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DRAFT Palo Verde Regional Park Cooperative Recreation Management Area Master Plan



Non-motorized Trails

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October 2016



PALO VERDE REGIONAL PARK COOPERATIVE RECREATION MANAGEMENT AREA MASTER PLAN

DRAFT

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ACRONYMS

| | |
|---------|--|
| ACEC | Area of Critical Environmental Concern |
| ADOT | Arizona Department of Transportation |
| AGFD | Arizona Game and Fish Department |
| AST | Arizona State Trust |
| ATV | all terrain vehicle, see note below |
| BLM | Bureau of Land Management |
| CCA | Candidate Conservation Agreement |
| CIP | Capital Improvement Plan |
| CMA | Cooperative Management Agreement |
| CRMA | Cooperative Recreation Management Area (or study area for this project) |
| FEMA | Federal Emergency Management Agency |
| FIRM | Flood Insurance Rate Panels |
| GIS | geographic information system |
| GLO | General Land Office |
| HDMS | Heritage Data Management System |
| LR 2000 | BLM's Land & Mineral Legacy Rehost 2000 System |
| LSDA | Lower Sonoran Decision Area |
| MAG | Maricopa Association of Governments |
| NRHP | National Register of Historic Places |
| OHV | off-highway vehicle, see note below |
| OS&TMP | Open Space & Trails Master Plan, Pinal County |
| PCSO | Pinal County Sheriff's Office |
| R&PP | Recreation and Public Purposes |
| R&VS | Recreation and Visitor Services |
| RAMP | Recreation Area Management Plan |
| RMA | Recreation Management Area |
| RMP | Lower Sonoran Decision Area Record of Decision and Approved Resource Management Plan |
| RAE | Recreation Activity Evaluation |
| REA | Federal Lands Recreation Enhancement Act, 16 U.S. Code Chapter 87 |
| ROS | Recreation Opportunity Spectrum |
| RV | recreational vehicle |
| SAG | Stakeholder Advisory Group |
| SCORP | Statewide Comprehensive Outdoor Recreation Plan |
| SR | State Route |
| VRM | Visual Resource Management |

Note: There are many types of and terminologies for off-highway vehicle (OHV), including 4x4, all terrain cycle, all terrain vehicle, dirt bike, four wheeler, Jeep®, quad, side-by-side, utility terrain vehicle, and many others. Arizona State Parks Department's "*Arizona Trails 2010: A Statewide Motorized & Non-Motorized Trails Plan*" as well as Arizona Revised Statutes § 28-1171 uses the term OHV to define the group as a whole. Likewise, the master plan uses the term OHV to indicate the group of vehicles and their uses, unless otherwise specifically quoted from a referenced source as a specific OHV type.

SECTION 1 – EXECUTIVE SUMMARY

1.1 Background

The proposed Palo Verde Regional Park is an area of approximately 21,900 acres, which is more than 34 square miles of mountain ranges, alluvial plains, and riparian areas owned by the Bureau of Land Management (BLM), see Figure 1-1. The proposed regional park is a small portion of the BLM's vast region known as the Lower Sonoran Decision Area (LSDA). The Palo Verde Mountains area in general is attractive to users for open space and natural resource recreation opportunities. Some of the most popular activities in the Palo Verde Mountains area include (in no particular order) off-highway vehicle (OHV) use, horseback riding, hiking, mountain biking, wildlife viewing, target shooting, and hunting. These activities are largely unstructured and there are no facilities or amenities provided by BLM. There is also very little BLM oversight or monitoring of the area. Unregulated, unauthorized, and illegal use is visible throughout the area, as evidenced by the enlargement of and growing number of shooting areas that are strewn with shell casings, shot-up saguaros, and projectile pock-marked rock outcroppings; trash dumping; uncontrolled wild cat trails; sign vandalism; cut fences; and more.



Urban growth in and towards the western Pinal County and Maricopa area has been occurring at a fast pace over the past several decades. Pinal County was the second fastest growth county in the nation between 2000 and 2010—increasing by an astounding 109 percent, from 180,000 to 376,000 people. The Arizona Department of Commerce estimates that the county will reach a population of 732,000 by 2025 and 1.3 million by 2050 (The Trust for Public Land 2012). Likewise, recreation use in the county has grown and will continue to burgeon as well.

In 2007, Pinal County prepared the *Pinal County Open Space and Trails Master Plan*. As an outcome of the master plan, the BLM land that comprises the Palo Verde Mountains and Vekol Wash area was identified as “Regional Park #4.” Across the county, a total of 168,700 acres for regional parks was identified as well as a network of existing and planned open spaces across the county to meet the need of the growing population, to protect these open space areas from development, and/or to influence the inclusion of open space in future development.

Acknowledging that growth and development across the county is inevitable, in 2013, Pinal County began discussions with the BLM regarding the cooperative management of a possible recreation area in the Palo Verde Mountains. In partnership with BLM, this Recreation Area Master Plan (RAMP) has been prepared for the Palo Verde Regional Park Cooperative Recreation Management Area (CRMA).

1.2 BLM Regional Planning and Process

In September 2012, after several years of hard work and collaborative efforts, the BLM completed the Resource Management Plan (RMP) for the LSDA. The RMP provides guidance for the management of the LSDA, which is located across portions of Gila, Maricopa, Pima, Pinal, and Yuma counties. It includes broad land use plan decisions that provide the overall direction for managing resources and resource uses in the LSDA. Land use plan decisions are expressed as goals and objectives (desired outcomes), allowable uses, and management actions anticipated to achieve desired outcomes. The approved RMP does not include any implementation-level decisions; future implementation of the Record of Decision, including components of this RAMP, will require additional steps and analysis under the National Environmental Policy Act (NEPA) before on-the-ground activities can begin.

After approval of the RAMP by Pinal County and the BLM, the Cooperative Management Agreement will (CMA) establish the framework for plan implementation. A CMA is an implementation tool for the RAMP and is executed to establish the framework for RAMP implementation. The purpose of the CMA is to ensure that the project partners work collaboratively to adopt, implement, and adhere to the Palo Verde Mountains RAMP developed for the area, which includes the details for on-site management of the area. Specific roles and responsibilities for both agencies will be delineated to avoid confusion and ensure proper management.

1.3 Overview of the Master Planning Process

The RAMP is a blueprint for the future. It is a comprehensive document, long-range in its views, that is intended to guide land management decisions in the Cooperative Recreation Management Area (CRMA) for the foreseeable future. The RAMP has been prepared to respond to stakeholder direction and public comment within the framework of BLM public land policy and Pinal County policy and guidelines. The RAMP sets public policies regarding recreation use, land management, and supporting facility development. The information and concepts presented in the RAMP are intended to guide land manager's decisions for recreation uses of the public land within the CRMA, as well as provisions for public facilities.

The public participation program for the master plan was established with the following objectives:

- Gather input from and inform the public
- Identify public recreation needs and issues
- Identify desired locations for recreation areas and facilities
- Identify locations for Recreation and Public Purposes (R&PP) patents
- Develop a framework for the CMA

Two types of meetings were conducted for the RAMP: Stakeholder Advisory Group (SAG), and public meetings/open houses. Each meeting type or committee served a distinct purpose throughout the different phases of the project. Press releases, newspaper articles, a project website, questionnaires/surveys, and public meetings were all different methods use to communicate to the public regarding the RAMP process. To date, three public meetings/open houses were held on December 10, 2015; March 31, 2016; and June 7, 2016. This document is a draft of the proposed

CRMA master plan. It will next be discussed in a Work Session with the Open Space and Trails Advisory Commission on October 11, 2016 for review and input. The direction given at the Work Session will include recommended next steps in the public input process.

1.4 Data Inventory and Analysis

The CRMA is located in the mid-elevations of the Sonoran Desert. The Sonoran Desert is a complex system of living organisms and inorganic materials and is one of the largest and hottest deserts in North America. The CRMA's multiple "sky islands" (mountain islands in a desert sea) setting is bisected by Hidden Valley and the ephemeral Vekol Wash. Public use of the land, since early settlement in the Maricopa region starting in the mid-1800s, has created varying degrees of impact on the desert's natural system. Recreation use and supporting facility development proposed by the RAMP will help to control these impacts and limit further degradation and overuse and significant abuse of some areas. Many of the unsound ecological and negative aesthetic impacts on the public land occurred, and continue to occur, because of a failure and/or an indifference to either consider or understand natural and cultural factors. A major objective in the planning process for public land managers is to see that both the ecological and cultural impacts of recreation use and supporting facility development are minimized, while optimizing human use and enjoyment of the land. Sound recreation management and appropriate and focused facility development will limit further impacts and aid in restoration of biologically significant areas.

The data elements listed below are the primary analysis data sets considered to establish an analytical planning approach that thoroughly investigates the CRMA as both a natural and cultural system. By recognizing and studying these data sets, planners and land managers can find and maintain a balance between man's activity, the environment, and the CRMA's character. These are discussed in greater detail in Chapter 4 – Data Inventory and Analysis:

- Landforms and Topography
- Landforms and Topography
- Soil Resources
- Vegetation
- Visual Resource Management
- Hydrology
- Biology
- Surrounding Land Uses/Ownership
- Existing Grazing Leases/BLM Land Use Activities
- Active Mining Claims and Historical Mine Locations
- BLM Recreation Opportunity Spectrum
- Open Space and Trails
- Existing Recreation Related Facilities
- Transportation and Access Issues
- Utilities
- Drive Time Analysis
- Composite Site Analysis

1.5 Recreation Needs Assessment



Although there is an abundance of open spaces and public lands across Pinal County that could attract seasonal and year-round visitors, there are a very limited number of developed municipal and county recreation facilities. Disproportionate to its population, Pinal County provides very few recreation facilities. Opportunities at the three existing parks are limited to picnicking, small playgrounds, a softball field, basketball courts, a few short trails, and unimproved camping. As reported in the *Pinal County Open Space and Trails Master Plan*, “large areas of pristine Sonoran Desert exist in and throughout Pinal County, and with rapid

urbanization the need to preserve large tracts of unfragmented desert becomes increasingly more important.”

The 2003 *Arizona Statewide Comprehensive Outdoor Recreation Plan* (SCORP) established that there is a need for more park space in Pinal County. The residents of the county were asked to rate their preference for types of parks to receive funding. Forty percent of the respondents preferred funding to be directed toward large nature-oriented parks, 27 percent toward open space, 18 percent toward neighborhood parks, and 15 percent toward multi-use parks. Public comments from stakeholders and public meetings throughout the [OS&T Master] Plan preparation process reinforced these findings with additional emphasis placed on special use areas, such as equestrian facilities and OHV areas (Logan Simpson Design, Inc. 2007).

With the recent adoption of the Open Space and Trails (OS&T) Master Plan, Pinal County has recognized the gaps in service to the recreating public. As such, it is in the beginning stages of providing recreational opportunities on a regional scale. In addition to the proposed CRMA, Pinal County is in the planning phases for other regional facilities located broadly across the county, which will provide nearby recreation opportunities to a larger portion of county residents and visitors. The proposed CRMA would not only provide area residents and visitors close access to a Pinal County park, but would allow the Open Space and Trails Department to:

- Address growing recreation demand in western Pinal County and provide the visiting public with on-site amenities
- With the BLM, provide oversight and protection of the natural resources of the Sonoran Desert within the CRMA
- With the BLM, mitigate and restore damaged areas caused by unauthorized and illegal recreation activities, which are a growing occurrence and observable problem

A Recreation Activity Evaluation (RAE) was prepared to obtain input from the stakeholders and public regarding the needs and/or desires for recreation facilities and uses in the CRMA. Public input was gathered during Public Meeting #1 along with input from the SAG. Additional information was obtained through the project website. Comments and issues gathered during this process were also reviewed, evaluated, and summarized in relation to alternatives. The results of the

RAE are the basis for the recreational activities and facilities proposed in the alternatives, which are presented in Chapter 6 - Cooperative Recreation Management Area Master Plan.

A characteristic of a regional, state, or federal park system is that, to the extent possible, it often functions as a non-profit business enterprise. In order to provide basic services to the public, perform maintenance, and staff its operations, it strives to operate on revenues that it collects in the form of park entry, camping, special use fees, and a percentage of concessionaire revenues. The rationale behind recreation fees and other types of use fees is that those who use particular services and facilities should pay for a larger portion of the costs, rather than require other taxpayers who never use the amenities to pay the entire cost. Specific use fee categories for standard amenities, expanded amenities, and special recreation permits will be a future policy decision by the Board of Supervisors and will be defined in the CMA between Pinal County and the BLM. Charged fees will be commensurate with the benefits and services provided to CRMA visitors and in keeping with a use fee schedule.

1.6 Recreation Area Master Plan

Four alternatives were developed using the data analysis, inventory, recreation needs assessment, and the SAG and initial public meetings. These were presented to the SAG and at Public Meeting #3 for review as part of the planning and public involvement process. The alternatives ranged from Alternative A - No Action to progressively increasing levels of passive and active recreation opportunities and supporting facility development for Alternatives B, C, and D. Additionally, Alternatives B, C, and D proposed options to separate non-motorized and motorized trail uses. All of the alternatives are compatible with the RMP and the OS&T Department's mission and vision. Public review included both public meeting presentations and online access to the public meeting materials at Pinal County's project webpage. Attendees to the meetings provided written input, and online visitors were asked to respond via an online questionnaire.

The resulting Draft Preferred Alternative is a mix of various opportunities and management actions analyzed during the alternatives review period. It sets the course for recreation opportunities and management in the CRMA into the foreseeable future.

Based on a multi-month review period involving public comments and Pinal County operational and management considerations, the progressing levels of change of the alternatives were analyzed and consolidated into a Draft Preferred Alternative that is a middle ground of the public's wide range of opinions and voting preference for Alternative A, B, C, or D. The Draft Preferred Alternative, see Figure 6-5, most closely represents features of Alternative C – Moderate Change. Most opportunities and actions provided by Alternative C have been carried forward into the Draft Preferred Alternative, including:

- Non-motorized trail uses (hiking, running, and biking, and equestrian)
- Motorized trail uses on authorized



trails

- Equestrian facility uses, except for arenas
- Interpretive uses, including an interpretive center, small amphitheater, wildlife viewing and bird watching, and photography
- Family picnic areas and playgrounds
- Camping uses
- Shooting sports, except a paintball field
- Miscellaneous use, including geocaching, rock climbing, and an off-leash dog area. Additionally, disc golf is included as an appropriate miscellaneous activity.

1.6.1 Management Controls

Prior to initiating changes in the CRMA's future direct use regulations, Pinal County and the BLM will ensure that a careful assessment is made of how visitor-use dynamics interrelate with the RAMP. Pinal County will be the on-site recreation manager, providing recreation management throughout the CRMA as guided by the CMA. The BLM will continue to manage traditional permitted land uses, such as mining and grazing leases, should they occur.

Due to an anticipated and ever-increasing recreation use in the CRMA, a major issue discussed during the review period was the issue of direct management controls, including how much would be charged for entry fees, where these would occur, and what would be the public benefit.

The RAMP provides for optimum levels of a variety of visitor uses by offering non-fee areas and fee-regulated areas. Fee-regulated areas will provide direct benefits and facilities for what would otherwise not be provided to the public without the presence of a Pinal County park, such as developed day-use facilities, camping areas, and a shooting facility. The fees charged will be commensurate with a facility entrance and use fee schedule that will be authorized by the Board of Supervisors. Pinal County will apply to lease/patent parcels from the federal government under the R&PP Act, according to BLM policies, for the proposed fee-regulated areas. All fees collected will provide direct benefit to the CRMA. Pinal County will also be responsible for all special use permitting in the CRMA that is of a recreational nature, including both commercial and non-commercial uses.

Non-fee-regulated uses and non-developed access will continue to be allowed to trails that are currently authorized by the BLM, as long as they are in keeping with the goals of the CRMA.

1.6.2 Goals and Actions

A significant long term goal of the RAMP is to allow and manage the public lands for the types of public recreation use that will not degrade the natural resources of the CRMA. Fourteen long term and four short term management goals for both public use and the maintenance of ecological integrity of the CRMA were developed for the RAMP.

1.7 Capital Improvement Plan

In the next few weeks, a Capital Improvement Plan (CIP) will be prepared as a general guide for potential priority of development. Through further study, it will be divided into phases for the major components of the Draft Preferred Alternative with improvements anticipated across a multi-year time frame. The estimate will be an order-of-magnitude approximation of the potential development costs associated with the proposed facilities.

Palo Verde Regional Park

Project Location

Project Features

Proposed Regional Park Boundary

Land Ownership

- State Trust Land
- Indian Reservation
- Bureau of Land Management
- Private/Other

Reference Features

- Interstate
- Highways
- Major Roads
- Roads
- Other Roads
- Railroad
- Stream/Wash
- County Boundary
- Indian Community Boundary
- Sonoran Desert National Monument
- Lower Gila Terraces and Historic Trails ACEC

Project Location



Sources

Bureau of Land Management, Arizona State Office, 2014
 USGS, 2015
 ESRI Street Map, 2013
 Pinal County, 2015

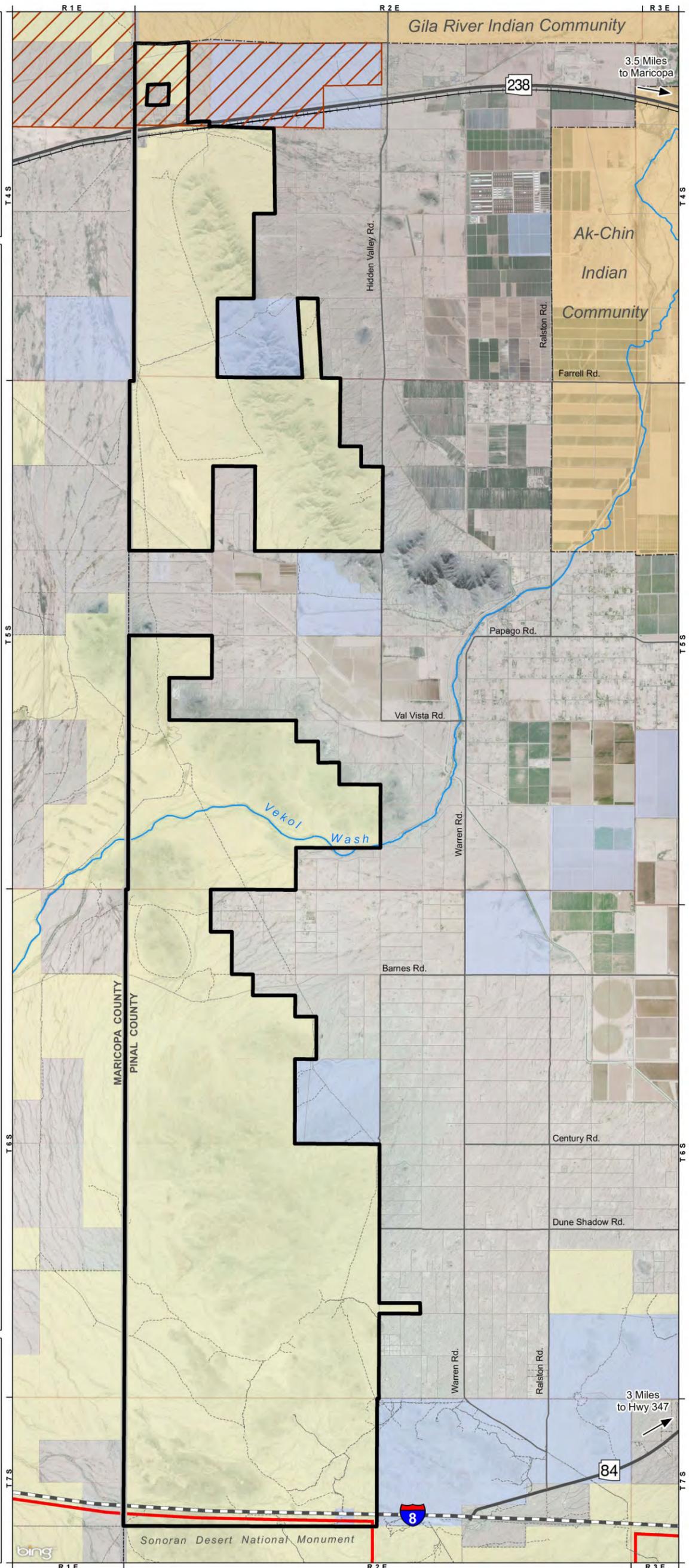
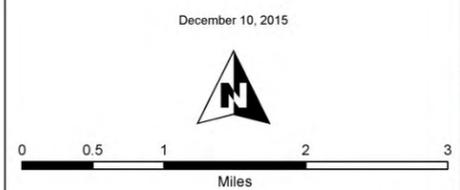


Figure 1-1 Project Location

SECTION 2 – BACKGROUND AND AREA HISTORY

2.1 Background

The proposed Palo Verde Regional Park is an area of approximately 21,900 acres of mountain ranges, alluvial plains, and riparian areas owned by the BLM (Figure 1-1). The proposed regional park is a small portion of the BLM's vast region known as the LSDA. The Palo Verde Mountains area in general is attractive to users for many of the same open space and natural resource recreation opportunities provided in neighboring regional park systems, such as Maricopa County Parks and Recreation Department and Pima County Natural Resources, Parks, and Recreation Department. Some of the most popular activities in the Palo Verde Mountains area include (in no particular order) OHV use, horseback riding, hiking, mountain biking, wildlife viewing, target shooting, and hunting. These activities are largely unstructured and there are no facilities or amenities provided by BLM. There is also very little BLM oversight or monitoring of the area. Unregulated, unauthorized, and illegal use is visible throughout the area, as evidenced by the enlargement of and growing number of shooting areas that are strewn with shell casings, shot-up saguaros, and projectile pock-marked rock outcroppings; trash dumping; uncontrolled wild cat trails; sign vandalism; cut fences; and more.

The **Recreation Area Master Plan** determines the recreational uses and needs of the area and identifies the management actions required to reach the desired outcomes of the public, Pinal County, BLM, and the neighboring municipalities.

The **Cooperative Recreation Management Area** is the defined area for which BLM will enter into a Cooperative Management Agreement with Pinal County to manage the recreation land and any developed recreation facilities in the CRMA as a result of the RAMP.

After approval of the RAMP by Pinal County and the BLM, the **Cooperative Management Agreement** will establish the framework for plan implementation. A CMA is an implementation tool for the RAMP and is executed to establish the framework for RAMP implementation. The purpose of the CMA is to ensure that the project partners work collaboratively to adopt, implement, and adhere to the Palo Verde Mountains RAMP developed for the area, which includes the details for on-site management of the area. Specific roles and responsibilities for both agencies will be delineated to avoid confusion and ensure proper management.

Urban growth in and towards the western Pinal County and Maricopa area has been occurring at a fast pace over the past several decades. Pinal County was the second fastest growth county in the nation between 2000 and 2010—increasing by an astounding 109 percent, from 180,000 to 376,000 people. The Arizona Department of Commerce estimates that the county will reach a population of 732,000 by 2025 and 1.3 million by 2050 (The Trust for Public Land 2012). Likewise, recreation use in the county has grown and will continue to burgeon as well.

