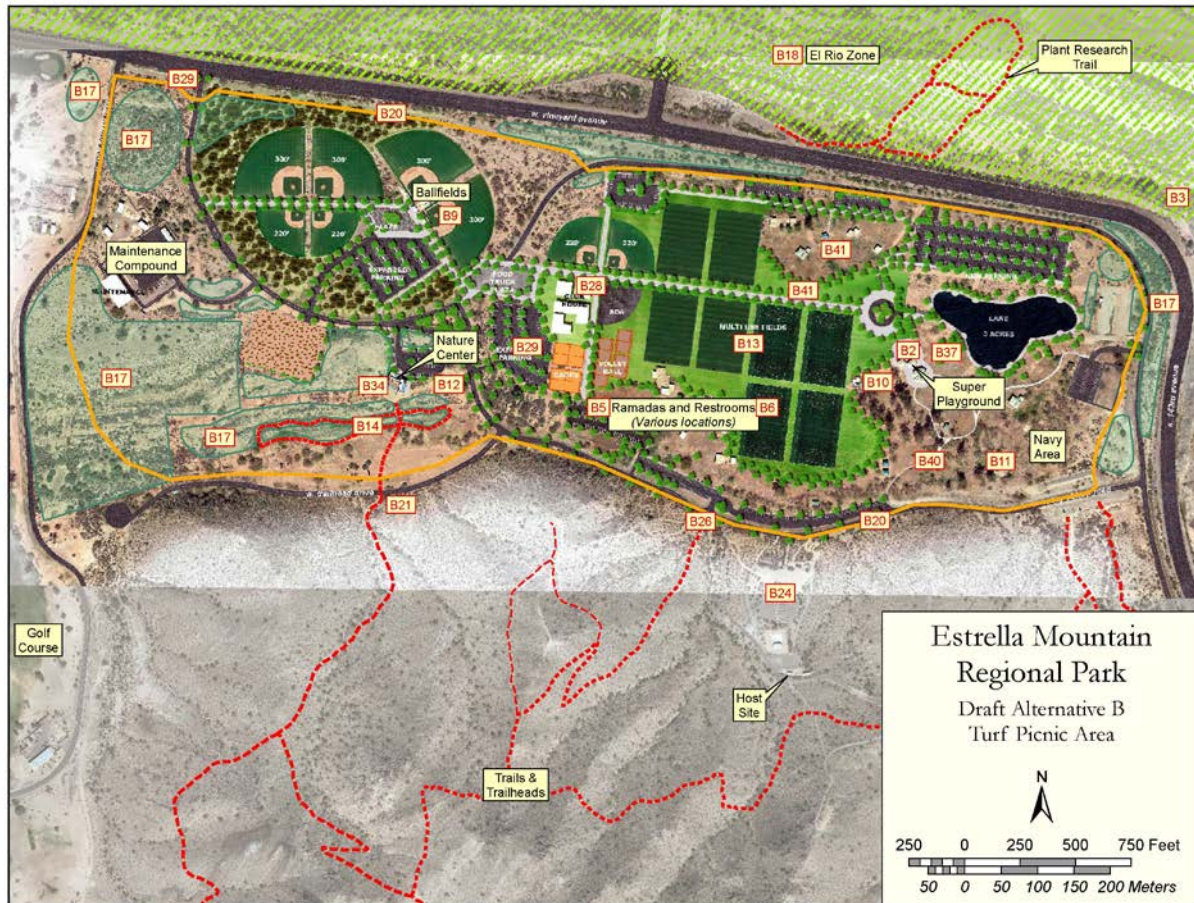


Figure 7-2: Recommended Park Improvements (north area close-up)

Table 7-2: Recommended Alternative				
ID#	Location	Description	Priority	Acres of new ground disturbance (Approx)
B1		Existing park features including: Nature Center Maintenance Compound Host Sites Super Playground Ramadas Restrooms Trails / Trailheads Horse rental area Comp Track Golf course Navy Day Use Area Ball fields		
		Maintain/Rehabilitate Existing Facilities		
B2	Super Playground	Continue with planned improvements and equipment upgrades. Install interpretive signage.	High	n/a