Acknowledging that growth and development across the county is inevitable, in 2013, Pinal County began discussions with the BLM regarding the cooperative management of a possible recreation area in the Palo Verde

Mountains. In partnership with BLM, this RAMP has been prepared for the Palo Verde Regional Park CRMA.

2.1.1 Pinal County Open Space and Trails Planning

In 2007, Pinal County prepared the *Pinal County Open Space and Trails Master Plan*, which was the foundation of the Open Space and Recreation Element of the *We Create Our Future, Pinal County Comprehensive Plan, 2009*. The planning process included a total of six public meetings and numerous presentations to the Planning and Zoning Commission and the Board of Supervisors to identify the community's diverse interests, issues, and needs in an effort to provide a common vision and comprehensive foundation for the development of the master plan. The meetings occurred from June 27, 2006, through November 1, 2006. The final public meeting was held in the western Pinal County area, in Maricopa. The master plan was approved by the Board of Supervisors on October 31, 2007. As an outcome of the master plan, the BLM land that comprises the Palo Verde Mountains and Vekol Wash area was identified as "Regional Park #4." Across the county, a total of 168,700 acres for regional parks was identified as well as a network of existing and planned open space across the county. The vision for the master plan states:

"Pinal County's Open Space and Trails Master Plan promotes the quality of life of the region by providing areas of passive and active recreational opportunities, while conserving existing resources, such as natural scenic beauty, view corridors, wildlife habitat, agricultural resources designated at risk, and cultural heritage for the benefit of present and future generations. This Plan will encourage appropriate long-range growth planning opportunities, provide for a wide range of recreational activities for residents and visitors, preserve the county's rural and natural open space character, and contribute to the wellbeing of its communities."

In 2013, after several years of public input and planning for the protection of open space and development of a county wide open space and trails system, the Pinal County Open Space & Trails Department was created by the Board of Supervisors with the mission "to provide outdoor leisure, recreation, environmental, cultural, and natural resource management services to Pinal County residents and visitors so they can have access to, understanding, and enjoyment of the natural assets of Pinal County."

In 2013, after a lengthy 24-month public involvement process that included thousands of people throughout Pinal County, the *We Create our Future, Pinal County Comprehensive Plan* was updated as required by state law. The Open Space and Places chapter "encourages appropriate long range growth planning opportunities, provides for a wide range of recreational activities for residents, visitors, preserves the County's rural and natural open space character, and contributes to the well-being of its communities." The Open Space and Places chapter incorporates the key elements from the *Pinal County Open Space and Trails Master Plan*. The chapter states:

"The growing need for a public open space system to protect natural resources, critical habitats, and other environmentally sensitive lands is a key area of focus for the County. In 2003, Arizona State Parks conducted a telephone survey of residents in Pinal County. The survey results indicated that respondents preferred nature oriented parks and would prefer to see acquisition dollars go toward buying large open spaces with habitat for wildlife.

The benefits of open space preservation are well known. Open space protects our water supply, reduces flood hazards, promotes diversity of plants and wildlife, and provides places for the enjoyment of nature and scenic beauty. By preserving open space within the framework of parks, greenways, and other preserved land, an interconnected system of

natural and cultural resources can be established. There are several ways in which open space can benefit Pinal County:

Wildlife and native plant habitat. Open spaces provide habitat for native plants and animals that cannot live in urban and suburban environments. Large tracts are particularly important to native species. Large desert areas are also needed to support many native birds.

The plan identifies high-value habitat areas which are typically undisturbed (relatively pristine) areas with good wildlife movement corridors, and provide optimal cover, food, and water resources. Critical habitats, as defined by the Endangered Species Act, are areas that are occupied by a species listed as threatened or endangered within which are found geographical features essential to the conservation of the species, or an area not currently occupied by the species, which is itself essential to the conservation of the species.

Sensitive lands and natural resource preservation. Open space can be used to preserve unique and sensitive natural features, including but not limited to the mountains and hills, large rock formations, native landscape, archeological and historical sites and significant washes.

Water quality protection and flood prevention. Natural washes retain flood waters and reduce flood damage. They can also provide valuable wildlife habitat if protected in appropriate amounts and configurations. Groundwater supplies are replenished in places where water soaks into the soil and reenters aquifers.

Recreation. Hiking, biking, horseback riding, hunting, fishing, camping, and bird watching are recreational activities that require extensive open spaces and natural areas.

Sense of place. Many of the things that help define Pinal County's character are associated with open space, including agriculture, historic structures, and scenic vistas. Open spaces provide areas of visual relief by providing areas without new development.

Education. Functional open spaces provide areas to learn about the ecological connections among people, wildlife, and the land.”

In September 2015, Pinal County selected EPG as the planning consultant to assist in the preparation of the RAMP. After approval of the RAMP and completion of any required NEPA analysis, a CMA will be executed to establish the framework for plan implementation. Specific objectives of the RAMP are to include:

- Establish an appropriate managerial and physical framework for the collaborative management of recreation use in the CRMA, establishing the CRMA as a

The **National Environmental Policy Act** of 1969 (83 Stat. 852; 42 USC § 4321 et. seq.) requires federal agencies to analyze their actions in a decision-making process that is open to public review and where responsible officials take a hard look at and disclose the potential environmental effects of their actions. Compliance with NEPA is required of all federal actions including adoption of official policy, adoption of formal plans, adoption of programs, and approval of specific projects whether the action is developed by or submitted to the BLM.

recognized BLM “recreation area.”

- Retaining and/or preserving the open space characteristics of the area, remaining available for public enjoyment in current and future generations, while ensuring the CRMA is predominantly retained in federal ownership.
- Identify approximate locations that Pinal County will apply to lease/patent from the federal government under the R&PP Act. The proposed parcel(s) size will be for only the amount of land required for efficient operation of the proposed developed facilities, e.g., day use areas, trailheads, and/or camping areas.
- Produce sustainable beneficial outcomes from public recreation opportunities that are consistent with plan decisions and the desired future condition identified in land use plans.
- Provide for the protection of natural, cultural, historical, and wildlife resources and the sustainability of traditional uses in the CRMA.
- Provide for public safety and mitigate or eliminate hazards as identified; strive to reduce visitor use conflicts and avoid conflicts between the recreational and historical uses, i.e., grazing or mining.
- Promote collaborative management and community-based planning.
- Combine and use the knowledge, skills, and resources available from the parties to the greatest extent possible.
- Include an outline of a recreation fee program addressing the criteria required in the Federal Lands Recreation Enhancement Act to establish standard and expanded amenity fees on public lands.

Recognizing the strong public need for a nationwide system of parks and other recreational and public purposes areas, in 1954 the Congress enacted the **Recreation and Public Purposes Act** (68 Stat. 173; 43 USC § 869 et. seq.) as a complete revision of the Recreation Act of 1926 (44 Stat. 741). This law is administered by the BLM (BLM 1996). The act authorizes the lease and patent of public lands for recreational or public purposes to state and local governments and to qualified nonprofit organizations. Costs typically are negligible and often are assessed only to cover federal administrative costs of the patent. In accordance with BLM policies, Pinal County will apply to lease/patent parcels for facility development for day use areas, campgrounds, and similar. Preliminary example concepts are provided in Chapter 6. The vast majority of the CRMA will remain in federal ownership.

2.1.2 BLM Regional Planning

In September 2012, after several years of hard work and collaborative efforts, the BLM completed the RMP for the LSDA. The RMP provides guidance for the management of the LSDA, which is located across portions of Gila, Maricopa, Pima, Pinal, and Yuma counties. It includes broad land use plan decisions that provide the overall direction for managing resources and resource uses in the LSDA. Land use plan decisions are expressed as goals and objectives (desired outcomes), allowable uses, and management actions anticipated to achieve desired outcomes. The approved RMP does not include any implementation-level decisions; future implementation of the Record of Decision, including components of this RAMP, will require additional steps and analysis under NEPA before on-the-ground activities can begin.

The CRMA is primarily within the Buckeye Hills, Rainbow Valley, and Vekol Valley geographic reference area of the RMP. The small portion of the study area that occurs south of I-8 is within the Sonoran Desert National Monument geographic reference area, see Figure 4-8.

Additionally, the CRMA is not within a Recreation Management Area (RMA) defined by the RMP. RMAs “are land units where Recreation and Visitor Services (R&VS) objectives are recognized as a primary resource management consideration and specific management is required to protect the recreation opportunities” (BLM 2011). However, “public lands that are not designated as RMAs are managed to meet basic R&VS and resource stewardship needs.” Recreation is not emphasized; however, recreation activities may occur except on those lands closed to public use. The R&VS are managed to allow recreation uses that are not in conflict with the primary uses of these lands.

Through a land use planning process, the BLM develops **Resource Management Plans** for public lands. In accordance with the provisions of the Federal Land Policy and Management Act of 1976 (43 USC § 1711-1712), these plans ensure that public lands are managed under the principals of multiple use and sustained yield. Land use plans and planning decisions are the basis for every on-the-ground action the BLM takes.

An RMP is a blueprint explaining how the BLM will manage areas of public land over a period of time (generally 10-15 years). BLM Field Offices or District Offices prepare RMPs for the lands within their boundaries. RMPs contain decisions that guide future management actions and subsequent site-specific implementation decisions. RMPs establish goals and objectives for resource management (desired outcomes) and the measures needed to achieve these goals and objectives (management actions and allowable uses). The development of an RMP emphasizes a collaborative approach in which local, state, and Tribal governments; the public; user groups; and industry work with the BLM to identify an appropriate mix of uses and protections for the public lands.

Requirements: Management actions and allowable use decisions will still be necessary to address basic R&VS and resource stewardship needs:

- Visitor health and safety.
- Use and user conflicts.
- The type(s), activities, and locations where special recreation permits would be issued or not issued.
- Mitigations of recreation impacts on cultural and natural resources” (BLM 2011).

2.2 Location and Setting

The study area for the CRMA encompasses approximately 21,900 acres, which is more than 34 square miles, see Figure 4-9. Located in western Pinal County and southwest of Maricopa, the CRMA is one of seven planned regional parks per the Open Space & Trails Master Plan, Pinal County (OS&TMP). The western boundary of the CRMA is the Pinal and Maricopa county line. The CRMA features multiple ecosystems of the Sonoran Desert, including Arizona Uplands represented by the Palo Verde, Halley Hills, and Table Top Mountains; foothills represented by Hidden Valley; and riparian areas along the Vekol Wash and other tributary washes.

Until the past few decades, the study area has remained largely unchanged despite the fact that it has been modified by trails, roads, state highway, interstate highway, railroad, and utility corridors. With the increasing population, low-density residential development has been increasing rapidly in the plains on the eastern side of the study area. Agriculture has been an important industry to the Hidden Valley area for many years. However, on the west side of the CRMA, which is Maricopa County, little has changed. The area is sparse and open desert land.

Because of its mountain features and nearby access, the area is much loved by recreationists, e.g., equestrian and OHV users predominantly, hikers, and target shooters. Additionally, the area has become a known trafficking corridor for drugs and illegal immigrants. The challenge of future implementation of the RAMP will be to satisfy the many recreation needs, sometimes competing with one another, maintain environmental and cultural integrity, improve the quality of recreation experiences for a growing population, and consider visitor safety.

2.3 Area History

Human occupation of the region spans at least the last 12,000 years. A thorough discussion of the area's prehistoric period can be found in *A Class I Cultural Resources Inventory for the Palo Verde Regional Park Master Plan, Pinal County, Arizona*, which was prepared as a task of the RAMP.

2.3.1 Historic Period (post-1840)

2.3.1.1 Maricopa Wells

Much of the earliest settlement in the Maricopa region can be attributed to Maricopa Wells, an oasis around a series of watering holes on the Santa Cruz River. Maricopa Wells developed into a trading center and waypoint along the Southern Emigrant Trail. Beginning in 1846, the trail was a major land route for immigration from the eastern United States to California, then part of Spain. California and most of the Southwest became a part of the United States by the Treaty of Guadalupe Hidalgo in 1848. Maricopa Wells also became a stop for the San Antonio-San Diego Mail Line from 1857-1858 and the Butterfield Overland Mail Route from 1857 to 1861. The Butterfield Overland Mail was a stagecoach and U.S. Mail service, connecting Memphis, Tennessee and St. Louis, Missouri to San Francisco, California. The stop was one of 139 relay stations along the 2,795 mile route from St. Louis to San Francisco. E.O. Stratton, a clerk and bookkeeper at Maricopa Wells, wrote in his diary,

“Though small, Maricopa Wells was a busy place. The stages passing twice a day, one eastbound and one westbound, changed animals and fed their passengers here. When troops



were discharged – and this was often – the stages were full both ways. At other times there was a predominance of passengers from the West. Not only were many Californians coming into the country, but there also were the Easterners who had gone by train or around the Horn to San Francisco, then came down the coast to San Diego and into Arizona by stage. Then, too, Maricopa Wells was the division point for Phoenix, Fort McDowell on the Verde and other places to the north.

The camping ground outside the enclosure was also a busy place. Great freight trains of three or four wagons and eight to 20 mules were often camped there; and detachments of soldiers – from a few scouts to one or more companies – might turn in for the night. Soldiers scouting through the immediate country usually made Maricopa Wells their supply station; and all westbound traffic, whether or not they camped, had to load up with enough water to last across the desert from Maricopa to Gila Bend, a distance of 45 miles which meant at least one night's camp." ("E.O. Stratton's 'Gold Fever,'" n.d.)

Maricopa Wells was located approximately six miles north of present day Maricopa and four miles west of Pima Butte. With the construction of the Southern Pacific Railroad in 1879, a new community was formed at the intersection of the railroad's future spur line to Phoenix. (It wasn't until the mid-1870s that Phoenix began to be a town of significance. Its population was 500 in 1871, but by 1878 had grown to 1,500. Phoenix wasn't incorporated until 1881 and did not become the territory capital until 1889.) No longer needed as a stage stop, Maricopa Wells' importance waned, and within a few years, was abandoned. Its former site is located on the Gila River Indian Community Reservation and is no longer even identifiable: with structures built from adobe, it has dissolved back into the ground.

2.3.1.2 Pinal County

In 1875, Pinal County was created by the Eighth Legislative Assembly of the Territory of Arizona as the territory's sixth county from portions of Pima, Maricopa, and Yavapai counties. Florence was selected as the county seat. Maricopa County was created just four years prior, and the four original counties (Mohave, Pima, Yavapai, and Yuma) were created in 1864. Pinal County's current boundary was settled in 1881, when portions of Maricopa and Pinal counties were carved off to create Gila County.

2.3.1.3 Maricopa

The new community that began at the railway intersection was quickly named Maricopa, dropping the "Wells" portion of its predecessor's name. In 1887, the spur line was completed from Maricopa to Phoenix, passing through Tempe. A more weather-reliable route was constructed in 1926 from Picacho to Chandler and Phoenix. However, the Maricopa-Phoenix spur remained in operation until 1935. Soon after its closing though, the tracks to Phoenix were removed. Maricopa had been a significant hub of commerce in Arizona for several decades. After the spur closed,

"Maricopa lost its importance as a junction but found its desert lands were ideal for farming. Maricopa's raw desert was cultivated into rows of green plants, offering up snowy white blossoms of cotton between 1948 and the 1960s. Throughout the years, cattle became an important industry and farmers experimented with, and grew, a variety of other crops including alfalfa, peas, melons, citrus, and pecans.

When Maricopa incorporated in 2003 as the 88th city in Arizona, the 2000 census listed it with a population of 1,040. During the following two years, its population exploded to 15,934 earning it the title of one of the fastest growing cities in the United States.” (“History of Maricopa,” n.d.).

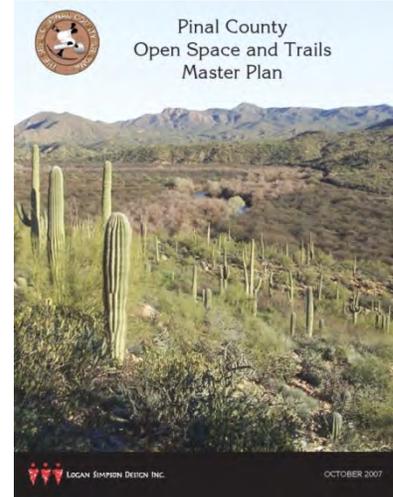
Maricopa’s population has continued to see significant growth. In 2010, the U.S. Census calculated its population as 43,482.

The main railway continues in operation today through Maricopa and the CRMA. However, the Southern Pacific Railroad became a part of the Union Pacific Railroad system in 1996. Also in 1996, Amtrak opened services to Maricopa upon the closing of the Phoenix Station.

SECTION 3 – OVERVIEW OF THE MASTER PLANNING PROCESS

The RAMP is a blueprint for the future. It is a comprehensive document, long-range in its views, that is intended to guide land management decisions in the CRMA for the foreseeable future. The RAMP has been prepared to respond to stakeholder direction and public comment within the framework of BLM public land policy and Pinal County policy and guidelines. The RAMP sets public policies regarding recreation use, land management, and supporting facility development. The information and concepts presented in the RAMP are intended to guide land manager's decisions for recreation uses of the public land within the CRMA, as well as provisions for public facilities.

The planning process for the Palo Verde Regional Park (and other planned parks and open space areas) began when leaders from Pinal County approached the BLM in the mid-2000s about the creation of a county-wide open space and trails system that would utilize federal land as a way to protect the rural open space and to provide facilities that would direct use to maintain the natural integrity of the public lands and other open spaces. The OS&TMP and the General Plan framed the purpose and need for the Palo Verde Regional Park. As discussed in Chapter 2, initial planning for this RAMP began in 2013 in discussions with the BLM.



3.1 Plan Objectives

The public participation program for the master plan was established with the following objectives:

- Gather input from and inform the public. A high degree of public interest in the RAMP was anticipated. The public was informed of current activities in the planning process through public meetings, news releases, social media, and the Pinal County website. Additionally, local print media was in attendance at several events and published articles. The major steps in the planning process included opportunity for public reviews and comments, including data analysis, opportunity and constraint identification, review of master plan alternatives, and ultimately the review of the preferred master plan through this document.
- Identify public recreation needs and issues. In addition to the surrounding communities, Pinal County residents and other visitors will use the CRMA. Identifying recreation needs was a key component of the planning process. Recreation needs and concerns expressed by the public were incorporated into the planning process. The gathering of this information was achieved through formation of a SAG and its meetings, agency contacts, and public meetings.
 - Identify desired locations for recreation areas and facilities.
 - Identify locations for R&PP leases/patents.
 - Develop a framework for the CMA.

3.2 Public Outreach Efforts

Press releases, newspaper articles, a project website, questionnaires/surveys, and public meetings were all methods used to communicate to the public regarding the RAMP process. A copy of all

documents used to notify the public of upcoming events related to the master plan process as well as public input received will be compiled in an appendix.

3.2.1 Project Website

Pinal County created a project website to describe the planning process, provide project updates, gather public comments and feedback, and announce future public meeting dates and locations. Copies of the data analysis maps, alternatives, and related material were also placed on the website for review.

<http://www.pinalcountyz.gov/OPENSAPCE/RAILS/PARK/RAILPLANNING/Pages/PaloVerdePark.aspx>

3.2.2 Email Database

At each meeting, email addresses were collected of attendees and added to the project database. These email addresses were then used as an additional method to announce upcoming public meetings.

3.2.3 Media Coverage

The local media was used to keep the public-at-large informed of important project milestones, such as public meetings for the project. Press releases were distributed by Pinal County and were printed prior to each open house.

3.3 Public Meetings

Two types of meetings were conducted for the RAMP: SAG and public meetings. Each committee meeting and public meeting served a distinct purpose throughout the different phases of the project. Additionally, web-based surveys were used as a continuation of Public Meetings #1 and #3. At each public meeting, a comment form or questionnaire was distributed to all attendees. The purpose of the surveys was to gauge the public's opinion on the various issues facing the project at each milestone. Meeting participants were asked to complete the survey and return it in a timely manner for documentation purposes. Two web-based surveys were also created for the purpose of determining the recreation needs of the area and to determine the preferred alternative. Use of this service also allowed the public to provide open and honest feedback as participants could remain anonymous with their comments.

3.3.1 Stakeholder Advisory Group

A major component of the public participation program was the formation of a SAG by Pinal County to assist with public participation efforts. The purpose of the SAG was to establish a group representing a range of opinions in a forum small enough to allow for education of the participants of each other's special interest, detailed discussion of issues, and informal dialogue. Members were selected based on their knowledge of the project area, ability to represent a special interest, capability to commit time required throughout the project, and willingness to be impartial.

The SAG was composed of several organizations that included community leaders and representatives from potentially interested agencies and special interest groups. The SAG met three

times during the planning process: November 11, 2015; February 4, 2016; and May 26, 2016. The group's comments and concerns were integrated into the planning process, assisted in the resource and recreation activity analyses, and assisted in the development of the concept alternatives. Information and recreation recommendations identified by the group were used in conjunction with the recreation activity evaluation to develop the alternatives.

3.3.2 Public Meetings/Web-based Surveys

To date, three public meetings/open houses and two web-based surveys have been held. The meetings allowed the public to review and comment on project information, issues, and alternatives. The meetings were publicized through the county's project webpage, newspaper advertisements, press releases, and by a project email database. During and after each meeting, input was collected and incorporated when appropriate. The purpose and outcome of each is as follows:

3.3.2.1 Public Meeting #1: Scoping - December 10, 2015

The first meeting was held at the Pinal County Fleet Service Maintenance Yard at the intersection of John Wayne Parkway and State Route (SR) 84. There were 38 citizens in attendance. Because of potential public concern regarding future park activities, the first public meeting was an initial scoping meeting. An introduction to the planning project was given with a presentation of the approved regional open space planning to date, the purpose and need for the CRMA, its location, resource maps, the planning process that would be followed, and a project schedule.

An interactive "How Would You Recreate at Palo Verde Regional Park?" activity at the meeting included the public "voting" on how they would use the CRMA by placing dots on display boards of possible activities and facilities, see Exhibits X and X. Twenty-four attendees participated in this activity.

The public was also given a comment form to respond to a series of nine open-ended questions, plus one "other information" opportunity. Fourteen comment forms were returned. Additionally, the public was given the opportunity to take comment forms home, share with others, and be returned to Pinal County by mail or email later. No additional comment forms were returned. The compiled comments from the 14 returned forms will be provided in an appendix.

Of the 38 citizens in attendance, there were two (5.3%) comment forms returned reflecting that a park was not preferred.

3.3.2.2 Web-based Survey #1: Recreation Activities – December 17, 2015 through January 18, 2016

As a continuation of Public Meeting #1's "How Would You Recreate at Palo Verde Regional Park?" public meeting activity, Pinal County created a web based survey for the public to provide input on the possible recreation activities and to provide other comments. The survey was available for one month. There were 411 distinct respondents, as the survey was configured to allow only one response per internet protocol address. These were added to the 24 public meeting participants for a total of 435 recreation activities respondents.

Twelve of the 411 (2.9%) web-based respondents provided responses in the "additional comments" section reflecting that a park was not preferred.

3.3.2.3 Public Meeting #2: Recreation Survey Results and Example Site Concepts – March 31, 2016

The second meeting was held at the City of Maricopa’s Copper Sky Community Center. There were 66 citizens in attendance. For the benefit of anyone attending that wasn’t familiar with progress to date, a presentation was given that was similar to the first meeting’s presentation regarding the project background. In addition, the results of the “How Would You Recreate at Palo Verde Regional Park?” survey were presented as the Recreation Activity Evaluation. The 435 respondents to the two surveys showed a high demand for non-motorized trails; motorized trails; and equestrian, camping, family picnicking, and shooting range activities. The respondents showed moderate to low interest for interpretive activities, large group picnicking, playgrounds, some shooting sports activities, and various miscellaneous recreation activities, see Exhibit X. With the clear direction from the public that recreation activities and facilities were important to the public for the CRMA and to continue seeking public input, EPG presented example site concepts for two Day-use Areas, a Campground, and Shooting Sports Area.

There were two stations set-up at the meeting. The first station displayed the results of the Recreation Activity Evaluation. The second station displayed the example site concepts. The citizens were given a comment form for evaluation of the information at the two stations. There were 35 comment forms returned. The compiled comments from the 35 returned forms will be provided in an appendix.

Of the 66 citizens in attendance, there were eleven (16.7%) comment forms returned reflecting that a park was not preferred.

3.3.2.4 Public Meeting #3: Alternatives - June 7, 2016

The third meeting was held at the Central Arizona College, Maricopa Campus. There were 169 citizens in attendance. The meeting was a come-and-go open house where four alternatives (No Action, Minimal Change, Moderate Change, and Most Change) for the CRMA were presented. The citizens were given a comment form for evaluation of the alternatives and to select a preferred alternative. There were 127 comment forms returned.



3.3.2.5 Web-based Survey #2: Alternatives – June 10, 2016 through July 15, 2016

As a continuation of Public Meeting #1’s comments on the four alternatives, Pinal County created a web based survey for the public to provide input on the possible recreation activities and to provide other comments. The survey was available for five weeks. There were 718 additional respondents. These were added to the 127 public meeting participants for a total of 845 respondents. The preference for the alternatives was as follows:

| | | | Preference for a CRMA |
|---------------------------------|----------|-------------|-----------------------|
| Alternative A – No Action | 252 | 29.8% | |
| Alternative B – Minimal Change | 140 | 16.6% | |
| Alternative C – Moderate Change | 177 | 20.9% | 70.1% |
| Alternative D – Most Change | 275 | 32.5% | |
| <u>No Selection</u> | <u>1</u> | <u>0.1%</u> | |
| Total | 845 | | |

Alternative D was voted as the single most favorite of the four alternatives. The total combined votes (70.1%) for Alternatives B, C, and D indicated the public’s preference for some form of a CRMA versus the No Action alternative.

It should be noted that the survey was not configured to allow only one response per internet protocol address. Although not intended or advertised, persons were able to take part in the survey multiple times. The totals above include all responses including suspect submittals and obvious duplicates. Even including the suspect voting and obvious duplicate submittals, Alternative A was not the public’s single most favorite alternative.

3.3.3 Resolution

Input from each meeting, surveys, comments, emails, and letters were compiled for review and analysis by EPG and the SAG. A matrix was followed to track the main emphasis of the comments or whether the comments were related to the scope of the RAMP. Based on the determination of the Pinal County staff, SAG, and EPG, information was then incorporated into the final master plan.

As future site specific planning is conducted for implementation of the various elements of the CRMA, additional public input will be sought during each of the future design phases and/or projects.

3.3.4 Future Public Input

This document is a draft of the proposed CRMA master plan. It will next be discussed in a Work Session with the Open Space and Trails Advisory Commission on October 11, 2016 for review and input. The direction given at the Work Session will include recommended next steps in the public input process.

SECTION 4 – DATA INVENTORY AND ANALYSIS

The CRMA is located in the mid-elevations of the Sonoran Desert. The Sonoran Desert is a complex system of living organisms and inorganic materials and is one of the largest and hottest deserts in North America. The CRMA's multiple "sky islands" (mountain islands in a desert sea) setting is bisected by Hidden Valley and the ephemeral Vekol Wash. Public use of the land, since early settlement in the Maricopa region starting in the mid-1800s, has created varying degrees of impact on the desert's natural system. Recreation use and supporting facility development proposed by the RAMP will help to control these impacts and limit further degradation and overuse and significant abuse of some areas. Many of the unsound ecological and negative aesthetical impacts on the public land occurred, and continue to occur, because of a failure and/or an indifference to either consider or understand natural and cultural factors. A major objective in the planning process for public land managers is to see that both the ecological and cultural impacts of recreation use and supporting facility development are minimized, while optimizing human use and enjoyment of the land. Sound recreation management and appropriate and focused facility development will limit further impacts and aid in restoration of biologically significant areas.

The data elements presented below are the primary analysis data sets considered to establish an analytical planning approach that thoroughly investigates the CRMA as both a natural and cultural system. By recognizing and studying these data sets, planners and land managers can find and maintain a balance between man's activity, the environment, and the CRMA's character.

4.1 Landforms and Topography

The CRMA, along with most of Arizona, is located in the Basin and Range Province of the western North American continent. Basin and Range topography is characterized by abrupt changes in elevation, alternating between faulted mountain chains and flat arid valleys and basins. This topography has been uniquely described "as being composed of many short, abrupt ranges or ridges, looking upon the map like an army of caterpillars crawling northward. At length, about 150 miles north of the Mexican boundary, this army divides into two columns, one marching northwest, and the other north-northeast. The former branch becomes the system of mountain ridges spread over the southern and western portions of Arizona, the whole of Nevada and the western portion of Utah and extending into Oregon and Idaho" (Clarence E. Dutton, 1886). The CRMA's mountain ranges, Hidden Valley plain, and the region's neighboring mountain and valley landforms are representative of this description, although on a microscale of the entire Basin and Range Province (Figure 4-1).

The CRMA includes four relatively small but distinct mountain ranges that cross its boundary. North of Vekol Wash lay the Palo Verde Mountains, approximately seven miles long, and Haley Hills, approximately 5 miles long. The highest peaks in the Palo Verde Mountains and Haley Hills are approximately 2,100 and 1,920 feet in elevation, respectively. Both are unnamed.

Immediately south of Vekol Wash is one small unnamed mountain range approximately two miles long and at its highest only about 500 feet above the surrounding plains. The southern six miles of the CRMA is the northern extension of the Table Top Mountains, which mostly lie south of I-10, and includes the Table Top Wilderness. The highest peak within the CRMA is in this range at approximately 2,560 feet in elevation. This peak is also unnamed.

Surrounding the CRMA's four "sky islands" are alluvial plains that are fairly flat, gently sloping landforms, which are found at the base of most mountain ranges. Overall, the alluvial plains that comprise the perimeter of the CRMA slope from south to north. The lowest point in the CRMA is the alluvial plain off the northeast slope of the Palo Verde Mountains at approximately 1,250 feet in elevation. The high point of the alluvial plain is along I-10 at approximately 1,960 feet in elevation at its pass through the Table Top Mountains.

Vekol Wash bisects the CRMA and flows from west to east within the CRMA, but generally from south to north along its entire course. It enters the CRMA at approximately 1,480 feet in elevation and exits at approximately 1,400 feet in elevation along a course of just 3-1/3 miles. This equates to 4.5 feet per 1,000 feet, a fairly steep gradient for a desert waterway, which causes increased stormwater velocity and localized erosion along the wash course.

4.1.1 Slope Analysis

A slope analysis is an important tool in analyzing the land topography for suitable site selection for various potential uses. The four categories of slope used in this study's analysis were: (1) flat slopes, 0%-5%; (2) moderate slopes, 5%-10%; (3) steep slopes, 10%-20%; and (4) severe slopes, over 20%. Flat slopes are more suited to most types of land development related to a regional park, such as campgrounds, trailheads, roads, and parking areas. Development on flatter slopes requires less grading to accommodate a constructed use, will minimize disturbance to the natural environment, and is less costly to develop. Moderate slopes are developable, but require additional considerations for grading cut and fill and embankment rehabilitation, such as retaining walls and slope stabilization. Steep slopes should be avoided wherever possible or include significant mitigation or rehabilitation to lessen the impact on the land. Severe slopes are generally unusable for recreational land development purposes; the cost to develop and mitigate not being practical.

A slope analysis for the CRMA was prepared using these four categories (Figure 4-2). The only topographic data available for the master plan process is from the USGS. This data provides 20' contour intervals. Therefore, the level of accuracy is very general and should only be used as an approximation of slopes for an area. Slope analysis is an important component of site selection for development. Wherever steeper terrains are unavoidable for development, following the contour of the land will minimize the mitigation required to the affected areas and present the most aesthetic solution. Trails are the best example. Being relatively narrow, single-track trails follow the contour of the land when change of elevation is required or desired, and can be constructed on steep and severe slopes using appropriate techniques. The area of disturbance is relatively narrow and mitigation is minimal in comparison to a vehicular roadway on the same slope. Similarly, as an example, development of larger areas for parking on slopes greater than 2% should include curved parking bays that follow the contour of the land to minimize grading cut and fill, minimize embankments, and not compound accessibility issues.

Flatter slopes (0%-5%) that favor development coincide with the alluvial plains that surround the "sky islands" and along wash corridors. However, wash corridors should be avoided for facility development as much as possible to avoid culverts, rerouting of water courses, and possible localized flooding.

4.1.2 RMP Management Decisions

The RMP's one primary cave resources management action applies to the CRMA, with specific management sub-actions:

- CR-1: Protect and conserve caves and karst resources as they are discovered on the public lands.

The management sub-actions are described in detail in the RMP Section 2.2.2 Cave Resources.

4.2 Cultural, Historic, and Prehistoric Resources

A records search by EPG revealed a total of nine previously recorded sites within the study area (seven prehistoric and two historic), including three petroglyph sites identified during the 2010 Pinal County workshop. Five prehistoric sites remain unevaluated pending further investigation, while two have been recommended eligible for listing on the National Register of Historic Places (NRHP) under Criterion (d). Although not previously evaluated for their NRHP eligibility, the three petroglyph sites identified by the 2010 Pinal County workshop have been designated as Priority Prehistoric Cultural Resource Areas. One historic site remains unevaluated pending further investigation, while another, State Route 84, has been determined eligible for listing on the NRHP under Criterion (a) for its association with the Historic State Highway System. However, the segment within the study area has not been evaluated for its historic integrity, and it remains unclear if the segment is a contributing element to the overall significance of the study area. Additionally, 15 historic resources were identified on General Land Office (GLO) survey plats within the review area. These resources have not been identified, recorded, or evaluated during previous survey work.

The geospatial data derived from the records review revealed that approximately 661 acres (three percent) of the approximately 21,698-acre study area has been surveyed for cultural resources. These numbers, at a minimum, suggest one cultural resource site per 73 acres, and suggest the potential for an additional 288 sites within the unsurveyed acreage (approximately 21,000 acres). Based on this analysis, it is recommended that cultural surveys be performed for areas not previously investigated to accurately identify and evaluate unrecorded resources (Rayle 2015).

Additional information is available in A Class I Cultural Resources Inventory for the Palo Verde Regional Park Master Plan, Pinal County, Arizona, prepared by EPG.

4.2.1 Gila River Terraces and Lower Gila Historic Trails Area of Critical Environmental Concern (ACEC)

The northern tip of the north section of the CRMA is identified in the BLM RMP as the Gila River Terraces and Lower Gila Historic Trails Area of Critical Environmental Concern (ACEC), allowing for site-specific allocations to the category of public use at sites that are accessible and appropriate for interpretive development (BLM 2012). An ACEC designation highlights areas where special management attention is needed to protect, and prevent irreparable damage to, important historical, cultural, and scenic values; fish or wildlife resources or other natural systems or processes; or to protect human life and safety from natural hazards (BLM 1988).

4.2.1.1 Juan Bautista de Anza National Historic Trail

From 1775 to 1776, Spanish Lt. Colonel Juan Bautista de Anza led more than 240 men, women, and children some 1,800 miles from Culiacán in Mexico to establish a settlement at San Francisco Bay. Those families were some of the first colonists to enter present-day Arizona and the first to travel overland across the frontier of New Spain into present-day California. On October 30, 1775, Pedro Font recorded in his diary a stop at present-day Casa Grande Ruins National Monument:

“We had an opportunity to go and examine the house that is called La Casa Grande de Moctezuma... We were accompanied there by several Indians...who told us on the way a tale and tradition regarding the house, handed down from their forefathers” (“Anza Trail: Historic & Cultural Sites in Arizona,” n.d.).

In November 1775, the Anza Expedition is presumed to have passed through the present-day CRMA area, just skirting the Sierra Estrella Mountains to the south.

4.2.1.2 Butterfield Overland Mail Trail

The Butterfield Overland Mail Trail, also known as the Oxbow Route, the Butterfield Overland Stage, or the Butterfield Stage, was a stagecoach route that operated from 1857 to 1861. It was a United States mail delivery service that originated in two cities—Memphis, Tennessee and St. Louis, Missouri. The mail routes converged at Fort Smith, Arkansas and continued through Indian Territory, New Mexico, and southern Arizona to its final destination in San Francisco, California. The service provided communication between the eastern and western United States and territories before coast-to-coast railroad service began. The cost of mailing a letter was 10 cents.

The outbreak of the Civil War caused the quick withdrawal of almost all military troops from the frontier territory, leaving the area unprotected. In February 1861, when Texans voted to secede from the Union, the southern mail route was discontinued in favor of a northern route to California that avoided Texas. In fact, during the Civil War, the Arizona region of the New Mexico Territory was cut off from much communication with the outside world. The next public mail to reach Tucson came from California on horseback on September 1, 1865. Regular mail delivery wasn’t restored until the 1870s and 1880s. Although the Butterfield Overland Stage mail and passenger delivery lasted only 2 ½ years, it opened up the West to further settlement and introduced the country to its newest territories (“Butterfield Stage,” n.d.).

East and west of the present-day CRMA, stations were located at Maricopa Wells, approximately seven miles northwest of Maricopa, and Butterfield Pass, approximately twelve miles west of Mobile. The trail passed through the present-day CRMA, and like the Anza Expedition just skirted the Sierra Estrella Mountains to the south. However, unlike the Anza Expedition, the trail can be discerned and followed across much of this area.

4.2.2 RMP Management Decisions

The RMP’s three primary cultural and heritage resources management actions apply to the CRMA, each with specific management sub-actions:

- CH-1: Identify, preserve, and protect important cultural resources. Ensure they are available for appropriate uses by present and future generations.

- CH-2: Reduce threats, reduce or prevent damage, and resolve potential conflicts from naturally occurring or unauthorized human-caused damage or deteriorations.
- CH-3: Manage assemblages of sites within the Decision Areas as cultural landscapes.

The management sub-actions are described in detail in the RMP Section 2.2.3 Cultural and Heritage Resources.

The RMP's one primary paleontological resources management action applies to the CRMA, with specific management sub-actions:

- PL-1: Protect and manage any paleontological resources, including all vertebrate fossils, traces, and invertebrate or plant fossils of paleontological interest, found on public lands for scientific, educational, or recreational values.

The management sub-actions are described in detail in the RMP Section 2.2.4 Paleontological Resources.

As discussed above, the CRMA is overlaid by the Gila River Terraces and Lower Gila Historic Trails ACEC. The RMP's one primary ACEC management action applies to the CRMA, with specific management sub-actions:

- AC-1: Provide increased protection for resources of substantial significance and value, which include specific cultural resources, outstanding and scenic features, and priority and special status species, while continuing to provide the public access to enjoy these resources.
- Specific management actions AC-1.1.23 through AC-1.1.28 pertain directly to the Lower Gila Terraces and Historic Trails ACEC.

The management sub-actions are described in detail in the RMP Section 2.2.18 Areas of Critical Environmental Concern (ACEC).

4.3 Soil Resources

Note: Citation for nearly all text for this section is from the *Soil Survey of Pinal County, Western Part* (Hall 1991) and the NRCS Web Soil Survey ("Web Soil Survey," n.d.).

Pinal County, Western Part, consists of cropland, rangeland, and potentially arable land of the Casa Grande Valley and parts of the Santa Cruz and Gila River Valleys that lie within Pinal County. These valleys are within the Basin and Range province. Irrigated farming, some cattle ranching, feedlot operations, and copper mining are the most important industries. Irrigated farming is the largest industry. The main crops are cotton, small grain, and alfalfa.

4.3.1 Climate

Summers are hot and winters are cool in the survey area. Winter days are fairly warm, although the temperature drops below freezing most nights each winter. Rainfall is scant in most months but is heaviest in summer, when scattered thunderstorms develop in the moist air, which occasionally sweeps inland from the Gulf of Mexico. Snow cover in winter is not persistent and generally is confined to the higher elevations. The average annual precipitation is 6 to 8 inches, the average annual air temperature is 68 to 72 degrees F, and the average frost-free period is 240 to 325 days.

In winter, the average temperature is 53 degrees F and the average daily minimum temperature is 37 degrees F. The lowest temperature on record, which occurred at Casa Grande on December 24, 1974, is 15 degrees F. In summer the average temperature is 105 degrees F. The highest recorded temperature, which occurred on June 27, 1979, is 119 degrees F.

Of the total annual precipitation, 4 inches, or 45 percent, usually falls in April through September, which includes the growing season for most crops. In two years out of ten, the rainfall in April through September is less than 3 inches. The heaviest one-day rainfall during the period of record was 3.42 inches at Casa Grande on August 12, 1964. Thunderstorms occur about 23 days each year, and most occur late in summer.

Snowfall is rare. In 99 percent of the winters, there is no measurable snowfall. In one percent there is only a trace of snowfall, which usually is of short duration.

The average relative humidity in midafternoon is about 25 percent. Humidity is higher at night, and the average at dawn is about 50 percent. The sun shines 85 percent of the time possible in summer and 70 percent in winter. The prevailing wind is from the east. Average wind speed is highest, 7 miles per hour, in summer.

4.3.2 Soil Map Units

The map units delineated on Figure 4-2 represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the figure, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit is given under Use and Management of the Soils.

A map unit delineation represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils or miscellaneous areas. Within a taxonomic class there are precisely defined limits for the properties of the soils. However, on the landscape, the soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some "included" areas that belong to other taxonomic classes.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation to precisely define and locate the soils and miscellaneous areas is needed.

The following descriptions of the soil map units are a brief synopsis of each classified soil per the *Soil Survey of Pinal County, Arizona, Western Part*. For a detailed understanding of each soil unit, refer to that document.

4.3.2.1 7-Cherioni-Rock outcrop complex, 5 to 60 percent slopes

This map unit is on hillslopes and mountain slopes. Elevation is 1,200 to 4,375 feet. This unit is 55 percent Cherioni very cobbly very fine sandy loam and 25 percent Rock outcrop. The Cherioni soil is on back slopes and foot slopes, and Rock outcrop is on the higher parts of the hills. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

The Cherioni soil is very shallow and is somewhat excessively drained. It formed in very cobbly slope alluvium derived dominantly from basalt. Typically, 40 to 65 percent of the surface is covered with cobbles, hardpan fragments, and pebbles. The surface layer is light brown very cobbly very fine sandy loam about 1 inch thick. The next layer is brown and light brown very gravelly very fine sandy loam about 7 inches thick. Below this is a silica- and lime-cemented hardpan about 2 inches thick. Basalt is at a depth of 10 inches. Depth to the silica- and lime-cemented hardpan ranges from 5 to 20 inches. Depth to rock ranges from 6 to 20 inches.

Permeability of the Cherioni soil is moderate. Available water capacity is very low. Potential rooting depth is 5 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

Rock outcrop consists of exposed areas of basalt and andesite.

The potential native plant community on this unit is desertic shrubs and a small percentage of perennial grasses. The present vegetation is white brittlebush, littleleaf paloverde, triangle bursage, a variety of cacti, and numerous perennial and annual forbs.

4.3.2.2 13-Dateland fine sandy loam

This deep, well-drained soil is on fan terraces and stream terraces. It formed in fan and stream alluvium derived from mixed sources. Slope is 0 to 1 percent. Elevation is 1,140 to 2,000 feet.

Typically, the surface layer is light yellowish brown fine sandy loam about 2 inches thick. The subsoil is light yellowish brown and strong brown fine sandy loam 13 inches thick. The next layer is strong brown very fine sandy loam 25 inches thick. The substratum to a depth of 60 inches or more is strong brown sandy loam.

Permeability of this Dateland soil is moderate. Available water capacity also is moderate. Potential rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate. Areas of this unit on stream terraces are subject to rare periods of flooding during high-intensity summer storms and prolonged winter rains.

The potential native plant community on this unit is desertic shrubs, cacti, and a small percentage of annual and perennial grasses and forbs. The present vegetation is creosotebush, triangle bursage, annual grasses, and forbs.

4.3.2.3 15-Denure very gravelly sandy loam, 1 to 8 percent slopes

This deep, somewhat excessively drained soil is on fan terraces. It formed in fan alluvium derived from mixed sources. Elevation is 1,140 to 2,000 feet.

Typically, the surface layer is light brown very gravelly sandy loam about 8 inches thick. The next 46 inches is light brown sandy loam and fine sandy loam. Below this to a depth of 60 inches or more is reddish brown sandy clay loam. Soft masses of lime are below a depth of about 19 inches.

Permeability of this Denure soil is moderately rapid. Available water capacity is moderate. Potential rooting depth is 60 inches or more. Runoff is medium, and the hazard of water erosion is slight. The hazard of soil blowing is slight.

The potential native plant community is a mixture of desertic shrubs and trees with an understory of perennial grasses. The present vegetation is littleleaf paloverde, triangle bursage, white bursage, ratany, creosotebush, bush muhly, and a variety of cacti, annual grasses, and forbs.

4.3.2.4 16-Denure sandy loam, 1 to 3 percent slopes

This deep, somewhat excessively drained soil is on fan terraces. It formed in fan alluvium derived from mixed sources. Elevation is 1,140 to 2,000 feet.

Typically, the surface layer is light brown sandy loam about 2 inches thick. The next 52 inches is light brown sandy loam and fine sandy loam. Below this to a depth of 60 inches or more is reddish brown sandy clay loam. This layer is 5 to 30 percent pebbles. A few soft masses of lime are below a depth of about 19 inches.

Permeability of this Denure soil is moderately rapid. Available water capacity is moderate. Potential rooting depth is 60 inches or more. Runoff is medium, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

The potential native plant community on this unit is desertic shrubs and cacti and a small percentage of annual and perennial grasses and forbs. The present vegetation is creosotebush, triangle bursage, and annual grasses and forbs.

4.3.2.5 17-Denure fine sandy loam, 0 to 1 percent slopes

This deep, somewhat excessively drained soil is on stream terraces. It formed in stream alluvium derived from mixed sources. Elevation is 1,140 to 2,000 feet.

Typically, the surface layer is light brown fine sandy loam about 2 inches thick. The next 52 inches is light brown sandy loam and fine sandy loam. Below this to a depth of 60 inches or more is reddish brown sandy clay loam. Soft masses of lime are below a depth of about 19 inches.

Permeability of this Denure soil is moderately rapid. Available water capacity is moderate. Potential rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

The potential native plant community on this unit is desertic shrubs and cacti and a small percentage of annual and perennial grasses and forbs. The present vegetation is creosotebush, triangle bursage, and annual grasses and forbs.