B3	Gila River corridor	Install “no parking” signage at Vineyard Avenue curve in road and roadsides. (Legal parking is located at Plant Research Trail parking lot.)	High	n/a
B4	Park-wide	Domestic water main replacement to stabilize water distribution.	High	n/a
B5	Ramadas	Renovate existing or develop new ramadas to include updated electrical and water.	High	n/a
B6	Restrooms	Renovate existing restrooms and/or construct new restrooms. Demolish crumbling restrooms and replace with new or expanded restrooms in an area with greater need (area of greater need is TBD pending other improvements).	High	n/a
B7	Park-wide	Explore costs and feasibility of sewer hookup to City of Goodyear and/or expanding and replacing existing septic systems.	High	n/a
B8	Roads	Existing roads: Maintenance is on a routine schedule and should be coordinated with other park upgrades to minimize impacts to park visitors.	High	n/a
B9	Ball Fields	Renovate existing ballfields: may include improvements to turf, restroom, fencing, lighting, existing parking. (Most closely corresponds to Phase 1 of EYS plan)	Medium	n/a
B10	Near Super Playground	Screen and shade pumping station area from visitors view. This will also protect the machinery from sun damage.	Medium	n/a
B11	Navy Area	Realign the approximately 4 acre picnic area to include both ramadas and open picnic tables. Use desert landscaping and pathways/roads to define area. Replace worn or broken grills and fire pits. Day uses only; no overnight use.	Medium	n/a
		Develop New Facilities		
B12	Near Nature Center	New amphitheater constructed near Nature Center (approximately 75x75 square feet). To include a trail or pathway from Nature Center to site; distance of this trail/pathway may vary depending on final location of amphitheater.	Medium	n/a
B13	Turf area	Install up to 8 multipurpose sports fields/open space; final number dependent on market demand and needs assessment. (Most closely corresponds to Phase 2 of EYS plan)	Medium	n/a
B14	Trails	Centennial Trail – install trail just behind Nature Center; to feature barrier-free and pedestrian only access; may include public art, interpretive panels, or other trail amenities.	Medium	n/a
B15	Trails	Install a Maricopa Trail connection near the existing Competitive Track. This trail will be built in cooperation with the Maricopa Trail and M CPRD trails crew.	Medium	tbd
B16	Trails	Provide a peak view trail: A trail that spurs off of the Rainbow/Toothaker/Dysart trails will provide a peak view and be located within a distance that most hikers can travel in a couple hours round-trip and remain close to existing facilities.	Medium	tbd
B17	North park area and golf course	Brine wetlands: 30-40 acres as designated via Parks/Goodyear/BOR partnership. May include a 3-5 acre blending pond at east turf area, service roads and berms. Additional public meetings or input may be required.	Medium	n/a
B18	Gila River corridor	As a cooperative effort with Flood Control District of Maricopa County, City of Goodyear, City of Avondale, and others, to implement the El Rio Watercourse Master Plan and related	Medium	tbd