4.3.2.6 19-Dumps-Pits association

This unit is on a gently sloping fan terrace northwest of Casa Grande. The deposits of material have nearly level to gently sloping tops and very steep side slopes. They are deep and well drained. Elevation ranges from 1,350 to 1,500 feet.

This unit is about 59 percent stony, unprocessed overburden; 29 percent chemically treated mine tailings, or slickens; 11 percent open pit mine; and 1 percent slag dumps.

Dumps are characterized by the stony, unprocessed overburden that has been dumped near a pit mine. It consists of rock fragments blasted out of a pit mine to expose copper-bearing ore. The areas of chemically treated mine tailings are sedimentation basins for smelter wastes that are easily transported by water. This material resembles reddish brown sandy loam. The open pit mine is characterized by a series of benches 50 to 75 feet high in copper-ore producing rock. It is about 500 feet deep and 0.5 mile in diameter at the top. The slag dumps are areas where molten smelter refuse has been dumped. The refuse resembles solid black rock.

Overburden material and mine tailings should be investigated for stability and settlement before they are used as building sites. The low acidity of the material is also a concern. The overburden material and crushed slag can be used to fill in low areas to be used as sites for homes, streets, railroads, and flood control dikes.

4.3.2.7 25-Gunsight-Cipriano complex, 1 to 8 percent slopes

This map unit is on fan terraces. Elevation is 1,140 to 2,000 feet.

This unit is 50 percent Gunsight very gravelly fine sandy loam and 40 percent Cipriano cobbly loam. The Gunsight soil is on the lower end of the terraces, and the Cipriano soil is on the higher end of the terraces. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

The Gunsight soil is deep and somewhat excessively drained. It formed in very gravelly fan alluvium derived from mixed sources. Slope is 2 to 6 percent. Typically, the surface layer is light brown very gravelly fine sandy loam about 3 inches thick. The next layer is pink gravelly loam 9 inches thick. Below this to a depth of 60 inches or more is calcareous, light brown very gravelly loam. The depth to a layer of lime accumulation ranges from 10 to 20 inches.

Permeability of the Gunsight soil is moderate. Available water capacity is low. Potential rooting depth is 60 inches or more. Runoff is medium, and the hazard of water erosion is slight. The hazard of soil blowing is slight. This soil is slightly saline throughout and is moderately sodic or strongly sodic below a depth of 30 inches.

The Cipriano soil is very shallow and shallow and is somewhat excessively drained. It formed in very gravelly and cobbly fan alluvium derived from mixed sources. Slope is 1 to 8 percent. Typically, 10 to 20 percent of the surface is covered with cobbles and pebbles. The surface layer is very pale brown cobbly loam about 2 inches thick. Below this is light brown very gravelly loam about 7 inches thick. An indurated silica-cemented hardpan is at a depth of 9 inches. The depth to the hardpan ranges from 8 to 20 inches.

Permeability of the Cipriano soil is moderate. Available water capacity is very low. Potential rooting depth is 8 to 20 inches. Runoff is medium, and the hazard of water erosion is slight. The hazard of soil blowing is slight.

The potential native plant community on this unit is shrubs and cacti. The present vegetation is creosotebush, bursage, fluffgrass, threeawn, a number of annual grasses, and forbs. Various perennial trees, shrubs, half-shrubs, succulents, and woody vines are also present.

4.3.2.8 30-Mohall sandy loam

This deep, well-drained soil is on fan terraces and relict basin floors. It formed in fan alluvium derived from mixed sources. Slope is 0 to 1 percent. Elevation is 1,140 to 2,000 feet.

Typically, the surface layer is light brown sandy loam about 16 inches thick. The subsoil is light brown sandy clay loam 27 inches thick. The substratum to a depth of 60 inches or more is pink sandy loam. Soft masses of lime are in the lower part of the subsoil.

Permeability of this Mohall soil is moderately slow. Available water capacity is high. Potential rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

The potential native plant community on this unit is desertic shrubs and trees with an understory of perennial grasses. The present vegetation is littleleaf paloverde, triangle bursage, white bursage, ratany, creosotebush, bush muhly, and a variety of cacti and annual grasses and forbs.

4.3.2.9 33-Mohall-Denure association

This map unit is on fan terraces. Elevation is 1,140 to 2,000 feet. Slope is 1 to 3 percent.

This unit is 45 percent Mohall sandy loam and 45 percent Denure sandy loam.

The Mohall soil is deep and well drained. It formed in fan alluvium derived from mixed sources. Typically, the surface layer is light brown sandy loam about 16 inches thick. The next layer is light brown sandy clay loam about 27 inches thick. Below this to a depth of 60 inches or more is pink sandy loam. Soft masses of lime are at a depth of 24 to 40 inches.

Permeability of the Mohall soil is moderately slow. Available water capacity is high. Potential rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

The Denure soil is deep and somewhat excessively drained. It formed in fan alluvium derived from mixed sources. Typically, the surface layer is light brown sandy loam about 2 inches thick. The next 52 inches is light brown sandy loam and fine sandy loam. Below this to a depth of 60 inches or more is reddish brown sandy clay. The lower layer is 5 to 30 percent pebbles. Soft masses of lime are below a depth of about 19 inches.

Permeability of the Denure soil is moderately rapid. Available water capacity is moderate. Potential rooting depth is 60 inches or more. Runoff is medium, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

The potential native plant community is desertic shrubs and trees with an understory of perennial grasses. The present vegetation is littleleaf paloverde, triangle bursage, white bursage, ratany, creosotebush, bush muhly, and a variety of cacti and annual grasses and forbs.

4.3.2.10 34-Momoli-Carrizo complex, 1 to 8 percent slopes

This map unit is on fan terraces and flood plains. Elevation is 1,140 to 2,000 feet.

This unit is 60 percent Momoli very gravelly fine sandy loam and 20 percent Carrizo very gravelly fine sandy loam. The Momoli soil is on the fan terraces, and the Carrizo soil is on the flood plains. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

The Momoli soil is deep and somewhat excessively drained. It formed in very gravelly fan alluvium derived from mixed sources. Slope is 1 to 8 percent. Typically, 15 to 30 percent of the surface is covered with fine pebbles. The surface layer is light brown very gravelly fine sandy loam about 2 inches thick. The next layer is very gravelly sandy loam about 32 inches thick. Below this to a depth of 60 inches or more is light brown very gravelly loamy sand.

Permeability of the Momoli soil is moderately rapid. Available water capacity is very low. Potential rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is slight. This soil is slightly saline.

The Carrizo soil is deep and excessively drained. It formed in very gravelly, coarse textured stream and fan alluvium derived from mixed sources. Slope is 1 to 5 percent. Typically, 30 to 50 percent of the surface is covered with fine pebbles. The surface layer is light yellowish brown very gravelly fine sandy loam about 5 inches thick. Below this to a depth of 60 inches or more is light yellowish brown and brown very gravelly coarse sand and extremely gravelly coarse sand.

Permeability of the Carrizo soil is very rapid. Available water capacity is very low. Potential rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is slight. The soil is subject to occasional, brief periods of flooding in summer and winter.

The potential native plant community on the Momoli soil is desertic shrubs, cacti, and annual and perennial grasses and forbs. The present vegetation on this soil is creosotebush, paloverde, triangle bursage, various cacti, seasonal grasses, and forbs.

4.3.2.11 37-Pinamt-Momoli complex, 1 to 8 percent slopes

This map unit is on fan terraces. Elevation is 1,200 to 2,000 feet.

This unit is 50 percent Pinamt very gravelly loam and 30 percent Momoli very gravelly fine sandy loam. The Pinamt soil is on the higher part of fan terraces, and the Momoli soil is on the lower part of fan terraces. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

The Pinamt soil is deep and well drained. It formed in very gravelly fan alluvium derived from mixed sources. Slope is 1 to 8 percent. Typically, 40 to 70 percent of the surface is covered with desert

varnished pebbles. The surface layer is light brown very gravelly loam about 2 inches thick. The subsoil is yellowish red and light reddish brown very gravelly clay loam and very gravelly sandy clay loam 21 inches thick. Below this to a depth of 60 inches or more is light brown very gravelly sandy loam and extremely gravelly sandy loam. Soft masses of lime are at a depth of about 10 inches.

Permeability of the Pinamt soil is moderately slow. Available water capacity is low. Potential rooting depth is 60 inches or more. Runoff is medium, and the hazard of water erosion is slight. The hazard of soil blowing is slight.

The Momoli soil is deep and somewhat excessively drained. It formed in very gravelly fan alluvium derived from mixed sources. Slope is 1 to 5 percent. Typically, 30 to 40 percent of the surface is covered with pebbles. The surface layer is light brown very gravelly fine sandy loam about 2 inches thick. The next 32 inches is light brown very gravelly sandy loam. Below this to a depth of 60 inches or more is light brown very gravelly loamy sand.

Permeability of the Momoli soil is moderately rapid. Available water capacity is very low. Potential rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is slight.

The potential native plant community on the Pinamt soil is perennial grasses, desertic shrubs, and cacti. The present vegetation is triangle bursage, creosotebush, paloverde, brittlebush, fluffgrass, and buckhorn cholla.

4.3.2.12 39-Quilotosa-Rock outcrop complex, 5 to 60 percent slopes

This map unit is on hillslopes and mountain slopes. Elevation is 1,200 to 3,200 feet.

This unit is 50 percent Quilotosa extremely stony loam and 35 percent Rock outcrop. The Quilotosa soil is on the less sloping parts of granite hills. The Rock outcrop is in the steeper areas and on the higher peaks. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

The Quilotosa soil is very shallow and is somewhat excessively drained. It formed in eolian material and in slope alluvium derived dominantly from granite and gneiss. Typically, 50 to 80 percent of the surface is covered with pebbles, cobbles, stones, and boulders. The surface layer is pale brown extremely stony loam about 2 inches thick. The next 8 inches is brown extremely gravelly sandy loam. Below this to a depth of 18 inches is soft, weathered granite. Unweathered granite is at a depth of 18 inches.

Permeability of the Quilotosa soil is moderately rapid. Available water capacity is very low. Potential rooting depth is 4 to 20 inches. Runoff is medium, and the hazard of water erosion is slight. The hazard of soil blowing is slight.

Rock outcrop consists of exposed areas of granite with small areas of schist and rhyolite.

The potential native plant community is desertic shrubs with an understory of perennial and annual grasses and forbs. The present vegetation is littleleaf paloverde, brittlebush, slim tridens, threeawn, and other forbs, grasses, cacti, and shrubs.

4.3.2.13 44-Tremant-Denure complex

This map unit is on fan terraces. Elevation is 1,200 to 2,000 feet. Slope is 1 to 3 percent.

This unit is 45 percent Tremant gravelly loam and 35 percent Denure sandy loam.

The Tremant soil is deep and well drained. It formed in gravelly fan alluvium derived from mixed sources. Typically, 30 to 50 percent of the surface is covered with fine pebbles. The surface layer is light brown gravelly loam 2 inches thick. The next layer is brown loam 3 inches thick over brown and light brown gravelly clay loam 31 inches thick. Below this to a depth of 60 inches or more is light brown gravelly sandy clay loam. Soft masses of lime are below a depth of about 5 inches.

Permeability of the Tremant soil is moderately slow. Available water capacity is high. Potential rooting depth is 60 inches or more. Runoff is medium, and the hazard of water erosion is slight. The hazard of soil blowing is slight. This soil is slightly saline.

The Denure soil is deep and somewhat excessively drained. It formed in fan alluvium derived from mixed sources. Typically, the surface layer is light brown sandy loam about 2 inches thick. The next 52 inches is light brown sandy loam and fine sandy loam. Below this to a depth of 60 inches or more is reddish brown sandy clay loam that is 5 to 30 percent pebbles. Soft masses of lime are below a depth of about 19 inches.

Permeability of the Denure soil is moderately rapid. Available water capacity is moderate. Potential rooting depth is 60 inches or more. Runoff is medium, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

The potential native plant community is desertic shrubs, cacti, and an intermittent understory of perennial and annual grasses and forbs. Triangle bursage and creosotebush are the dominant plants.

4.3.2.14 46-Vaiva-Rock outcrop complex, 2 to 15 percent slopes

This map unit is on hillslopes and mountain slopes. Elevation is 1,200 to 2,000 feet.

This unit is 55 percent Vaiva very gravelly loam and 20 percent Rock outcrop. The Rock outcrop is in the steeper areas of the hillslopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

The Vaiva soil is very shallow and is well drained. It formed in eolian material and in slope alluvium derived dominantly from granite and gneiss. Typically, 30 to 50 percent of the surface is covered with pebbles, cobbles, and stones. The surface layer is brown very gravelly loam about 4 inches thick. The subsoil is brown and light brown very gravelly sandy clay loam and extremely gravelly sandy clay loam about 12 inches thick. Granite is at a depth of 16 inches. Depth to rock ranges from 4 to 20 inches.

Permeability of the Vaiva soil is moderate. Available water capacity is very low. Potential rooting depth is 4 to 20 inches. Runoff is medium, and the hazard of water erosion is slight. The hazard of soil blowing is slight. Rock outcrop consists of exposed granite with small areas of schist and rhyolite.

The potential native plant community on this unit is desertic shrubs with an understory of perennial and annual grasses and forbs. The present plant community is littleleaf paloverde, brittlebush, slim tridens, threeawn, and other forbs, grasses, cacti, and shrubs.

4.3.2.15 47-Vaiva-Rock outcrop complex, 15 to 50 percent slopes

This map unit is on hillslopes and mountain slopes. Elevation is 1,200 to 3,200 feet.

This unit is 50 percent Vaiva extremely stony sandy loam and 30 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

The Vaiva soil is very shallow and shallow and is well drained. It formed in eolian material and slope alluvium derived dominantly from granite and gneiss. Typically, 60 to 70 percent of the surface is covered with stones and cobbles. The surface layer is brown extremely stony sandy loam about 4 inches thick. The subsoil is brown and light brown very gravelly sandy clay loam and extremely gravelly sandy clay loam about 12 inches thick. Granite is at a depth of 16 inches. Depth to rock ranges from 4 to 20 inches.

Permeability of the Vaiva soil is moderate. Available water capacity is very low. Effective rooting depth is 4 to 20 inches. Runoff is medium, and the hazard of water erosion is slight. The hazard of soil blowing is slight.

Rock outcrop consists of exposed granite with some small areas of schist and rhyolite.

The potential native plant community on this unit is desertic shrubs with an understory of perennial and annual grasses and forbs. The present plant community is littleleaf paloverde, brittlebush, slim tridens, threeawn, forbs, grasses, cacti, and shrubs.

4.3.2.16 48-Valencia sandy loam

This deep, well-drained soil is on flood plains and alluvial fans. It formed in stream and fan alluvium deposited over older alluvium derived from mixed sources. Elevation is 1,140 to 2,000 feet. Slope is 0 to 1 percent.

Typically, the surface layer is light yellowish brown sandy loam about 8 inches thick. The next 20 inches is light brown sandy loam. The next 18 inches is light reddish brown and reddish brown loam and sandy clay loam. Below this to a depth of 60 inches or more is pink sandy loam. Soft masses of lime are below a depth of about 17 inches.

Permeability of this Valencia soil is moderately rapid to a depth of 28 inches and moderately slow below this depth. Available water capacity is moderately high. Potential rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate. This soil is occasionally flooded for very brief periods in summer and winter. It is slightly sodic or moderately sodic and non-saline or slightly saline.

The potential native plant community on this unit is desertic shrubs and trees with an understory of perennial grasses. The present vegetation is littleleaf paloverde, triangle bursage, white bursage, ratany, creosotebush, bush muhly, and a variety of cacti, annual grasses, and forbs.

4.3.2.17 49-Why sandy loam

This deep, somewhat excessively drained soil is on alluvial fans and flood plains. It formed in stream and fan alluvium derived from mixed sources. Elevation is 1,140 to 2,000 feet. Slope is 0 to 1 percent.

Typically, the surface layer is light yellowish brown sandy loam about 2 inches thick. Below this to a depth of 60 inches or more is light yellowish brown, light brown, and strong brown sandy loam. Soft accumulations of lime are in the root channels and pores and on the underside of pebbles below a depth of 15 inches.

Permeability of the Why soil is moderately rapid. Available water capacity is moderate. Potential rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate. This unit is occasionally flooded for very brief periods in summer and winter.

The potential native plant community is a diverse mixture of perennial grasses and forbs, desertic trees and shrubs, and annual grasses. The present vegetation consists of paloverde, ironwood, mesquite, creosotebush, and big sagebrush. Perennial grasses, such as bush muhly, threeawn, slim tridens, and numerous annual grasses are also present. Among the most common perennial forbs present are globemallow, wirelettuce, fiddleneck, scorpion weed, hairy Bowlesia, and Indianwheat.

4.4 Use and Management of the Soils

Information in this section can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties. Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

4.4.1 Recreation

The soils of the survey area are rated in Tables 4-1 through 4-4 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In Tables 4-1 through 4-4, the degree of soil limitation is expressed as slight, moderate, or severe. Slight means that soil properties generally are favorable and that limitations are minor and easily overcome. Moderate means that limitations can be overcome or alleviated by planning, design, or special maintenance. Severe means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

4.4.1.1 Paths and Trails Areas

Paths and trails for hiking and horseback riding (non-motorized, single-track) should require little or no slope modification through cutting and filling.

The ratings in Table 4-1 are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

| No. | Map unit | Rating | Rating reasons (numeric values)* |
|-----|--|------------------|---|
| 7 | Cherioni-Rock outcrop complex, 5-60% slopes | Very limited | Slope (1.00), Large stones content (0.77), Dusty (0.10) |
| 13 | Dateland fine sandy loam | Somewhat limited | Dusty (0.01) |
| 15 | Denure very gravelly sandy loam, 1-8% slopes | Somewhat limited | Dusty (0.03) |
| 16 | Denure sandy loam, 1-3% slopes | Somewhat limited | Dusty (0.04) |
| 17 | Denure fine sandy loam, 1-3% slopes | Somewhat limited | Dusty (0.04) |
| 19 | Dumps-Pits association | Not rated | |
| 25 | Gunsight-Cipriano complex, 1-8% slopes | Somewhat limited | Gunsight-Dusty (0.24) |
| | | | Cipriano-Dusty (0.28) |
| 30 | Mohall sandy loam | Somewhat limited | Dusty (0.08) |
| 33 | Mohall-Denure association | Somewhat limited | Mohall-Dusty (0.08) |
| | | | Denure-Dusty (0.04) |
| 34 | Momoli-Carrizo complex, 1-8% slopes | Somewhat limited | Momoli-Dusty (0.02) |
| | | | Carrizo-Too sandy (0.00) |
| 37 | Pinamt-Momoli complex, 1-8% slopes | Somewhat limited | Pinamt-Dusty (0.35) |
| | | | Momoli-Dusty (0.04) |
| 39 | Quilotosa-Rock outcrop complex, 5-60% slopes | Very limited | Slope (1.00), Large stones content (0.77) |
| 44 | Tremant-Denure complex | Somewhat limited | Tremant-Dusty (0.36) |
| | | | Denure-Dusty (0.04) |
| 46 | Vaiva-Rock outcrop complex, 2-15% slopes | Somewhat limited | Dusty (0.18) |
| 47 | Vaiva-Rock outcrop complex, 15-50% slopes | Very limited | Slope (1.00), Large stones content (1.00) |
| 48 | Valencia sandy loam | Somewhat limited | Dusty (0.03) |
| 49 | Why sandy loam | Somewhat limited | Dusty (0.02) |

* Rating threshold of 0.10 and greater, except for single reason ratings of less than 0.10, which are displayed.

4.4.1.2 Off-Road Motorcycle Trails

Off-road motorcycle (motorized, single-track) trails are intended primarily for recreational use. They require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely.

The ratings in Table 4-2 are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

| Table 4-2-Off-Road Motorcycle Areas Suitabilities and Limitations Ratings | | | |
|--|--|------------------|--|
| No. | Map unit | Rating | Rating reasons (numeric values)* |
| 7 | Cherioni-Rock outcrop complex, 5-60% slopes | Somewhat limited | Large stones content (1.00), Slope (0.56), Dusty (0.10) |
| 13 | Dateland fine sandy loam | Somewhat limited | Dusty (0.01) |
| 15 | Denure very gravelly sandy loam, 1-8% slopes | Somewhat limited | Dusty (0.03) |
| 16 | Denure sandy loam, 1-3% slopes | Somewhat limited | Dusty (0.04) |
| 17 | Denure fine sandy loam, 1-3% slopes | Somewhat limited | Dusty (0.04) |
| 19 | Dumps-Pits association | Not rated | |
| 25 | Gunsight-Cipriano complex, 1-8% slopes | Somewhat limited | Gunsight-Dusty (0.24) |
| | | | Cipriano-Dusty (0.28) |
| 30 | Mohall sandy loam | Somewhat limited | Dusty (0.08) |
| 33 | Mohall-Denure association | Somewhat limited | Mohall-Dusty (0.08) |
| | | | Denure-Dusty (0.04) |
| 34 | Momoli-Carrizo complex, 1-8% slopes | Somewhat limited | Momoli-Dusty (0.02) |
| | | | Carrizo-Too sandy (0.00) |
| 37 | Pinamt-Momoli complex, 1-8% slopes | Somewhat limited | Pinamt-Dusty (0.35) |
| | | | Momoli-Dusty (0.04) |
| 39 | Quilotosa-Rock outcrop complex, 5-60% slopes | Somewhat limited | Large stones content (0.77), Slope (0.56) |
| 44 | Tremant-Denure complex | Somewhat limited | Tremant-Dusty (0.36) |
| | | | Denure-Dusty (0.04) |
| 46 | Vaiva-Rock outcrop complex, 2-15% slopes | Somewhat limited | Vaiva-Dusty (0.18) |
| 47 | Vaiva-Rock outcrop complex, 15-50% slopes | | Rock outcrop-Large stones content (1.00), Slope (0.56), Dusty (0.12) |
| 48 | Valencia sandy loam | Somewhat limited | Dusty (0.03) |
| 49 | Why sandy loam | Somewhat limited | Dusty (0.02) |

* Rating threshold of 0.10 and greater, except for single reason ratings of less than 0.10, which are displayed.

4.4.1.3 Camping Areas

Camp areas are tracts of land used intensively as sites for tents, trailers, campers, and the accompanying activities of outdoor living. Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic.

The ratings in Table 4-3 are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties

that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, saturated hydraulic conductivity (Ksat), and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, saturated hydraulic conductivity (Ksat), and toxic substances in the soil.

Table 4-3. Camping Areas Suitabilities and Limitations Ratings

| No. | Map unit | Rating | Rating reasons (numeric values)* |
|-----|--|------------------|--|
| 7 | Cherioni-Rock outcrop complex, 5-60% slopes | Very limited | Depth to cemented pan (1.00), Slope (1.00), Depth to bedrock (1.00), Large stones content (0.77) |
| 13 | Dateland fine sandy loam | Very limited | Flooding (1.00) |
| 15 | Denure very gravelly sandy loam, 1-8% slopes | Somewhat limited | Gravel content (0.68) |
| 16 | Denure sandy loam, 1-3% slopes | Somewhat limited | Dusty (0.04) |
| 17 | Denure fine sandy loam, 1-3% slopes | Somewhat limited | Dusty (0.04) |
| 19 | Dumps-Pits association | Not rated | |
| 25 | Gunsight-Cipriano complex, 1-8% slopes | Very limited | Gunsight–Sodium content (1.00), Gravel content (1.00), Dusty (0.24) |
| | | | Cipriano–a Depth to cemented pan (1.00), Slow water movement (1.00), Dusty (0.28) |
| 30 | Mohall sandy loam | Somewhat limited | Slow water movement (0.15) |
| 33 | Mohall-Denure association | Somewhat limited | Mohall–a Slow water movement (0.15) |
| | | | Denure–a Dusty (0.04) |
| 34 | Momoli-Carrizo complex, 1-8% slopes | Very limited | Gravel content (1.00) |
| | | | Flooding (1.00), Gravel content (1.00) |
| 37 | Pinamt-Momoli complex, 1-8% slopes | Very limited | Pinamt–Gravel content (1.00), Dusty (0.35), Slow water movement (0.15) |
| | | | Momoli–Gravel content (1.00) |
| 39 | Quilotosa-Rock outcrop complex, 5-60% slopes | Very limited | Slope (1.00), Depth to bedrock (1.00), Large stones content (0.77) |
| 44 | Tremant-Denure complex | Very limited | Sodium content (1.00), Dusty (0.36), Slow water movement (0.15) |
| 46 | Vaiva-Rock outcrop complex, 2-15% slopes | Very limited | Gravel content (1.00), Depth to bedrock (1.00), Dusty (0.18), Slow water movement (0.15) |
| 47 | Vaiva-Rock outcrop complex, 15-50% slopes | Very limited | Slope (1.00), Depth to bedrock (1.00), Large stones content (1.00), Dusty (0.12) |
| 48 | Valencia sandy loam | Very limited | Flooding (1.00), Sodium content (1.00), Slow water movement (0.15) |
| 49 | Why sandy loam | Very limited | Flooding (1.00) |

* Rating threshold of 0.10 and greater, except for single reason ratings of less than 0.10, which are displayed.

4.4.1.4 Picnic/Playground Areas

Picnic/Playground areas are natural or landscaped tracts used primarily for preparing meals, eating outdoors, and kids' playgrounds. These areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas.

The ratings in Table 4-4 are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, saturated hydraulic conductivity (Ksat), and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, saturated hydraulic conductivity (Ksat), and toxic substances in the soil.

| Table 4-4-Picnic/Playground Areas Suitabilities and Limitations Ratings | | | |
|--|--|------------------|--|
| No. | Map unit | Rating | Rating reasons (numeric values)* |
| 7 | Cherioni-Rock outcrop complex, 5-60% slopes | Very limited | Depth to cemented pan (1.00), Slope (1.00), Depth to bedrock (1.00), Large stones content (0.77), Dusty (0.10) |
| 13 | Dateland fine sandy loam | Somewhat limited | Dusty (0.01) |
| 15 | Denure very gravelly sandy loam, 1-8% slopes | Somewhat limited | Dusty (0.03) |
| 16 | Denure sandy loam, 1-3% slopes | Somewhat limited | Dusty (0.04) |
| 17 | Denure fine sandy loam, 1-3% slopes | Somewhat limited | Dusty (0.04) |
| 19 | Dumps-Pits association | Not rated | |
| 25 | Gunsight-Cipriano complex, 1-8% slopes | Very limited | Gunsight-Sodium content (1.00), Gravel content (1.00), Dusty (0.24) |
| | | | Cipriano-Slow water movement (1.00), Depth to cemented pan (1.00), Dusty (0.28) |
| 30 | Mohall sandy loam | Somewhat limited | Dusty (0.08) |
| 33 | Mohall-Denure association | Somewhat limited | Mohall-Dusty (0.08) |
| | | | Denure-Dusty (0.04) |
| 34 | Momoli-Carrizo complex, 1-8% slopes | Very limited | Momoli-Gravel content (1.00) |
| | | | Carrizo-Gravel content (1.00) |
| 37 | Pinamt-Momoli complex, 1-8% slopes | Somewhat limited | Pinamt-Dusty (0.35) |
| | | | Momoli-Dusty (0.04) |
| 39 | Quilotosa-Rock outcrop complex, 5-60% slopes | Very limited | Slope (1.00), Large stones content (0.77) |
| 44 | Tremant-Denure complex | Somewhat limited | Tremant-Dusty (0.36) |
| | | | Denure-Dusty (0.04) |
| 46 | Vaiva-Rock outcrop complex, 2-15% slopes | Very limited | Gravel content (1.00), Depth to bedrock (1.00), Dusty (0.18), Slow water movement (0.15) |
| 47 | Vaiva-Rock outcrop complex, 15-50% slopes | Very limited | Slope (1.00), Large stones content (1.00), Dusty (0.12) |
| 48 | Valencia sandy loam | Somewhat limited | Dusty (0.03) |
| 49 | Why sandy loam | Somewhat limited | Dusty (0.02) |

* Rating threshold of 0.10 and greater, except for single reason ratings of less than 0.10, which are displayed.

4.4.2 Land Management

The soils of the survey area are rated in Tables 4-5 through 4-6 according to limitations that affect their suitability for land management practices. Land management interpretations are tools designed to guide the user in evaluating existing conditions in planning and predicting the soil response to various land management practices for a variety of land uses.

4.4.2.1 Erosion Hazard (Road and Trail)

The ratings in this interpretation indicate the hazard of soil loss from unsurfaced roads and trails (motorized, two-track). The ratings in Table 4-5 are based on soil erosion factor K, slope, and content of rock fragments.

| No. | Map unit | Rating | Rating reasons (numeric values)* |
|-----|--|-----------|----------------------------------|
| 7 | Cherioni-Rock outcrop complex, 5-60% slopes | Severe | Slope/erodibility (0.95) |
| 13 | Dateland fine sandy loam | Slight | |
| 15 | Denure very gravelly sandy loam, 1-8% slopes | Moderate | Slope/erodibility (0.50) |
| 16 | Denure sandy loam, 1-3% slopes | Slight | |
| 17 | Denure fine sandy loam, 1-3% slopes | Slight | |
| 19 | Dumps-Pits association | Not rated | |
| 25 | Gunsight-Cipriano complex, 1-8% slopes | Slight | |
| 30 | Mohall sandy loam | Slight | |
| 33 | Mohall-Denure association | Slight | |
| 34 | Momoli-Carrizo complex, 1-8% slopes | Moderate | Slope/erodibility (0.50) |
| 37 | Pinamt-Momoli complex, 1-8% slopes | Moderate | Slope/erodibility (0.50) |
| 39 | Quilotosa-Rock outcrop complex, 5-60% slopes | Severe | Slope/erodibility (0.95) |
| 44 | Tremant-Denure complex | Slight | |
| 46 | Vaiva-Rock outcrop complex, 2-15% slopes | Moderate | Slope/erodibility (0.50) |
| 47 | Vaiva-Rock outcrop complex, 15-50% slopes | Severe | Slope/erodibility (0.95) |
| 48 | Valencia sandy loam | Slight | |
| 49 | Why sandy loam | Slight | |

* Rating threshold of 0.10 and greater, except for single reason ratings of less than 0.10, which are displayed.

4.4.2.2 Erosion Hazard (Off Established Roads and Trails)

The ratings in this interpretation indicate the hazard of soil loss from travel off established roads and trails areas after disturbance activities that expose the soil surface. The ratings in Table 4-6 are based on slope and soil erosion factor K. The soil loss is caused by sheet or rill erosion in off-road or off-

trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance.

| Table 4-6-Erosion Hazard (Off Established Road and Trail) Suitabilities and Limitations Ratings | | | |
|--|--|---------------|---|
| No. | Map unit | Rating | Rating reasons (numeric values)* |
| 7 | Cherioni-Rock outcrop complex, 5-60% slopes | Moderate | Slope/erodibility (0.50) |
| 13 | Dateland fine sandy loam | Slight | |
| 15 | Denure very gravelly sandy loam, 1-8% slopes | Slight | |
| 16 | Denure sandy loam, 1-3% slopes | Slight | |
| 17 | Denure fine sandy loam, 1-3% slopes | Slight | |
| 19 | Dumps-Pits association | Not rated | |
| 25 | Gunsight-Cipriano complex, 1-8% slopes | Slight | |
| 30 | Mohall sandy loam | Slight | |
| 33 | Mohall-Denure association | Slight | |
| 34 | Momoli-Carrizo complex, 1-8% slopes | Slight | |
| 37 | Pinamt-Momoli complex, 1-8% slopes | Slight | |
| 39 | Quilotosa-Rock outcrop complex, 5-60% slopes | Moderate | Slope/erodibility (0.50) |
| 44 | Tremant-Denure complex | Slight | |
| 46 | Vaiva-Rock outcrop complex, 2-15% slopes | Slight | |
| 47 | Vaiva-Rock outcrop complex, 15-50% slopes | Moderate | Slope/erodibility (0.50) |
| 48 | Valencia sandy loam | Slight | |
| 49 | Why sandy loam | Slight | |

* Rating threshold of 0.10 and greater, except for single reason ratings of less than 0.10, which are displayed.

4.4.3 Building Site Development

The soils of the survey area are rated in Tables 4-7 through 4-9 according to limitations that affect their suitability for building site development. The limitations are considered slight if soil properties and site features generally are favorable for the indicated use and limitations are minor and easily overcome; moderate if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and severe if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

4.4.3.1 Small Structures on Grade (without Basements)

Small structures on grade are buildings of three stories or less. Examples include picnic ramadas, range canopies, park operations and maintenance buildings, and concessionaire operations. For buildings without basements, the foundation is assumed to consist of spread footings of reinforced

concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper.

The ratings in Table 4-7 are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification of the soil. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

| No. | Map unit | Rating | Rating reasons (numeric values)* |
|------------|--|------------------|--|
| 7 | Cherioni-Rock outcrop complex, 5-60% slopes | Very limited | Depth to hard bedrock (1.00), Slope (1.00) |
| 13 | Dateland fine sandy loam | Very limited | Flooding (1.00) |
| 15 | Denure very gravelly sandy loam, 1-8% slopes | Not limited | |
| 16 | Denure sandy loam, 1-3% slopes | Not limited | |
| 17 | Denure fine sandy loam, 1-3% slopes | Not limited | |
| 19 | Dumps-Pits association | Not rated | |
| 25 | Gunsight-Cipriano complex, 1-8% slopes | Somewhat limited | Subsidence Risk (0.00) |
| 30 | Mohall sandy loam | Somewhat limited | Shrink-swell (0.16) |
| 33 | Mohall-Denure association | Somewhat limited | Shrink-swell (0.16) |
| 34 | Momoli-Carrizo complex, 1-8% slopes | Not limited | |
| 37 | Pinamt-Momoli complex, 1-8% slopes | Not limited | |
| 39 | Quilotosa-Rock outcrop complex, 5-60% slopes | Very limited | Depth to hard bedrock (1.00), Slope (1.00), Depth to soft bedrock (0.50) |
| 44 | Tremant-Denure complex | Somewhat limited | Shrink-swell (0.50) |
| 46 | Vaiva-Rock outcrop complex, 2-15% slopes | Very limited | Depth to hard bedrock (1.00) |
| 47 | Vaiva-Rock outcrop complex, 15-50% slopes | Very limited | Slope (1.00), Depth to hard bedrock (1.00) |
| 48 | Valencia sandy loam | Very limited | Flooding (1.00) |
| 49 | Why sandy loam | Very limited | Flooding (1.00) |

* Rating threshold of 0.10 and greater, except for single reason ratings of less than 0.10, which are displayed.

4.4.3.2 Small Commercial Buildings

Small commercial buildings are structures that are less than three stories high and do not have basements. Examples include nature and interpretive centers. The foundation is assumed to consist

of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper.

The ratings in Table 4-8 are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification of the soil). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

| No. | Map unit | Rating | Rating reasons (numeric values)* |
|------------|--|------------------|--|
| 7 | Cherioni-Rock outcrop complex, 5-60% slopes | Very limited | Depth to hard bedrock (1.00), Slope (1.00) |
| 13 | Dateland fine sandy loam | Very limited | Flooding (1.00) |
| 15 | Denure very gravelly sandy loam, 1-8% slopes | Somewhat limited | Slope (0.14) |
| 16 | Denure sandy loam, 1-3% slopes | Not limited | |
| 17 | Denure fine sandy loam, 1-3% slopes | Not limited | |
| 19 | Dumps-Pits association | Not rated | |
| 25 | Gunsight-Cipriano complex, 1-8% slopes | Somewhat limited | Gunsight-Subsidence Risk (0.00), Slope (0.00) |
| | | | Cipriano-Slope (0.14) |
| 30 | Mohall sandy loam | Somewhat limited | Shrink-swell (0.16) |
| 33 | Mohall-Denure association | Somewhat limited | Shrink-swell (0.16) |
| 34 | Momoli-Carrizo complex, 1-8% slopes | Somewhat limited | Slope (0.14) |
| 37 | Pinamt-Momoli complex, 1-8% slopes | Somewhat limited | Slope (0.14) |
| 39 | Quilotosa-Rock outcrop complex, 5-60% slopes | Very limited | Depth to hard bedrock (1.00), Depth to soft bedrock (1.00), Slope (1.00) |
| 44 | Tremant-Denure complex | Somewhat limited | Shrink-swell (0.50) |
| 46 | Vaiva-Rock outcrop complex, 2-15% slopes | Very limited | Depth to hard bedrock (1.00), Slope (1.00) |
| 47 | Vaiva-Rock outcrop complex, 15-50% slopes | Very limited | Slope (1.00), Depth to hard bedrock (1.00) |
| 48 | Valencia sandy loam | Very limited | Flooding (1.00) |
| 49 | Why sandy loam | Very limited | Flooding (1.00) |

* Rating threshold of 0.10 and greater, except for single reason ratings of less than 0.10, which are displayed.

4.4.3.3 Local Roads (All Weather)

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder.

The ratings in Table 4-9 are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

| Table 4-9-Local Roads Suitabilities and Limitations Ratings | | | |
|--|--|------------------|---|
| No. | Map unit | Rating | Rating reasons (numeric values)* |
| 7 | Cherioni-Rock outcrop complex, 5-60% slopes | Very limited | Depth to hard bedrock (1.00), Low strength (1.00) |
| 13 | Dateland fine sandy loam | Somewhat limited | Flooding (0.40) |
| 15 | Denure very gravelly sandy loam, 1-8% slopes | Not limited | |
| 16 | Denure sandy loam, 1-3% slopes | Not limited | |
| 17 | Denure fine sandy loam, 1-3% slopes | Not limited | |
| 19 | Dumps-Pits association | Not rated | |
| 25 | Gunsight-Cipriano complex, 1-8% slopes | Not limited | |
| 30 | Mohall sandy loam | Somewhat limited | Shrink-swell (0.16) |
| 33 | Mohall-Denure association | Somewhat limited | Shrink-swell (0.16) |
| 34 | Momoli-Carrizo complex, 1-8% slopes | Not limited | |
| 37 | Pinamt-Momoli complex, 1-8% slopes | Not limited | |
| 39 | Quilotosa-Rock outcrop complex, 5-60% slopes | Very limited | Depth to hard bedrock (1.00), Depth to soft bedrock (1.00), Low strength (1.00), Slope (1.00) |
| 44 | Tremant-Denure complex | Somewhat limited | Shrink-swell (0.50) |
| 46 | Vaiva-Rock outcrop complex, 2-15% slopes | Very limited | Depth to hard bedrock (1.00) |
| 47 | Vaiva-Rock outcrop complex, 15-50% slopes | Very limited | Depth to hard bedrock (1.00), Slope (1.00) |
| 48 | Valencia sandy loam | Very limited | Flooding (1.00) |
| 49 | Why sandy loam | Very limited | Flooding (1.00) |

* Rating threshold of 0.10 and greater, except for single reason ratings of less than 0.10, which are displayed.

4.4.4 Sanitary Facilities

The soils of the survey area are rated in Table 4-10 according to limitations that affect their suitability for sanitary facilities. The limitations are considered Slight if soil properties and site features generally are favorable for the indicated use and limitations are minor and easily overcome; moderate if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and severe if

soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

4.4.4.1 Septic Tank Absorption Fields

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings in Table 4-10 are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Saturated hydraulic conductivity (Ksat), depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

| No. | Map unit | Rating | Rating reasons (numeric values)* |
|------------|--|------------------|---|
| 7 | Cherioni-Rock outcrop complex, 5-60% slopes | Very limited | Depth to bedrock (1.00), Depth to cemented pan (1.00), Slope (1.00) |
| 13 | Dateland fine sandy loam | Somewhat limited | Slow water movement (0.50), Flooding (0.40) |
| 15 | Denure very gravelly sandy loam, 1-8% slopes | Very limited | Slow water movement (1.00) |
| 16 | Denure sandy loam, 1-3% slopes | Very limited | Slow water movement (1.00) |
| 17 | Denure fine sandy loam, 1-3% slopes | Very limited | Slow water movement (1.00) |
| 19 | Dumps-Pits association | Not rated | |
| 25 | Gunsight-Cipriano complex, 1-8% slopes | Not limited | |
| 30 | Mohall sandy loam | Very limited | Slow water movement (1.00) |
| 33 | Mohall-Denure association | Very limited | Mohall-Slow water movement (1.00) |
| | | | Denure-Slow water movement (1.00) |
| 34 | Momoli-Carrizo complex, 1-8% slopes | Not limited | |
| 37 | Pinamt-Momoli complex, 1-8% slopes | Not limited | |
| 39 | Quilotosa-Rock outcrop complex, 5-60% slopes | Very limited | Depth to bedrock (1.00), Slope (1.00) |
| 44 | Tremant-Denure complex | Very limited | Tremant-Slow water movement (1.00) |
| | | | Denure-Slow water movement (1.00) |
| 46 | Vaiva-Rock outcrop complex, 2-15% slopes | Very limited | Depth to bedrock (1.00), Slope (0.04) |
| 47 | Vaiva-Rock outcrop complex, 15-50% slopes | Very limited | Depth to bedrock (1.00), Slope (1.00) |
| 48 | Valencia sandy loam | Very limited | Flooding (1.00), Slow water movement (1.00) |
| 49 | Why sandy loam | Very limited | Flooding (1.00) |

* Rating threshold of 0.10 and greater, except for single reason ratings of less than 0.10, which are displayed.

4.4.5 RMP Management Decisions

The RMP's two primary soil resources management actions apply to the CRMA, each with specific management sub-actions:

- SL-1: Ensure watersheds are functioning appropriately and are consistent with Land Health Standards. Characteristics of a properly functioning watershed include channels that are stable and in balance with the landscape; erosion and sediment deposition appropriate for the ecological site; infiltration of surface water in soils sufficient to support desired future conditions (DFCs) and minimize erosion from runoff; and flood frequencies, durations, and magnitudes appropriate for the landscape.
- SL-2: Maintain or improve sensitive soils to avoid accelerated erosion rates.

The management sub-actions are described in detail in the RMP Section 2.2.5 Soil Resources.

4.5 Vegetation

The CRMA's vegetation setting is classified as the Arizona Upland Subdivision of the Sonoran Desert. The terrain generally is home to numerous mountain ranges and broad valleys. The Arizona Upland Subdivision is also known as the saguaro-paloverde forest. It is the highest, wettest, and coldest Sonoran Desert subdivision and is the only one that experiences frequent winter temperatures below freezing. Due to this, many plant species of lower or southern Sonoran Desert subdivisions are not able to survive in this region. Many desert plant species are protected by the Arizona Native Plants Law (Title 3-Agriculture, Chapter 7-Arizona Native Plants, §3-901 to §3-934). Plant species on the lists below that are typical for the area that are also on the Protected Plant Lists are denoted with an asterisk (*). In addition to the denoted plants, there are likely many more species on the Protected Plant Lists that can be found in the CRMA, but are not prominent species to the specific plant community.

As described by Turner and Brown (1982), the majority of the mapped vegetation within the CRMA is within the Sonoran Paloverde-Mixed Cacti Desertscrub Series of the Arizona Upland Subdivision (Figure 4-3). Within the CRMA, this series is predominantly located in elevations ranging from 1,300 feet to the CRMA's high point of 2,650 feet. This series is composed of evergreen and deciduous leguminous trees, intermixed with a diverse mix of shrubs and cacti. The most prominent plants are:

- Foothill paloverde (*Parkinsonia microphylla*)*
- Triangle-leaf bursage (*Ambrosia deltoidea*)
- White bursage (*Ambrosia dumosa*)
- Saguaro (*Carnegiea gigantea*)*
- Fish-hook pincushion (*Mammillaria grahamii* var. *grahamii*)*

Other common species include:

- Creosotebush (*Larrea tridentata*)
- Desert ironwood (*Olneya tesota*)*
- Brittlebush (*Encelia farinosa*)
- Catclaw acacia (*Acacia greggii*)

- Velvet mesquite (*Prosopis velutina*)*
- Several cholla species (*Cylindropuntia spp.*)*-several

The majority of the remaining area is within the Sonoran-Mojave Creosotebush-White Bursage Desertscrub Series of the Arizona Upland Subdivision. Total vegetative cover in most creosotebush communities is usually less than 20%, with creosotebush comprising less than 8%. Within the study area, this series is predominantly located in elevations ranging from 1,300 feet to 1,950 feet. As the name implies, the most prominent plants are:

- Creosotebush (*Larrea tridentata*)
- White bursage (*Ambrosia dumosa*)
- In some southern areas of the Sonoran Desert, the drought-deciduous sub-shrub brittlebush (*Encelia farinosa*) replaces white bursage on some sites

Other common species include:

- Fourwing saltbush (*Atriplex canescens*)
- Desertholly (*Atriplex hymenelytra*)*
- Rough jointfir (*Ephedra nevadensis*)
- Ocotillo (*Fouquieria splendens*)*
- Water jacket (*Lycium andersonia*)
- Pricklypear (*Opuntia engelmannii*, *phaeacantha*, and others)

Additionally, a few small inclusions of the North American Warm Desert Riparian Mesquite Bosque, North American Warm Desert Riparian Woodland and Shrubland, and Sonoran-Mojave Mixed Salt Desertscrub series also occur in scattered locations within the CRMA.

4.5.1 RMP Management Decisions

The RMP's five primary vegetation resources management actions apply to the CRMA, each with specific management sub-actions:

- VM-1: The natural diversity and abundance of native vegetation will occur as expected for landform and ecological site.
- VM-2: Populations of endangered, threatened, and special status plants will be stable and/or increasing and suitable habitat is available for future establishment and maintenance of the populations.
- VM-3: Noxious and undesirable plant species will not occur on the landscape or, if they occur, they will make up a sufficiently small percentage of the vegetative community that they do not affect ecological processes.
- VM-4: Protect native plants from over-collecting and other uses.
- VM-5: Native plants will occur at a natural abundance and distribution.

The management sub-actions are described in detail in the RMP Section 2.2.6 Vegetation Resources.

The RMP's three primary wildland fire management actions apply to the CRMA, each with specific management sub-actions:

- WF-1: Ensure firefighter and public safety is the highest priority in every fire or fuels management activity.
- WF-2: Wildland fuels are managed to protect Wildland Urban Interface (WUI) areas and meet resource management objectives.
- WF-3: Limit the extent of wildfires and the impact of fire suppression efforts on wildlife, plant communities, and natural and cultural features.