		documents or projects for riverbed restoration and recreation elements. <i>Additional public meetings or agency input may be required on a project by project basis.</i>		
B19	Roads	New roads and/or upgrades; future road improvements may include: expand entrance lane widths; bicycle lane installation; improving dips; etc., scenic loop/pullouts; loops to ramadas, picnic areas, or campgrounds; road to competitive track. Additionally, recommendations from the MCDOT park roadway evaluation (dated Sept. 2015) regarding the Estrella Parkway and Vineyard Ave intersection will be forwarded to the City of Goodyear for their consideration.	Medium	<i>tbd</i>
B20	Trails	Design a looped trail around main, northern area of park; repurpose remnants of old perimeter road to the extent possible with the final alignment to be compatible with the proposed wetlands and sports field layouts.	Medium	<i>tbd</i>
B21	Quail Trailhead	Develop trailhead may include: kiosk map and trail information and educational materials; designated path from Nature Center, public art, defined parking and crosswalk, trim/landscape vegetation. Develop the overlook with kiosk or educational materials and seating. Rename trail to reflect overlook destination.	Medium	0.004
B22	Trails	Install additional signage at trailheads, trail mileage signs, and interpretive signs along trails.	Medium	<i>n/a</i>
B23	Primitive Camping Area	A basic, walk-in style camping area. To include defined individual tent pads, grill or fire ring, and a restroom if feasible. <i>The precise location will be determined based on a future site suitability and engineering analysis and access considerations.</i>	Medium	0.05 (approx. per site)
B24	Amphitheater	Install small, modest cabins at the approximately 5.1 acre site that currently serves as an amphitheater. May include pre-fabricated cabins that provide kitchenette and HVAC. A centralized restroom/shower area may be provided.	Medium	<i>n/a</i>
B25	Access	Secondary entrance point with entry station near existing gate(s) on 143 rd Ave. This entrance is associated with campground development and/or as a relief entrance/exit point to sports field use. This entry point should include a self-pay station and a walk-in gate to accommodate equestrian, bicyclists, and hikers.	Medium	0.15+
B26	Baseline Trailhead	Develop trailhead, may include: kiosk map and educational materials; public art, trim/landscape vegetation. Consider relocating trailhead (dependent on EYS level of activity) or define parking and crosswalk for trailhead access.	Medium	0.2+
B27	Comp. Track	Upgraded staging area - features may include: technical trail (already in trails plan as comp track expansion), pump track, Maricopa Trail connection, restroom, water, shade, improved entry and kiosk signage. <i>Note that the consideration of trail reroutes out of sandy wash areas are implemented via the trails plan process.</i>	Medium	<i>n/a</i>
B28	Turf Area	Multipurpose and ballfield expansion and support facilities (to include clubhouse, batting cages, sand volleyball, ADA ballfield, parking etc.). (Most closely corresponds to Phases 2 through 5 of EYS plan.)	Medium	<i>n/a</i>
B29	Main	Create a highly visible park entrance monument.	Medium	0.0014



	Entrance			
B30	Trails	Design, build, and incorporate more challenging trails for both mountain bikers and hikers alike (akin to National and Mormon Trails at South Mountain). <i>May require Trail Maintenance Manual update prior to instigating any design, layout, and/or implementation as well as following the trail planning process for all new trail development.</i>	Low	<i>tbd</i>
B31	Trails	Included in 2012 Trails Plan and reiterated by this Master Plan Update: backcountry trail at elevation (consult with AZGFD to determine trail alignment).	Low	<i>tbd</i>
B32	Trails/ Roads	Included in 2012 Trails Plan and reiterated by this Master Plan Update: similar to B15, to provide a connector trail to competitive track. However, if the need arises, this may be upgraded to an improved road; improved roadways require MCDOT consultation and assistance. Further, this trail or road may facilitate opening certain areas to primitive or basic tent camping.	Low	<i>tbd</i>
B33	Equestrian camping site(s)	As part of RV campground development (as related to B48), include site(s) with space to assemble own corral. The park will identify and provide adequate space (16x16 square foot or 0.0118 acre minimum) adjacent to one or two campsites for a camper to assemble their own corral; based on demand, this may include constructing a permanent corral at the same camp site(s) sized 16x16 square foot minimum.	Low	<i>n/a</i>
B34	Near Nature Center	Install an approximately 0.021 acre Monarch Waystation butterfly garden near Nature Center. Collaborate with knowledgeable entities regarding plant varieties and garden layout.	Low	<i>n/a</i>
B35	Access	Formal entrance at south park boundary to coincide with the development of the City of Goodyear's planned arterial roadways. To include entry station, trail connections, ramada area, or other desired amenities.	Low	<i>tbd</i>
B36	Access	Additional access points desired by City of Goodyear or other entities will follow the process of the access matrix protocol for final determination and placement. The access matrix protocol may require additional public meetings.	Low	<i>tbd</i>
B37	TBD	Rope-course adventure area or zipline. <i>Precise area is to be determined based on engineering and site analysis. Note: Development and implementation of this project will be contingent upon consultation with BLM prior to construction.</i>	Low	<i>tbd</i>
		Resource Protection		
B38	Park-wide	Mixed-use conflict (<i>requires study</i>): Research is needed to determine the level of each type of use, the expectations for that use type, ways the park may lessen potential conflicts in order to improve the visitor's experiences, and impacts of use. These studies may be performed by MCPRD staff or with the assistance of an educational institution or other knowledgeable entities. Research methods may include visitor survey, field monitoring, literature review, aerial photography comparison, or other methods.	High	<i>n/a</i>
B39	Park-wide	Capacity - social, physical, environmental (<i>requires study</i>): As the most popular places in the park, these areas play host to	High	<i>n/a</i>