The management sub-actions are described in detail in the RMP Section 2.2.11 Wildland Fire Management.

4.6 Visual Resource Management

The public lands administered by the BLM contain many outstanding scenic landscapes. While these lands provide a place to escape and enjoy the beauty of nature, they are also used for a multitude of other activities. Any activities that occur on these lands, such as recreation, mining, timber harvesting, grazing, or road development, have the potential to disturb the surface of the landscape and impact scenic values. Visual resource management (VRM) is a system for minimizing the visual impacts of surface-disturbing activities and maintaining scenic values for the future. When visual resources are not carefully managed and the visual impacts of poorly designed surface-disturbing activities are ignored, there can be dire consequences to the scenic values of American landscapes. The benefits to be gained by carefully designing surface-disturbing activities to minimize visual impacts are readily apparent. The BLM is committed to sound management of the scenic values on public lands in order to ensure that these benefits are realized and the scenic values are protected (“Visual Resource Management,” n.d.).

Visual resources are managed to meet the objectives for VRM Classes I through IV, as defined in the BLM’s *Handbook H-8410-1 - Visual Resource Inventory*, Section V-Visual Resource Classes and Objectives B.1 through B.4. As a part of the development of the RMP, VRM classes were identified across the Lower Sonoran Planning Area, excluding non-federally owned land (Figure 4-4). Objectives (desired conditions) for the VRM classes are described below.

4.6.1 VRM Class I

The objective of this class provides for natural ecological changes, but it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention. However, this class does not occur within the CRMA. A nearby example of a Class I setting is the southern portion of the Sierra Estrella Mountains that is managed by BLM.

4.6.2 VRM Class II

The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities on BLM land may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. Within the CRMA, the Palo Verde Mountains are characterized as Class II.

4.6.3 VRM Class III

The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities on BLM land may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. Within the CRMA, Haley Hills, the unnamed two-mile long mountain range, the north extension of the Table Top Mountains, and the alluvial plain surrounding the Palo Verde Mountains are characterized as Class III.

4.6.4 VRM Class IV

The objective of this class is to provide for management activities on BLM land that require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer's attention. Every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements. Within the CRMA, the Hidden Valley and Vekol Wash plains and the alluvial plains surrounding the Table Top Mountains extension are characterized as Class IV.

4.6.5 RMP Management Decisions

The RMP's two primary visual resources management actions apply to the CRMA, each with specific management sub-actions:

- VR-1: Manage public lands that would maintain scenic quality, natural landscapes, undisturbed views, and other high-quality visual resources.
- VR-2: Maintain night sky condition.

The management sub-actions are described in detail in the RMP Section 2.2.7 Visual Resources.

4.7 Hydrology

Vekol Wash bisects the CRMA and flows from west to east within the CRMA, but generally from south to north along its entire course. Vekol Wash is a tributary to the Santa Cruz River and joins it approximately seven miles north of SR 238. The CRMA is within the Santa Cruz River Watershed. The Santa Cruz River has its headwaters in the San Rafael Valley, which is in south central Arizona. The river flows south and makes a 25-mile loop through Mexico before returning to U.S. soil about five miles east of Nogales. The river then flows north from the U.S.-Mexico border up to its confluence with the Gila River, approximately six miles downstream and northwest of the Vekol Wash confluence.

Current Federal Emergency Management Agency (FEMA) flood zone information is shown on Figure 4-5 and is based on FEMA Flood Insurance Rate Map (FIRM) panels. A FIRM is the official map on which FEMA has delineated both the special hazard areas and the risk premium zones applicable to the community. Flood zones include:

Zones within the CRMA

Zone A: A high risk area where no Base Flood Elevations have been determined. Vekol Wash comprises Zone A as it crosses the CRMA south of Haley Hills.

Zone X: Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods. All of the CRMA lies within this zone, except for Zone A along Vekol Wash.

Zones in the CRMA Vicinity

Zone AE: A high risk area where Base Flood Elevations have been determined.

Zone AH: Areas of shallow flooding, usually in the form of ponding, with an average depth ranging from one to three feet. These areas are considered high risk areas.

Zone AO: River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from one to three feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.

Zone D: An undetermined risk area with possible but undetermined flood hazards.

4.7.1 RMP Management Decisions

The RMP's two primary water resources management actions apply to the CRMA, each with specific management sub-actions:

- WR-1: Ensure physical and legal availability of water in sufficient quantity and quality to meet the management needs of the LSDA.
- WR-2: All surface water in the LSDA will meet appropriate state water quality standards or will have state-approved plans for water quality improvement.

The management sub-actions are described in detail in the RMP Section 2.2.8 Water Resources.

4.8 Biology

4.8.1 Sensitive Species

Sensitive species that may be present or have suitable habitat within the CRMA and a 3-mile buffer were reported by the Arizona Game and Fish Department (AGFD) through the Heritage Data Management System (HDMS). The table was generated by providing the township, range, and sections of the study area to HDMS staff. Results of the database query, the conservation status of each species, and notes on each species' habitat use and potential presence in the study area are presented in Table 4-11.

No species listed as threatened or endangered under the Endangered Species Act are likely to be present in the study area. The Sonoran Desert Tortoise and the Western Burrowing Owl are likely to be present, and will necessitate compliance with AGFD guidelines if either of these animals are encountered during construction development activities.

Table 4-11. Sensitive Species Reported from the Heritage Data Management System.

| 1A, 1B, 1C: SGCN Tier BGEPA: Bald and Golden Eagle Protection Act BLMS: Bureau of Land Management Sensitive Species E: ESA Endangered Species | | | NEP: Nonessential Experimental Population SERI: Species of Economic and Recreational Importance SGCN: Species of Greatest Conservation Need T: ESA Threatened Species |
|--|-----------------|---|--|
| Common name <i>Scientific name</i> | Status | Habitat and Notes | |
| Mammals | | | |
| Harris' Antelope Squirrel <i>Ammospermophilus harrisi</i> | SGCN (1B) | Sonoran Desertscrub, particularly in rocky areas. Suitable habitat throughout Study Area. | |
| Sonoran Pronghorn <i>Antilocapra americana sonoriensis</i> | E (NEP) | Study Area is within the designated NEP boundary, but Sonoran Pronghorns are not present. | |
| American Beaver <i>Castor canadensis</i> | SGCN (1B) | Suitable habitat is not present within the Study Area boundary. | |
| Pale Townsend's Big-eared Bat <i>Corynorhinus townsendii pallescens</i> | BLMS; SGCN (1B) | Roosts in caves, mines, and old buildings. Forages widely. Suitable habitat is present in the Study Area. | |
| Banner-tailed Kangaroo Rat <i>Dipodomys spectabilis</i> | BLMS; SGCN (1B) | Valley bottoms with deep, soft soils in Sonoran Desertscrub. Suitable habitat throughout Study Area. | |
| Spotted Bat <i>Euderma maculatum</i> | BLMS; SGCN (1B) | Roosts in crevices in cliffs. Forages widely. Unlikely to be present in the Study Area. | |
| Western Bonneted Bat <i>Eumops perotis</i> | BLMS; SGCN (1B) | Roosts in crevices in cliffs. Forages widely, higher than most bats. Suitable habitat is present in the Study Area. | |
| Western Red Bat <i>Lasiurus blossevillii</i> | BLMS; SGCN (1B) | Roosts in trees, including orchards. Forages near roosts. Suitable habitat is present in the Study Area. | |
| Western Yellow Bat <i>Lasiurus xanthinus</i> | BLMS; SGCN (1B) | Roosts in palms and other trees. Foraging habitat uncertain. Suitable habitat is present in the Study Area. | |
| Lesser Long-nosed Bat <i>Leptonycteris curasoae yerbabuena</i> | E; SGCN (1A) | Roosts in colonies in mines and caves. Feeds on Saguaro nectar. Suitable habitat is present in the Study Area. | |
| Antelope Jackrabbit <i>Lepus alleni</i> | SGCN (1B) | Valley bottoms in Sonoran Desertscrub. Suitable habitat is present in the Study Area. | |
| California Leaf-nosed Bat <i>Macrotus californicus</i> | BLMS; SGCN (1B) | Roosts in caves and mines. Forages in Sonoran Desertscrub. Suitable habitat is present in the Study Area. | |
| Cave Myotis <i>Myotis velifer</i> | BLMS; SGCN (1B) | Roosts in caves and mines. Forages near water in arid areas. Suitable habitat is present in the Study Area. | |
| Yuma Myotis <i>Myotis yumanensis</i> | SGCN (1B) | Roosts in crevices. Forages near water in arid areas. Suitable habitat is present in the Study Area. | |
| Pocketed Free-tailed Bat <i>Nyctinomops femorosaccus</i> | SGCN (1B) | Roosts in caves and crevices. Forages near water in arid areas. Suitable habitat is present in the Study Area. | |
| Mule Deer <i>Odocoileus hemionus</i> | SERI | Widespread in Sonoran Desertscrub. Suitable habitat is present in the Study Area. | |
| Mexican Desert Bighorn Sheep <i>Ovis canadensis mexicana</i> | SERI | Rocky desert mountains in Sonoran Desertscrub. Suitable habitat is present in the Study Area. | |
| Collared Peccary <i>Pecari tajacu</i> | SERI | Widespread in Sonoran Desertscrub. Suitable habitat is present in the Study Area. | |
| Arizona Pocket Mouse <i>Perognathus amplus</i> | SGCN (1B) | Valley bottoms with deep, soft soils in Sonoran Desertscrub. Suitable habitat throughout Study Area. | |
| Little Pocket Mouse <i>Perognathus longimembris</i> | SGCN (1B) | Valley bottoms with deep, soft soils in Sonoran Desertscrub. Suitable habitat throughout Study Area. | |
| Mountain Lion <i>Puma concolor</i> | SERI | Rocky desert mountains in Sonoran Desertscrub. Suitable habitat is present in the Study Area. | |

Table 4-11. Sensitive Species Reported from the Heritage Data Management System.

| 1A, 1B, 1C: SGCN Tier BGEPA: Bald and Golden Eagle Protection Act BLMS: Bureau of Land Management Sensitive Species E: ESA Endangered Species NEP: Nonessential Experimental Population SERI: Species of Economic and Recreational Importance SGCN: Species of Greatest Conservation Need T: ESA Threatened Species | | |
|--|------------------------|--|
| Common name <i>Scientific name</i> | Status | Habitat and Notes |
| Brazilian Free-tailed Bat <i>Tadarida brasiliensis</i> | SGCN (1B) | Roosts in caves, crevices, and buildings. Suitable habitat is present in the Study Area. |
| Kit Fox <i>Vulpes macrotis</i> | SGCN (1B) | Valley bottoms with deep, soft soils in Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Sonoran Pronghorn <i>Antilocapra americana sonoriensis</i> | E (NEP) | Study Area is within the designated NEP boundary, but Sonoran Pronghorns are not present. |
| Birds | | |
| Wood Duck <i>Aix sponsa</i> | SGCN (1B) | Winters in Arizona, typically in larger lakes and rivers. Suitable habitat is not present within the Study Area. |
| Sprague's Pipit <i>Anthus spragueii</i> | SGCN (1A) | Winters in Arizona in sparse grasslands and farm fields. Suitable habitat is not present within the Study Area. |
| Golden Eagle <i>Aquila chrysaetos</i> | BGEPA; BLMS; SGCN (1B) | Nests in remote, rugged mountains. Forages widely. Suitable habitat is present in the Study Area. |
| Burrowing Owl <i>Athene cucularia</i> | BLMS; SGCN (1B) | Soft soils in open areas in Sonoran Desertscrub and farmlands. Suitable habitat is present in the Study Area. |
| American Bittern <i>Botaurus lentiginosus</i> | SGCN (1B) | Prefers marshy areas with dense emergent vegetation. Suitable habitat is not present within the Study Area. |
| Ferruginous Hawk <i>Buteo regalis</i> | BLMS; SGCN (1B) | Winters in Sonoran Desertscrub in open areas. Suitable habitat is present in the Study Area. |
| Gambel's Quail <i>Callipepla gambelii</i> | SERI | Sonoran Desertscrub, particularly near dense vegetation. Suitable habitat is present in the Study Area. |
| Western Yellow-billed Cuckoo <i>Coccyzus americanus</i> | T; SGCN (1A) | Nests in large patches of riparian woodland. Suitable habitat is not present within the Study Area. |
| Gilded Flicker <i>Colaptes chrysoides</i> | BLMS; SGCN (1B) | Nests in cavities in Saguaros and large trees. Suitable habitat is present in the Study Area. |
| Cactus Ferruginous Pygmy-owl <i>Glaucidium brasilianum cactorum</i> | BLMS; SGCN (1B) | Nests in cavities in Saguaros and large trees. Suitable habitat is present in the Study Area. |
| Bald Eagle <i>Haliaeetus leucocephalus</i> | BGEPA; BLMS; SGCN (1A) | Nests and forages near large bodies of water. Suitable habitat is not present within the Study Area. |
| Gila Woodpecker <i>Melanerpes uropygialis</i> | SGCN (1B) | Nests in cavities in Saguaros and large trees. Suitable habitat is present in the Study Area. |
| Lincoln's Sparrow <i>Melospiza lincolnii</i> | SGCN (1B) | Winters in dense, brushy vegetation near water. Suitable habitat is not present within the Study Area. |
| Abert's Towhee <i>Melospiza aberti</i> | BLMS; SGCN (1B) | Prefers dense vegetation in wooded or riparian areas. Suitable habitat is not present within the Study Area. |
| Savannah Sparrow <i>Passerculus sandwichensis</i> | SGCN (1B) | Grassy areas in Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Rufous-winged Sparrow <i>Peucaea carpalis</i> | SGCN (1B) | Grassy areas in Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Desert Purple Martin <i>Progne subis hesperia</i> | BLMS; SGCN (1B) | Nests in cavities in Saguaros and large trees. Suitable habitat is present in the Study Area. |
| Yuma Clapper Rail <i>Rallus longirostris yumanensis</i> | E; SGCN (1A) | Shallow wetlands with dense emergent vegetation. Suitable habitat is not present within the Study Area. |

Table 4-11. Sensitive Species Reported from the Heritage Data Management System.

| 1A, 1B, 1C: SGCN Tier BGEPA: Bald and Golden Eagle Protection Act BLMS: Bureau of Land Management Sensitive Species E: ESA Endangered Species NEP: Nonessential Experimental Population SERI: Species of Economic and Recreational Importance SGCN: Species of Greatest Conservation Need T: ESA Threatened Species | | |
|--|-------------------------|---|
| Common name <i>Scientific name</i> | Status | Habitat and Notes |
| Yellow Warbler <i>Setophaga petechia</i> | SGCN (1B) | Washes and riparian areas. Suitable habitat is not present in the Study Area. |
| Le Conte's Thrasher <i>Toxostoma lecontei</i> | SGCN (1B) | Open, low-elevation Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Pacific Wren <i>Troglodytes pacifica</i> | SGCN (1B) | Infrequent in winter in Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Arizona Bell's Vireo <i>Vireo bellii arizonae</i> | SGCN (1B) | Dense, brushy vegetation along washes. Suitable habitat is present in the Study Area. |
| White-winged Dove <i>Zenaida asiatica</i> | SERI | Widespread in Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Reptiles | | |
| Redback Whiptail <i>Aspidoscelis xanthonota</i> | SGCN (1B) | Canyons and washes in Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Variable Sandsnake <i>Chilomeniscus stramineus</i> | SGCN (1B) | Loose, sandy soils in valley bottoms in Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Sonoran Whipsnake <i>Coluber bilineatus</i> | SGCN (1B) | Sonoran Desertscrub, especially near washes. Suitable habitat is present in the Study Area. |
| Tiger Rattlesnake <i>Crotalus tigris</i> | SGCN (1B) | Prefers rocky slopes and desert mountains in Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Sonoran Collared Lizard <i>Crotaphytus nebrius</i> | SGCN (1B) | Prefers rocky slopes and desert mountains in Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Sonoran Desert Tortoise <i>Gopherus morafkai</i> | BLMS; CCA; SGCN (1A) | Prefers rocky slopes and desert mountains in Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Gila Monster <i>Heloderma suspectum</i> | SGCN (1A) | Prefers rocky slopes and desert mountains in Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Rosy Boa <i>Lichanura trivirgata</i> | SGCN (1B) | Prefers rocky slopes and desert mountains in Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Sonoran Coralsnake <i>Micruroides euryxanthus</i> | SGCN (1B) | Widespread in Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Goode's Horned Lizard <i>Phrynosoma goodei</i> | SGCN (1B) | Low-elevation, open Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Regal Horned Lizard <i>Phrynosoma solare</i> | SGCN (1B) | Low-elevation, open Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Saddled Leaf-nosed Snake <i>Phyllorhynchus browni</i> | SGCN (1B) | Valley bottoms and gentle slopes in Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Amphibians | | |
| Sonoran Green Toad <i>Anaxyrus retiformis</i> | BLMS; SGCN (1B) | Breeds in temporary pools after summer rains in Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Western Narrow-mouthed Toad <i>Gastrophryne olivacea</i> | BLMS; SGCN (1C) | Breeds in temporary pools after summer rains in Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Sonoran Desert Toad <i>Incilius alvarius</i> | SGCN (1B) | Breeds in temporary pools after summer rains in Sonoran Desertscrub. Suitable habitat is present in the Study Area. |
| Lowland Burrowing Treefrog <i>Smilisca fodiens</i> | BLMS; SGCN (1B) | Breeds in temporary pools after summer rains in Sonoran Desertscrub. Suitable habitat is present in the Study Area. |

Table 4-11. Sensitive Species Reported from the Heritage Data Management System.

| | | | |
|--|---------------|--------------------------|--|
| 1A, 1B, 1C: SGCN Tier BGEPA: Bald and Golden Eagle Protection Act BLMS: Bureau of Land Management Sensitive Species E: ESA Endangered Species | | | NEP: Nonessential Experimental Population SERI: Species of Economic and Recreational Importance SGCN: Species of Greatest Conservation Need T: ESA Threatened Species |
| Common name <i>Scientific name</i> | Status | Habitat and Notes | |
| Other Sensitive Biological Features | | | |
| Gila Bend - Sierra Estrella Linkage Design | | | |
| Pinal and Maricopa County Wildlife Connectivity Assessments | | | |

4.8.2 Desert Tortoise Habitat

The Sonoran Desert Tortoise (*Gopherus morafkai*) is a BLM sensitive species as well as an AGFD Wildlife Species of Concern. Sonoran Desert Tortoises were considered for listing under the ESA, but listing was not found to be necessary, in part due to the development of conservation plans including a cooperative Candidate Conservation Agreement (CCA). The BLM is a party to the CCA. Specific habitat categories for the Sonoran Desert Tortoise have been established by the BLM for management purposes. The habitat category of highest management priority is Category I. Management objectives for Category I are the maintenance of stable, viable populations and the protection of existing habitat values. Additionally, where possible, populations are to be managed to increase in numbers. Category II habitat is to be managed to maintain stable, viable populations, and limit any further declines in habitat quality. Finally, Category III habitat management objectives include limiting the decline of habitat and populations through mitigation of impacts (WildEarth Guardians and Western Watersheds Project 2008). Much of the southern portion of the Study Area is mapped as Category II Sonoran Desert Tortoise habitat (Biological Resources Map B). Habitat Categories I and III do not occur within the study area.

4.8.3 Wildlife Linkages

The Arizona Wildlife Linkages Workgroup, a partnership of land management agencies, Northern Arizona University, and other stakeholders, conducted a statewide assessment to identify areas for further detailed evaluation (Arizona Wildlife Linkages Working Group 2006). After the initial effort to identify potential corridors, some were selected as priorities for detailed modeling. Linkage modeling attempts to predict where the cost (in energy or survival) to an animal moving across the landscape would be lowest, so that those areas can be prioritized to minimize or mitigate barriers to movement. Modeling for the Gila Bend – Sierra Estrella Linkage was completed in 2008, with the following selected as “focal species” used to model corridor suitability (Beier et al. 2008): Bobcat, Bighorn Sheep, Collared Peccary, Mountain Lion, Mule Deer, Desert Tortoise, and Gila Monster. Pinal County and Maricopa County each began separate assessments of wildlife linkages, using methods similar to each other. These assessments used stakeholder input to identify several categories of areas that would support or impede wildlife movement across the landscape (AGFD 2012, AGFD 2013): Diffuse Movement Areas, Landscape Movement Areas, Riparian Movement

Areas, and Barriers. Results of these county-level assessments in the study area are shown on Biological Resources Map A (Figure 4-6).

Several strands of the linkage were identified to connect the Sonoran Desert National Monument and Sierra Estrella Mountains, including a strand that crosses through the Study Area and are shown on Biological Resources Map B (Figure 4-7).

4.8.4 RMP Management Decisions

The RMP's fourteen primary wildlife and special status species resources management actions apply to the CRMA, each with specific management sub-actions:

- WL-1 (Wildlife Habitat Area Management): Manage to encourage habitat availability and diversity for wildlife resources so habitats are maintained and/or improving within WHAs, where priority species will receive focus when analyzing activities and projects.
- WL-2 (Lesser Long-nosed Bat): Maintain, protect, and make accessible to Lesser Long-nosed Bats roosts and contiguous foraging habitat.
- WL-3 (Sonoran Pronghorn): Protect and enhance Sonoran Pronghorn habitat and manage to support suitable habitat so it is available for future occupancy based on recovery goals.
- WL-4 (Southwestern Willow Flycatcher and Yellow-billed Cuckoo): Manage habitats for the Southwestern Willow Flycatcher and Yellow-billed Cuckoo so they are maintained and/or improving.
- WL-5 (Yuma Clapper Rail): Manage habitat for the Yuma Clapper Rail so it is maintained and/or improving.
- WL-6 (Sonoran Desert Tortoise): Manage tortoise habitat so habitats provide sufficient forage and shelter for a viable population.
- WL-7 (Cactus Ferruginous Pygmy-owl):
- WL-8 (General Bats): Manage to encourage the natural abundance and diversity of bat habitats so they are stable or increasing.
- WL-9 (Migratory Birds): Manage migratory bird habitats so they are maintained and/or improving to meet the needs of migratory birds in general.
- WL-10 (Raptor Habitats): Manage raptor habitats so they are maintained and/or improving to meet the needs of raptors in general.
- WL-11 (Bighorn Sheep/Big Game): Manage Bighorn Sheep and other big game habitats so they are maintained and/or improving.
- WL-12 (Wildlife Movement Corridors): Manage wildlife movement corridors so they contain ample habitat to assist wildlife in moving from one area to another in a relatively safe manner.
- WL-13 (Priority Species Management Guidance): Manage wildlife habitats so they are maintained and/or improved.
- WL-14 (Wildlife Waters): Provide wildlife with safe, usable, year-round access to water.
- WL-15 (Nonnative Invasive Animal Species Guidance): Manage to reduce or eliminate undesirable nonnative animal species so they do not occur in the Decision Areas or so their presence does not adversely affect ecological processes.
- VM-1: The natural diversity and abundance of native vegetation will occur as expected for landform and ecological site.