		hikers, bikers, picnickers, and others; differing activities may expect different experiences which may be in conflict with other uses. Likewise, a study is needed to determine how much use or how many people a given area can handle before the experience is degraded or the environment is degraded.		
B40	Turf Area	Reconfigure remaining turf areas not under development for sports fields with native desert vegetation, where appropriate. May include adding ramadas or picnic tables.	High	n/a
B41	Developed Areas	Develop and implement a tree replacement plan and program. Use flood irrigation for trees to the extent possible.	High	n/a
B42	Park-wide	Develop a Lightscape Management Plan that will outline the park's commitment to dark skies conservation and its lightscape management practices. The park will develop this plan using "International Dark-Sky Association, Dark Sky Park Program Criteria" or equivalent as its guideline.	High	n/a
B43	Park-wide	Develop a plan for conducting a species inventory/census with the advice and guidance of AZGFD or other knowledgeable entities. Once survey work is complete, this knowledge will assist the park in managing its biodiversity.	High	n/a
B44	Park-wide	Protect and/or restore park natural and cultural resources via surveys, inventories, or studies with the guidance of qualified institutions per Department standards.	High	n/a
Education/Interpretation				
B45	Park-wide	Encourage educational components related to water resources, habitat or other natural systems, and cultural and historic resources into park programs, interpretive signage, or other displays.	High	n/a
Administrative				
B46	Park-wide	Develop and improve relationships with volunteer base for trail maintenance and other park projects.	High	n/a
B47	Park-wide	The park shall continue to engage with and build upon past success with Citizens for Estrella Mountain Park. The park should also seek out their assistance for minor park improvements, educational events, and park advocacy when appropriate.	High	n/a
B48	Rodeo Arena	The park will divest itself of the rodeo arena and repurpose the area with another recreational activity that provides self-sustaining revenue. The overall redesign of this area shall take into account: <ul style="list-style-type: none"> • RV camping (approximately 12.5 acres) as the primary use • A group RV camping area of limited size and acreage • Retain existing building with restroom or remodel to the extent feasible • Concessionaire needs and facilities at the western-most portion of the area (approximately 2.5 acres) • An equestrian staging area and trail access • Enhanced trailhead access near eastern-most portion of area near existing ramada (approximately 0.5 acres) • A green space with landscaping and picnic tables as a buffer between equestrian staging area and RV camping area 	Medium	n/a



		<ul style="list-style-type: none">An entrance from the Indian Springs Road access point(s) to service this area <p><i>Note 1: The rodeo arena was constructed with LWCF grant funds and any redesign efforts require a consult and change of use report with the LWCF grant coordinator at Arizona State Parks prior to any changes.</i></p> <p><i>Note 2: Development and implementation of this project will be contingent upon consultation with BLM prior to construction.</i></p>		
B49	Coldwater	Establish this clearing as a trailhead with restroom. To enter discussions with MCDOT to improve road access; to also offer roadside pullouts for picnicking and/or tent camping. To include full utilities if feasible. Potential site for concessionaire. <i>Note: Development and implementation of this project will be contingent upon consultation with BLM prior to construction.</i>	Medium	n/a
B50	Park-wide	The park shall continue to engage with the Cities of Avondale and Goodyear, Arizona Game and Fish Department (as well as with other appropriate agencies) to develop potential partnerships. As adjacent land use designations change, it's critical to form these partnerships early.	Low	n/a
B51	Trails	Install air pump stations for bikes at key trailhead locations	Low	n/a



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Maricopa County
Parks and Recreation