- VM-2: Populations of endangered, threatened, and special status plants will be stable and/or increasing and suitable habitat is available for future establishment and maintenance of the populations.
- VM-3: Noxious and undesirable plant species will not occur on the landscape or, if they occur, they will make up a sufficiently small percentage of the vegetative community that they do not affect ecological processes.
- VM-4: Protect native plants from over-collecting and other uses.
- VM-5: Native plants will occur at a natural abundance and distribution.

The management sub-actions are described in detail in the RMP Section 2.2.12 Wildlife and Special Status Species.

4.9 Surrounding Land Uses/Ownership

Existing land uses in the study area, by its remoteness and majority BLM ownership, is mostly unoccupied and undeveloped land (Figure 4-8). According to the *We Create Our Future, Pinal County Comprehensive Plan, 2013* the predominant existing land use within the CRMA is Existing/Planned or Proposed Regional Park. Existing land uses surrounding the CRMA within the ¼-mile buffer area include:

- Pinal County
 - Very Low Density Residential (0-1 dwelling unit per acre [du/ac]), predominantly, except the following:
 - Native American Community, north of the CRMA
 - Major Open Space (or 1 du/ac), Arizona State Trust (AST) land section north of Farrell Road alignment
 - Moderate Low Density Residential (1-3.5 du/ac), along Peters & Nall Road
 - Recreation/Conservation (Sonoran Desert National Monument), south of I-8
 - Mid-Intensity Activity Center, centered at Hidden Valley Road and Farrell Road and extends west to within the ¼-mile buffer
 - Secondary Airport, Sage Street and Dasher Drive
- Maricopa County
 - Rural Development Area, north of I-8
 - Dedicated Open Space (Sonoran Desert National Monument), south of I-8

Additionally, there are numerous entitled or planned residential subdivisions across the area between the CRMA and the City of Maricopa in unincorporated Pinal County.

The study area encompasses approximately 21,931 acres, which is more than 34 square miles and includes the SR 238, I-8, and Union Pacific Railroad rights-of-way. The northern contiguous area (not including private in-holding exceptions totaling approximately 80 acres) encompasses approximately 6,366 acres and the southern contiguous area encompasses approximately 15,565 acres. Other than the rights-of-way and private parcels along SR 238, the property within the CRMA is owned entirely by the BLM (Figure 4-9). Other than private ownership, the most notable adjacent ownership includes:

- AST—seven land sections, or portions thereof
- Gila River Indian Community—adjacent to the north
- BLM—adjacent to the west and south
- Arizona Department of Transportation (ADOT)—rights-of-way for SR 238 and I-8
- Union Pacific Railroad—rights-of-way paralleling SR 238

4.9.1 City of Maricopa General Plan

As is typical for municipalities with no bordering incorporated neighbor, the City of Maricopa’s municipal planning area extends well beyond the present City limits. Coordination with Pinal County, state, and federal governments and private landowners is a fundamental premise of the compatible, thoughtful development desired to provide for orderly growth and adequate provision of essential infrastructure and services. As such, the City of Maricopa municipal planning area encompasses most of the CRMA, extending to the Pinal County line.

Per the City of Maricopa *General Plan 2025*, adopted in 2006, the Parks and Open Space element identifies most of the study area as a future regional park and a significant component of its open space system. The inaugural General Plan also identifies an extensive trail system in the study area with trail corridors along the length of the mountain ridges from north to south, SR 238, SR 84, Vekol Wash, and several section line roads.

Concurrent with this study, the City of Maricopa is in the process of preparing *Planning Maricopa; Shaping Our Community (Draft)*, the first update to its General Plan. Continuing from the 2006 General Plan, the regional park is again discussed, which states that Palo Verde Regional Park “will provide a valuable open space and park resource for Maricopa and the greater planning area, once complete.” Additionally, the general plan states, “considerable attention to the planning process and thoughtful input is critical to creating a usable park and a regional attraction.”

The Future Land Use element identifies the CRMA predominantly as Park/Open Space, with part of the CRMA area that is north of SR 238 as Rural. Abutting future land uses within the ¼-mile buffer include:

- Rural (1 or less du/ac)
- Low Density Residential (2 or less du/ac)
- Mixed Use (6-18 du/ac)
- Resort
 - Private land north of Peters & Nall Road (with the CRMA abutting on the west, north, and east sides)
 - AST land between Meadow Green and Century Roads (with the CRMA abutting on the west and south sides, and partially on the north side)

4.9.2 City of Goodyear General Plan

The City of Goodyear updated and ratified its *General Plan 2025* in November 2014. The Goodyear Municipal Planning Area encompasses the Mobile community, which it annexed in 2007. Its Municipal Planning Area extends as far south as Papago Road, which is six miles south of SR 238. The Land Use and Transportation Plan identifies the area as neighborhood types and open space.

There is no reference in *General Plan 2025* to the adjacent area in Pinal County as a regional park. Abutting future land uses to the CRMA within the ¼-mile buffer include:

- Open Space
- Neighborhood (wide ranging du/ac, described as “complete neighborhoods”)
- Scenic Neighborhood (typically <1 du/ac, but may include clustered residential)

4.9.3 RMP Management Decisions

The RMP’s two primary lands and realty management actions are related to surrounding land uses and apply to the CRMA, each with specific management sub-actions:

- LR-1: Manage lands and realty actions to effectively support public needs and resource management objectives.
- LR-2: Manage land tenure to meet natural resource management objectives and community needs and to promote agency efficiency.

The management sub-actions are described in detail in the RMP Section 2.2.13 Lands and Realty.

4.10 Existing Grazing Leases/BLM Land Use Activities

The BLM, which administers about 245 million acres of public lands, manages livestock grazing on 157 million acres of those lands, as guided by federal law. The terms and conditions for grazing on BLM-managed lands (such as stipulations on forage use and season of use) are set forth in the permits and leases issued by the Bureau to public land ranchers.

In managing livestock grazing on public rangelands, the BLM’s overall objective is to ensure the long-term health and productivity of these lands and to create multiple environmental benefits that result from healthy watersheds. The BLM administers public land ranching in accordance with the Taylor Grazing Act of 1934, and in so doing provides livestock-based economic opportunities in rural communities while contributing to the West’s, and America’s, social fabric and identity. Together, public lands and private ranches maintain open spaces in the fast-growing West, provide habitat for wildlife, offer a myriad of recreational opportunities for public land users, and help preserve the character of the rural West.

Among the key issues that face public land managers today are global climate change, severe wildfires, invasive plant species, and dramatic human population increases, including the associated rural residential development that is occurring throughout the West. Grazing, which was one of the earliest uses of public lands when the West was settled, continues to be an important use of those same lands today in many areas. Livestock grazing now competes with more uses than it did in the past, as other industries and the general public look to the public lands as sources of both conventional and renewable energy and as places for outdoor recreational opportunities, including OHV use.

Livestock grazing can result in impacts on public land resources, but well-managed grazing provides numerous environmental benefits as well. For example, while livestock grazing can lead to increases in some invasive species, well-managed grazing can be used to manage vegetation. Intensively managed “targeted” grazing can control some invasive plant species or reduce the fuels that

contribute to severe wildfires. Besides providing such traditional products as meat and fiber, well-managed rangelands and other private ranch lands support healthy watersheds, carbon sequestration, recreational opportunities, and wildlife habitat. Livestock grazing on public lands helps maintain the private ranches that, in turn, preserve the open spaces that have helped write the West’s history and will continue to shape this region’s character in the years to come (“Fact Sheet on the BLM’s Management of Livestock Grazing,” n.d.). The status of grazing allotments that occur on and beyond the CRMA (Figure 4-10) are in Table 4-12 below.

| Allotment | Status | Expiration | Livestock/Quan. | Operator |
|----------------------|--|-------------------|------------------------|--|
| Conley | Active | 2/28/2025 | Cattle/350 | Keith Cattle LLC |
| Kirian | Active | 2/28/2015 | Cattle/35 | Brett McNeil |
| Lower Vekol | Active | 2/28/2015 | Cattle/101 | Brett McNeil |
| Table Top | Active | 2/28/2018 | Cattle/150 | Table Top-Vekol Ranches, LC |
| Table Top | Active | 2/28/2008 | Cattle/36 Horse/4 | Joe Guzman, TTE, Beneficial Group & Trust |
| Palo Verde Mountains | Ephemeral (based on and moisture and climate) | 2/28/2020 | Cattle/--- | Robert Sanders |
| Vekol | Closed | | | |

For more information, see the “Allotment Master Report” in the appendix.

4.10.1 RMP Management Decisions

The RMP’s one primary livestock grazing management action applies to the CRMA, with specific management sub-actions:

- GR-1: Manage livestock grazing in the Lower Sonoran Decision Area to provide for multiple uses while maintaining healthy ecosystems.

The management sub-actions are described in detail in the RMP Section 2.2.14 Livestock Grazing.

4.11 Active Mining Claims and Historical Mine Locations

Mining activities in the CRMA appear to have been minimal. As of November 2015, according to the BLM’s Land & Mineral Legacy Rehost 2000 System (LR 2000), there have been approximately 600 recorded mining claims within the CRMA, all of which are closed claims. Mining claims are limited in size to 20 acres per claim. The identified claimants include individuals, groups of individuals, prospecting clubs, and corporations. Location dates (if recorded) for the claims range from 1984 to 2003. Maintaining an active claim on BLM land requires an annual maintenance fee of \$140 (or a waiver certificate for a claimant with 10 or fewer active claims) and annual assessment work, which includes a minimum of \$100 in labor or improvements. Assessment work is not required for mill or tunnel sites; however, a claimant must file a notice of intent to hold the site.

Mining activities have included both placer mining and lode mining. Placer mining involves deposits of unconsolidated materials, such as sand and gravel, containing free gold or other minerals. Placer mining is often done individually by one prospector working alone on surface deposits. Lode mining involves classic underground veins or lodes having well-defined boundaries. They also include other valuable mineral bearing rock in-place and may be broad zones of mineralized rock. Lode mining typically requires multiple miners working together to extract the gold from tunnels in a mountain or deep underground. As there are no open mining claims within the CRMA, there is not a map figure included for reference.

Historically recorded commercial mining in the study area, according to the Mineral Resources Data System, managed by the U.S. Geological Survey, has included just two operations in the vicinity, both approximately ½ mile north of the CRMA (1-½ mile north of Highway 238). See “Historical Recorded Mining near Palo Verde CRMA” in the appendix. Primary commodities have included mica, feldspar, quartz, and silica. During a records search, there was no record found of precious metals having ever been mined.

A patented claim is one for which the federal government has passed title to the claimant, making it private land. A person may mine and remove minerals from a mining claim without a patent. A mineral patent gives the owner title to the minerals, surface, and other resources. During a records search, there were no examples found of patented claims within the CRMA. Patented claims for lodes are often discernible by their parcel configuration, with property lines outlining and paralleling the bearing and length of the underground lode. However, as of October 1, 1994, the Interior and Related Agencies Appropriation Act established a moratorium on the acceptance of new mineral patent applications. Until the moratorium expires (it has been extended by subsequent appropriation acts), patent applications are returned to the applicant without action (“Mining Claim Information,” n.d.).

4.11.1 Surface Management

The BLM regulates surface management of mining activity conducted on lands administered by the BLM. All mining activities require reasonable reclamation. The lowest level of mining activity, “casual use,” is designed for the miner or weekend prospector who creates only negligible surface disturbance (for example, activities that do not involve the use of earth-moving equipment or explosives may be considered casual use). Dredging at any level of use may require a permit from the appropriate state agency administering water quality. The second level of activity is where surface disturbance is 5 acres or less per year and requires a notice advising the BLM of the anticipated work 15 days prior to commencement. This notice needs to be filed with the appropriate field office. No approval is needed although bonding is required. State agencies need to be notified to ensure that their requirements are met. The next level of activity involves more than 5 acres and requires a detailed plan of operation that must be filed with the appropriate BLM field office. Bonding is required to ensure proper reclamation (“Mining Claim Information,” n.d.).

According to LR 2000, as of November 2015, there are no Notices of Intent or Plans of Operation that are either pending or authorized in the CRMA and study area.

4.11.2 RMP Management Decisions

The RMP's one primary minerals management action applies to the CRMA, with specific management sub-actions:

- MM-1: Provide opportunities for exploration and development of energy and mineral resources.

The management sub-actions are described in detail in the RMP Section 2.2.15 Minerals Management.

4.12 BLM Recreation Opportunity Spectrum

The Recreation Opportunity Spectrum (ROS) is one of the existing tools used by the BLM for classifying recreation environments (existing and desired) along a continuum ranging from primitive, low-use, and inconspicuous administration to urban, high-use, and a highly visible administrative presence. The continuum is composed of six classifications that range from Primitive to Urban. It is important to recognize that the continuum is not about quality. Quality reflects the extent to which a setting meets the recreationists' desires and needs. Camping in a clear cut area is as satisfying to some people as camping in a wilderness is to others. There is nothing intrinsic in the landscape to dictate the best type of opportunity. Modern opportunities in an alpine setting are needed as much as primitive opportunities in deserts or plains (Clark et al, 1979). This continuum recognizes variation among various components of any landscape's physical, social, and administrative attributes; and resulting descriptions (of existing conditions) and prescriptions (of desired future conditions) define recreation setting character. The BLM classified the ROS of the CRMA using three of the six classifications (Figure 4-13), which includes Semi-primitive Motorized, Roaded Natural, and Rural. Descriptions of the six ROS settings follow.

4.12.1 Primitive

(Not present in the CRMA)

- Remoteness: An area designated by a line generally three miles from all open roads, railroads, and motorized trails.
- Evidence of Humans: Setting is essentially an unmodified natural environment. Evidence of humans would be unnoticed by an observer wandering through the area.
- Evidence of trails is acceptable but should not exceed standard to carry expected use.
- Structures are extremely rare.
- Social: Usually less than six parties per day encountered on trails and less than three parties visible at campsites.
- Managerial: Onsite regimentation is low with controls primarily offsite.

4.12.2 Semi-primitive Nonmotorized

(Not present in the CRMA)

- Remoteness: An area designated by a line generally ½ mile from any road, railroad, or trail open to public motorized use. (The guideline for applying the ½ mile criterion is to use ½

mile except where topographic or physical features closer than 1/2 mile adequately screen out the sights and sounds of humans and make access more difficult and slower. For example, if a ridge is 1/4 mile from the road, use the ridge instead of the 1/2 mile.)

- Any roads, railroads, or trails within the semi-primitive nonmotorized areas will have the following characteristics:
 - Closed to public motorized use.
 - Are reclaimed, or in the process of reclaiming (when reclaiming will harmonize with the natural appearing environment). Some examples are old logging roads, old railroad beds, old access routes to abandoned campsites, temporary roads, and gated roads that are used for occasional administrative access.
- Evidence of Humans: Natural setting may have subtle modifications that would be noticed but not draw the attention of an observer wandering through the area.
- Little or no evidence of primitive roads and the motorized use of trails and primitive roads.
- Structures are rare and isolated.
- Social: Usually 6-15 parties per day encountered on trails and six or fewer parties visible from campsite.
- Managerial: Onsite regimentation and controls present but subtle.

4.12.3 Semi-Primitive Motorized

(Present in the CRMA)

- Remoteness: An area designed by a line generally 1/2 mile from open better than primitive roads. (The guideline for applying the 1/2 mile criterion is to consistently use 1/2 mile where topographic or physical features closer than 1/2 mile adequately screen out the sights and sounds of humans, e.g. a ridge 1/4 mile from the road).
- Contains open primitive roads that are not maintained for the use of standard passenger-type vehicles, normally OHVs and high-clearance vehicles, e.g. an old pickup with high clearance. These open roads are generally tracks, ruts, or rocky-rough surface and upgraded and not drained. The roadbeds and cuts are mostly vegetated with grass or native material unless they are too rocky for vegetation. The roads harmonize with the natural environment. Examples include old logging roads from before specified road years, old revegetated railroad beds, old access roads to abandoned home-sites, temporary logging roads that are revegetated, and low standard administrative roads (normally used for access to wildlife openings).
- Evidence of Humans: Natural setting may have moderately dominant alterations but would not draw the attention of motorized observers on trails and primitive roads within the area. Any closed improved roads must be managed to revegetate and harmonize with the natural environment.
- Strong evidence of primitive roads and the motorized use of trails and primitive roads.
- Structures are rare and isolated.
- Social: Low to moderate contact frequency.
- Managerial: Onsite regimentation and controls present but subtle.

4.12.4 Roaded Natural

(Present in the CRMA)

- Remoteness: No criteria.
- Evidence of Humans: Natural setting may have modifications, which range from being easily noticed to strongly dominant to observers within the area. From sensitive travel routes and use areas these alterations would remain unnoticed or visually subordinate.
- There is strong evidence of designed roads, highways, or both.
- Structures are generally scattered, remaining visually subordinate or unnoticed to the sensitive travel route observer. Structures may include utility corridors or microwave installations.
- Social: Frequency of contact is moderate to high on roads; low to moderate on trails and away from roads.
- Managerial: Onsite regimentation and controls are noticeable but harmonize with the natural environment.

4.12.5 Rural

(Present in the CRMA)

- Remoteness: No criteria.
- Evidence of Humans: Natural setting is culturally modified to the point that it is dominant to the sensitive travel route observer. This setting may include pastoral, agricultural, intensively managed wild landscapes, or utility corridors. Pedestrian or other slow-moving observers are constantly within view of culturally changed landscape.
- There is strong evidence of designed roads, highways, or both.
- Structures are readily apparent and may range from scattered to small dominant clusters, including utility corridors, farm buildings, microwave installations, and recreation sites.
- Social: Frequency of contact is moderate to high developed sites, on roads and trails, and water surfaces; moderate away from developed sites.
- Managerial: Regimentation and controls obvious and numerous, largely in harmony with the human-made environment.

4.12.6 Urban

(Not present in the CRMA)

- Remoteness: No criteria.
- Evidence of Humans: Setting is strongly structure dominated. Natural or natural appearing elements may play an important role but be visually subordinate. Pedestrian and other slow moving observers are constantly within view of artificial enclosure of spaces.
- There is strong evidence of designed roads and/or highways and streets.
- Structures and structure complexes are dominant.
- Social: Large numbers of users onsite and in nearby areas.
- Managerial: Regimentation and controls obvious and numerous.

4.12.7 RMP Management Decisions

The RMP's three primary recreation management actions apply to the CRMA, each with specific management sub-actions:

- RM-1: Provide quality recreation opportunities and experiences derived from public land resource values that are responsive to visitor demand and where these values are recognized as the primary resource management consideration above all others.
- RM-2: Provide recreation opportunities and experiences derived from public land resource values that are responsive to visitor demand and where recreation use and program investments are commensurate with the management of other resources and resource uses while sustaining the principal recreation activities and associated qualities and conditions of the area. Manage recreation resources in cooperation with local communities in areas with recreation-dependent economies.
- RM-3: Manage public lands to allow for basic recreation uses and resource stewardship needs. Visitor health and safety would be addressed as needed; use and user conflicts would be kept to a minimum; special recreation permits would be processed in compliance with the primary resource uses of the areas; and recreation impacts to cultural and natural resources would be mitigated as needed.

The management sub-actions are described in detail in the RMP Section 2.2.16 Recreation Management.

4.13 Open Space and Trails

The BLM has identified a limited number of trails within the study area (Figure 4-13). Almost all of the inventoried trails are designated as tertiary roads, which are two-track and unpaved. Many of the older two-track roads were presumably created by ranchers for managing livestock. More than likely, newer two-track roads have been created by increasing OHV activity. Citizens attending Public Meeting #1, identified a single-track trail that occurs at the north end of the Palo Verde mountains, which consists of a loop of less than one mile around a small peak.

The existing trail network is essentially a multi-use system—shared by equestrian, hikers, runners, bicycle, and OHV users alike. These users share the two-track trail system, which is not an uncommon practice in many parts of the country. The limited single-track trails are shared by all users except for two-track OHVs. However, any new planned trail development should consider separating non-motorized users from motorized users wherever possible. Further, providing some equestrian only and mountain bike only trail experiences can be beneficial to increase safety and limit conflicts between user groups.

4.13.1 RMP Management Decisions

The RMP's three primary travel management actions are related to surrounding land uses and apply to the CRMA, each with specific management sub-actions:

- TM-1: All public land is classified as open, closed, or limited, per 43 CFR, 8342.1.

- TM-2: Public use, resource management, and regulatory needs are met by development of a travel management plan and implementation of a comprehensive travel management and transportation system.
- TM-3: Manage the travel management system to protect resources and maintain desired recreation experiences.

The management sub-actions are described in detail in the RMP Section 2.2.17 Travel Management.

4.13.2 Open Space and Trails Planning Timeline

In 2006, the City of Maricopa *General Plan 2025* identified planned path/trail connections that enter and cross the BLM lands along SR 238, SR 84, Vekol Wash, and several section line roads along the western edge of Pinal County. Per the Parks and Open Space element, most of the study area is identified as a future regional park and is a significant component of a western Pinal County open space system. The General Plan also identifies an extensive trail system within the study area, with a trail corridor along the length of the mountain ridges from north to south with connecting corridors across the valley plains.

In 2006-2007, essentially concurrent with the City of Maricopa’s initial planning for a large open space park, Pinal County prepared the OS&TMP recognizing the need for a county wide open space plan. The plan’s purpose is the “foundation of the Open Space and Recreation Element of the *We Create Our Future, Pinal County Comprehensive Plan, 2013*, and it identifies 399,300 acres of existing or planned open space, 802,400 acres of proposed open space, 25,900 acres of restricted use open space, and 168,700 acres of regional parks. The plan reflects the vision of county residents and identifies goals and objectives for the attainments of open space, trails, and regional parks” (Logan Simpson Design, Inc. 2007).

The OS&TMP references the *Statenide Comprehensive Outdoor Recreation Plan: Arizona 2003* (SCORP), whereby 40 percent of Pinal County respondents preferred funding to be directed toward large nature-oriented parks and 27 percent preferred funding to open space. Public comments from stakeholders and public meetings throughout the SCORP preparation process reinforced these findings with additional emphasis placed on special use areas such as equestrian facilities and OHV areas. Similar to the Maricopa *General Plan 2025*, the study area was identified as a critical open space area and as a future regional park. Existing trail routes coincide with the Maricopa *General Plan 2025*, identifying existing (previously) planned corridors along the mountain spines, SR 238, and Vekol Wash. Public meetings for the OS&TMP were held from June 2006 through November 2006 in two meetings groups, with three meetings each across the county. The OS&TMP was approved by the Board of Supervisors in October 2007.

In 2008, the City of Maricopa prepared the *Parks, Trails, and Open Space Master Plan*. The master plan “defines an approach for the next 20 years that will provide a balanced system of conveniently located parks, both active and passive, interconnected paths and trails systems, open spaces and multipurpose recreational facilities...and establishes the basis for future locations of parks, trails, and public open space as the City continues to grow.” The CRMA study area is again identified as a significant component of the western Pinal County’s planned open space system. The master plan “denotes several trails and trailheads within this area in order to accommodate the growing population’s recreation needs. A grassroots campaign by local residents to preserve this area is currently underway. Issues regarding off-road vehicle access to these lands are an ongoing issue. It is

the recommendation of this document that a partnership with the BLM take place before growth encroaches further on this area. The conversion of this land into a park, which includes a management plan for off-road vehicles, would serve not only the recreation needs of the public, but also preserve the habitat value of the land. This site offers a tremendous scenic and recreation opportunity for residents and visitors to the City of Maricopa. This land holds the promise to become the crown jewel of the City of Maricopa's parks" (J2 Engineering and Environmental Design, 2008). The 2008 master plan promotes the opportunity to include the CRMA study area and other open space in the vicinity of Table Top in future planning as designated mountain parks. Additionally, a Juan Batista de Anza Trail/Trailhead Park is proposed on BLM land north of SR 238. These park designations are not only to provide recreation opportunities but also to promote natural resource conservation of these public lands.

In 2016, and concurrent with this master plan, the City of Maricopa is in the process of preparing *Planning Maricopa; Shaping Our Community (Draft)*, the first update to its General Plan. Continuing from the 2006 General Plan, the regional park is expounded upon. The General Plan envisions an even more significant trail system, comprised of backcountry trails, a "Town Trail," and paved paths with wide shoulders throughout the CRMA study area.

4.14 Existing Recreation Related Facilities

There are several tourism and visitor opportunities in the area. Visitors to the CRMA will have the opportunity to lengthen their stay and enjoy other activities and facilities in the area. Within a ten-mile buffer area around the CRMA, public and private recreation facilities were researched and mapped (Figure 4-13). These include:

- 4 outdoor recreation destinations (Sonoran Desert National Monument, Sierra Estrella Wilderness Area, Table Top Wilderness Area, and South Maricopa Mountains Wilderness Area)
- 3 municipal parks
- 3 equestrian arenas, rodeo grounds, and/or riding operations
- 3 aeronautical operations
- 2 golf courses
- 2 campgrounds/Recreational Vehicle (RV) parks
- 2 museums
- 1 proposed motocross track
- 1 bed and breakfast

Within the ten-mile buffer area, the City of Maricopa, Maricopa businesses, and the Ak-Chin Indian Community host several annual events throughout the year. A few of the events include:

- 5K Copa Color Fun Run & Food Truck Festival (February)
- Salsa Festival (March)
- Him-Dak Celebration (April)
- Fishing Derby (April)
- Great American 4th (July)
- Native American Recognition Day (September)

- Stagecoach Days (October)
- Pecan Pride Celebration (October)
- Mud Run (October)
- Mysterious Mansion Mayhem (October)
- Shutter Shots (October)
- Masik Tas (December)
- Merry Copa (December)
- Holiday Homes on Parade (December)

4.14.1 RMP Management Decisions

As this is an inventory of surrounding recreation opportunities and facilities, there are no RMP management decisions that relate directly to existing recreation related facilities.

4.15 Transportation and Vehicular Access Issues

Most of the CRMA can be accessed from several existing local roads off SR 238, SR 347, and SR 84. Many of the roads are paved, with a few remaining unpaved. SR 238 passes through the northern end of the CRMA for a length just over ½ mile. Access to the north from SR 238 West Maricopa Road:

- Three local unpaved roads—Rahma Street, San Rafael Road, and Tijeras Road—provide direct access to the CRMA portion that is north of SR 238. County owned rights-of-way for San Rafael Road and Rahma Street extend approximately ½-mile to the mid-section line. There is no established right-of-way for Tijeras Road.

Access to the south from SR 238 West Maricopa Road is restricted by the Union Pacific Railroad, which is parallel to SR 238 and provides only two at-grade right-of-way crossings in the vicinity. Neither crossing is within the CRMA. In most circumstances, the Union Pacific Railroad will not allow new at-grade crossings for local only access. Constructing a grade separated crossing would be cost prohibitive and not cost effective without other development proposed in the area, which is unlikely for several decades. Access to the south from SR 238 includes the following:

- Rio Bravo/Hidden Valley Road is a paved north-south section line road that provides indirect access to the northern portion of the CRMA. Rio Bravo Road provides an at-grade signalized crossing of the Union Pacific Railroad. About ½-mile south of the railroad, Rio Bravo curves and becomes Hidden Valley Road. South of Fulcar Road, it becomes unpaved and is not a continuous through road to the southern portion of the CRMA. Several unpaved east-west section line roads lead to the eastern edges of the CRMA and can be accessed from Hidden Valley Road. Unpaved distances vary from ½- to 1 ½-mile.
- 83rd Avenue is an unpaved north-south section line road in Maricopa County that is two miles west of the Pinal County line. 83rd Avenue provides an at-grade signalized crossing of the railroad as well. From 83rd Avenue, unpaved road access to the western edge of the CRMA is essentially non-existent or shows that there is very little use. Constructing new paved or unpaved access roads would be circuitous and difficult, and would require extensive partnering and coordination with Maricopa County. Additionally, from SR 238 to I-8, the western edge of the CRMA is paralleled by Waterman Wash in the north and Vekol

Wash in the south. Waterman Wash has been evaluated by FEMA as a Zone A Floodway. Vekol Wash has not been evaluated in Maricopa County, but is also a Zone A Floodway in Pinal County (Figure 4-5). Constructing floodproof crossings of either floodway would be cost prohibitive and not cost effective without other development proposed in the area, which is unlikely for several decades.

Access from SR 347 North Maricopa Road includes the following:

- Farrell Road is a paved east-west section line (and township line) road that provides direct access to the northern portion of the CRMA. It intersects with Hidden Valley Road, see above.
- Papago Road is a paved east-west section line road that provides indirect access to the southern portion of the CRMA. It intersects with Warren Road, see below.
- Clayton and Century Roads are paved east-west section line roads that are offset by 1700 feet at Amarillo Valley Road (a range line). They provide direct access to the CRMA. Currently, pavement ends at Warren Road, where Century Road continues unpaved to the southern portion of the CRMA, and is an unpaved distance of one mile.

From SR 84 Gila Bend Highway:

- Ralston Road is a paved north-south section line road that provides indirect access to the southern portion of the CRMA via Robbin Road, which terminates at the CRMA. Robbin Road is an east-west section line (and township line) road. It is paved to Warren Road and unpaved from Warren Road to the CRMA, which is an unpaved distance of one mile.
- Warren Road, via east-west Robbin Road, is a paved north-south section line road from Robbin Road to Papago Road. Several unpaved east-west section line roads lead to the eastern edges of the CRMA and can be accessed from Warren Road. Unpaved distances vary from one to three miles.

I-8 passes through the southern end of the CRMA for a length of approximately 3 miles. However, there is no access to the CRMA from right-of-way controlled I-8.

With numerous existing adjacent and parallel roads, controlling access to each of the two contiguous CRMA portions through one or two “gate” locations from a manpower and law enforcement perspective is not likely feasible nor easily enforceable. Therefore, consideration should be given to establishing an access policy for this open space area/mountain park that does not provide unlimited access points but is flexible to the future of the CRMA. Existing legal access may continue to exist “as is” depending on the future phasing of the CRMA.

4.15.1 Hidden Valley Transportation Framework Study

The Maricopa Association of Governments (MAG) and the Arizona Department of Transportation conducted roadway studies in the area. The latest, conducted by MAG, is the *I-8/I-10 Hidden Valley Transportation Framework Study* (AECOM, 2009). The purpose of the study was to initiate the transportation planning process in large areas that are expected to experience intense growth and development over the next 30 to 50 years. The study area, which encompasses approximately 3,000 square miles (larger than the state of Delaware), is situated in Maricopa and Pinal counties. Its boundaries are generally the Gila River on the north, the I-8 corridor on the south, Overfield Road (east of I-10) on the east, and 459th Avenue in Maricopa County on the west. MAG and its partners,

which include Pinal County, began broad-brush planning in advance of growth. The planning timeframes are 2030 and buildout, which may occur after 2050. (AECOM 2009).

The framework study was finalized in October 2009. The recommended alternative is synthesized on Exhibit-XX. All of the framework routes should be viewed as generalized corridors, not specific alignments. Specific locations for roadway and transit facilities will be established in future planning and design studies. However, SR 238 is designated to be upgraded to an improved freeway. In addition to SR 238 and I-8, four new transportation corridors are planned to traverse or abut the CRMA.

- Bisecting through the Hidden Valley area is the proposed Loop 303 Hassayampa Freeway.
- Paralleling the western side of the CRMA is a north-south Loop 303 freeway spur, connecting Loop 303 and I-8.
- An east-west parkway corridor is planned in the vicinity of Val Vista Road.
- An east-west parkway corridor is planned in the vicinity between Barnes and Century Roads.

As generally proposed, these transportation improvements will significantly alter the rural and isolated setting of the Hidden Valley area. Improved and increased vehicular access will undoubtedly make the area more attractive as natural open space and for public recreation opportunities. A currently developing example that could be a future Hidden Valley setting is the City of Phoenix South Mountain Park. Only a few decades ago, a freeway around South Mountain was simply a line on a map representing a future corridor. Loop 202 is now scheduled to be constructed from I-10 on the north to I-10 on the east by early 2020, completely encircling the open space mountain park and surrounding the residential region with freeways. The land that makes up South Mountain Park was also once owned by the federal government, which was sold to the City of Phoenix in 1924 (prior to the creation of the R&PPA in 1954).

4.15.2 RMP Management Decisions

As this is a discussion for public access to the CRMA and future transportation planning, there are no RMP management decisions that relate directly to transportation and vehicular access issues.

4.16 Utilities

4.16.1 Water

There are no known water services/facilities within the CRMA. In the rural area east of the CRMA, there are hundreds of private wells presumably providing water to individual residential properties. Depth to water below ground surface ranges from 75 feet to over 550 feet (Arizona Department of Water Resources 2010). In addition to these, there are several water providers and water coops as well. Some provide water to just a few residential lots while others to several hundred lots. The nearest apparent water facilities are located on Farrell Road west of Hidden Valley Road, which is operated by the Palo Verde Mountain Community Water Coop. Per the Arizona Department of Water Resources Well Registry, depth to water below ground surface is 527 feet at this well. The nearest water providers and water coops include:

- Palo Verde Mountain Community Water Coop., Located in T4S, R2E, Section 33 (northwest of Farrell Road and Hidden Valley Road).

- Thunderbird Farms North. Located in T5S, R2E, Section 2 (southeast of Farrell Road and Warren Road).
- Papago Buttes Ranchos. Located in T5S, R2E, Sections 13 and 24 (southeast of Peters & Nall Road and Ralston Road).
- Hacienda Acres. Located in T6S, R2E, Section 4 (southeast of Miller Road and Sage Street).
- Antelope Peak Domestic Water Improvement District. Located in T6S, R2E, Section 35 (northwest of Robin Road and Ralston Road).

4.16.2 Sewer

There are no known sewer services/facilities within the CRMA. In the rural area east of the CRMA, there are no fully developed subdivisions. The residences in this low density area are presumably on individual septic systems. The Pinal County Environmental Health Department approves and permits septic systems as delegated by the Arizona Department of Environmental Quality.

4.16.3 Electricity

There are existing and proposed high-voltage electrical transmission power line corridors that cross or are adjacent to the CRMA (Figure 4-11). The electric service provider for the area is APS. Development in the CRMA must include consideration for the power line corridors to ensure that APS' facilities and easements are not adversely affected by development of any proposed components of the CRMA.

As the area is developing as a low-density residential area, there are medium- and low-voltage overhead power lines on most section line roads. Many of these power lines extend to near the BLM boundary. Therefore, electric infrastructure should be readily available to extend to points of need within the CRMA from the rural residential community. However, upgraded infrastructure may be required for a higher demand facility such as a campground (with 30- and 50-amp RV electric hook-ups at most campsites), visitor center, or similar at one or more developed locations within the CRMA.

4.16.4 Natural Gas

The El Paso Natural Gas Company maintains an easement that crosses the Hidden Valley area between the Palo Verde Mountains and Haley Hills. The easement crosses the southwest corner of the northern portion of the CRMA.

4.16.5 RMP Management Decisions

As this is a discussion of utilities that are available in the area, there are no RMP management decisions that relate directly to utilities. However, one scoping issue discusses utility corridors and several sub-management decisions impact existing utility corridors. See the RMP for:

- 2.1.4 Issues Addressed, Item #5, How will renewable and traditional energy facilities and transmission corridors be managed?
- Cultural and Heritage CH-1.1.5. Public use sites will be exclusion areas for utility-scale energy development.
- Vegetation Resources VM-3.1.3. Monitoring for invasive species in corridors.

- Wildland Fuels WF-2.1.1. Reduction of hazardous fuels in corridors.
- Wildlife and Special Status Species WL-1.1.3. Vegetation management restricted to authorized corridors.
- Wildlife and Special Status Species WL-6.1.5. Category I and II tortoise habitat to be exclusion areas for utility development.
- Areas of Critical Environmental Concern AC-1.1.9. ACECs excluded from utility-scale development.
- Areas of Critical Environmental Concern AC-1.1.10. New major land use allocations will be excluded outside the corridors.
- National Trails NT-1.1.7. Anza corridors are exclusion areas for utility-scale energy development.
- National Trails NT-1.1.8. Anza corridors are exclusion areas for minor linear and non-linear land use allocations.

4.17 Drive Time Analysis

An analysis was prepared to identify the areas that are within a 15-, 30-, and 45-minute drive time to whichever is closest to one of two hypothetical entry points to the CRMA from the east, one being Farrell Road and the other Century Road (Figure 4-13). Maricopa and Stanfield are at the edge of the 15-minute zone. Casa Grande is at the edge of the 30-minute zone. The 45- minute zone extends well into Phoenix to north of Sky Harbor Airport, along I-10 to southeast of Picacho, south along Indian Route 15 to North Komelik, and along I-8 to west of Gila Bend. A goal of the OSTMP discusses “ensuring a service level access to regional and national recreational open space within a 30-minute drive” for citizens. The projections below are based on this 30-minute drive service level.

The drive time zones were placed onto a 2010 Census Tract data set to determine census tracts to include in the population evaluation. Census tracts that were more than 50% within the 30 minute zone were kept for the evaluation; those that were less than 50% within the 30 minute zone were omitted. From this evaluation, in 2010 there was an estimated population of 65,858 within a 30-minute drive time.

| Year | Pinal County Population | Population Change per Decennial | Population % Change per Decennial | 30-Minute Drive Zone Projection |
|-------------|--------------------------------|--|--|--|
| 2010 | 375,770 | ----- | ----- | 65,858 |
| 2020 | 463,463 | 87,693 | 18.9% | 78,319 |
| 2030 | 604,767 | 141,304 | 23.4% | 96,618 |
| 2040 | 800,707 | 195,940 | 24.5% | 120,262 |
| 2050 | 1,035,523 | 234,815 | 22.7% | 147,532 |

* Arizona Department of Administration, Office of Employment & Population Statistics, 12/11/15

Presented in Table 4-1 are Pinal County population projections from the Arizona Department of Administration for 2020, 2030, 2040, and 2050 using the Medium Series. Based on these county-wide growth estimates, the potential growth in population within the 30-minute drive time zone could increase 224% by the year 2050 to approximately 147,532. This population estimate is a guide to estimate user demand of the proposed regional park's facilities.

| | |
|------------------------------------|---------|
| Cave Creek Regional Park | 300,625 |
| Estrella Mountain Regional Park | 801,960 |
| McDowell Mountain Regional Park | 62,841 |
| San Tan Mountain Regional Park | 51,775 |
| Spur Cross Ranch Conservation Area | 125,108 |
| Usery Mountain Regional Park | 722,720 |
| White Tank Mountain Regional Park | 160,851 |

*Maricopa County Parks and Recreation Strategic System Master Plan, 2009

For comparison, presented in Table 4-2 are 2007 population projections within a 30-minute drive time of the seven comparable Maricopa County Parks and Recreation Department mountain parks. From this comparison, the population within a 30-minute drive time of the proposed Palo Verde Regional Park is estimated to be most similar to McDowell Mountain Regional Park, which is also of comparable size at 21,416 acres. Attendance at McDowell Mountain Regional Park was 70,992 in fiscal year 2016 and 78,795 in fiscal year 2015. It is important to note that there is currently a higher estimated population within 30 minutes of the proposed regional park than there is within 30 minutes of the existing San Tan Mountain Regional Park. Attendance at San Tan Mountain Regional Park was 146,322 in fiscal year 2016 and 103,365 in fiscal year 2015.

However, true user demand at the proposed regional park will be driven by the unique characteristics of the proposed regional park and the facilities, programs, and/or recreation opportunities provided, albeit very similar to both McDowell Mountain and San Tan Mountain Regional Parks.

4.18 Composite Site Analysis

A primary goal for the RAMP is to have the Palo Verde Regional Park and associated public lands be used for public recreation without causing extensive degradation of the natural resources of the CRMA. In fact, sound recreation management and appropriate, limited development will lessen further impacts and improve existing conditions while accommodating additional recreational users, which are expected with future development of the western Pinal County and Maricopa urban area. The preceding sections identify the inventory and analysis of data that was readily available for the CRMA, including both natural resources and human created/developed elements. The Site Analysis (Figure 4-17) portrays a composite overlay analysis of these resources and elements as a guideline for development and public recreation in the CRMA. The Site Analysis provides the framework for

future planning decisions to be made with the conservation of the CRMA's resources in mind. This will allow for the sustained use of the land without degradation of the natural resources and the Sonoran Desert's inherent beauty, while still achieving the goals for the proposed recreation area.

Of the inventory data available, the Site Analysis overlays the BLM Route Inventory, Pinal County Routes, FEMA Flood Zones, BLM Visual Resource Management, Slope, and Land Ownership. These six provide the most detail available to depict opportunities and constraints across the CRMA. Other inventory data discussed in previous sections are valuable to study in detail. However, the information largely applies to the entire CRMA in general (example: Vegetation and Biology), applies to specific areas that should be addressed in site specific studies in greater detail (example: Cultural, Historic, and Prehistoric Resources and Soil Resources), or doesn't significantly impact the operation and management of Palo Verde Regional Park (example: Existing Grazing Leases/BLM Land Use Activities and Existing Recreation Related Facilities).

When future trail and facility development occurs in the CRMA, a detailed site analysis should be performed during the planning and design process. A detailed site analysis, which produces a comprehensive evaluation of the property, begins with the production of primary base map information including size of area, soil types, topography, stormwater flow courses, and potential utilities. Field reconnaissance will provide a thorough firsthand look at the existing physical and environmental components of the site, including its vegetation, existing structures, areas of poor drainage, topography, sensitive ecological features, views, and the general character of their location within the context of the site. Each of these characteristic components is combined to determine the location and orientation of the facility's programmed elements, such as entry, parking, roads, and buildings/structures and the best alignment for trails and roads. The data and information gathered and assessed during a site analysis is used to form an understanding of the facility setting's overall characteristics as well as its existing opportunities and challenges for active and passive recreation development.

Palo Verde Regional Park

Landforms

Project Features

- Proposed Regional Park Boundary

Resource Features

- Contours (100 ft. Interval)

Reference Features

- Interstate
- Highways
- Major Roads
- Railroad
- Stream/Wash
- County Boundary
- Indian Community Boundary
- Sonoran Desert National Monument
- Lower Gila Terraces and Historic Trails ACEC



Sources

Bureau of Land Management, Arizona State Office, 2014
 USGS, 2015
 ESRI Street Map, 2013
 Pinal County, 2015

December 10, 2015

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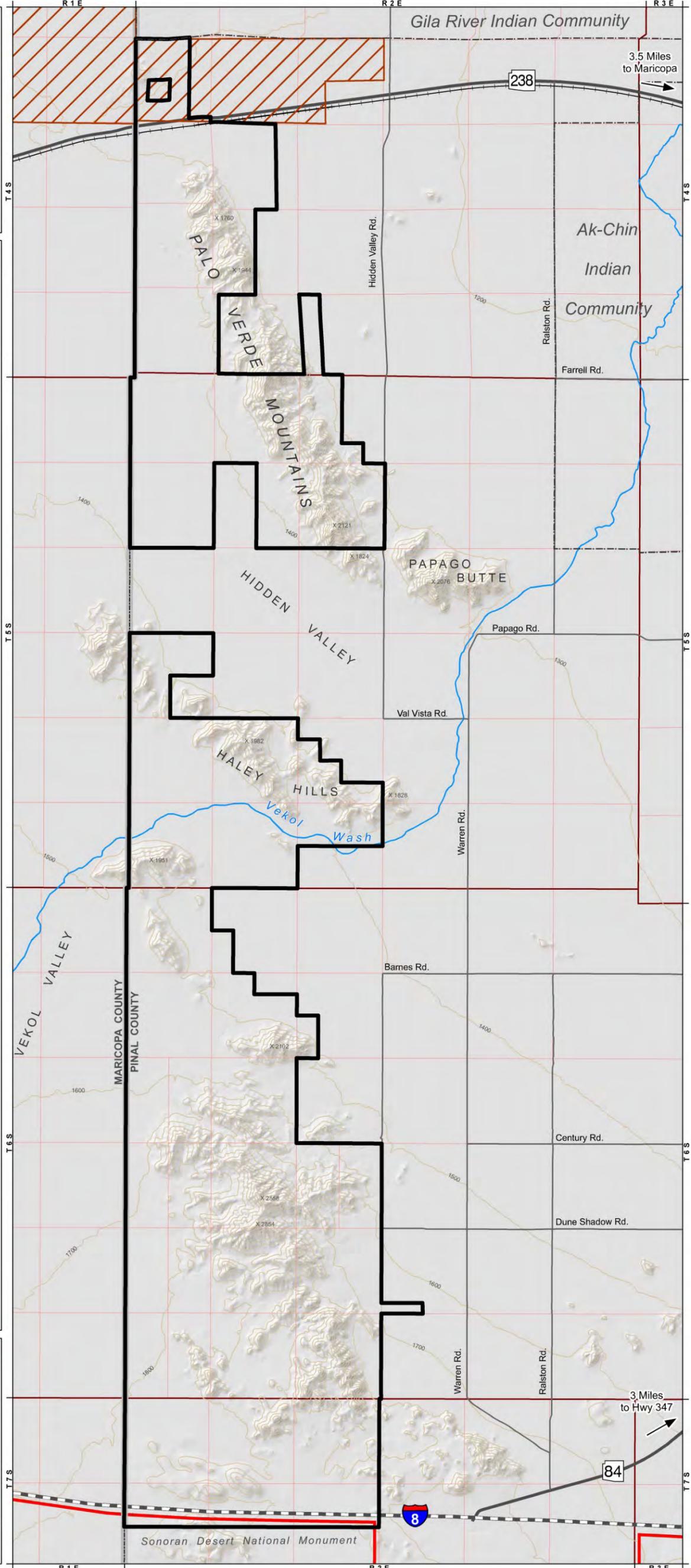


Figure 4-1 Landforms

Palo Verde Regional Park

Soils

Project Features

Proposed Regional Park Boundary

- ### Resource Features
- #### Soil Type (Group)
- Cherioni-Rock outcrop complex, 5 to 60 percent slopes
 - Dateland fine sandy loam
 - Denure fine sandy loam, 0 to 1 percent slopes
 - Denure sandy loam, 1 to 3 percent slopes
 - Denure very gravelly sandy loam, 1 to 8 percent slopes
 - Dumps-Pits association
 - Gunsight-Cipriano complex, 1 to 8 percent slopes
 - Mohall sandy loam
 - Mohall-Denure association
 - Momoli-Carrizo complex, 1 to 8 percent slopes
 - Pinamt-Momoli complex, 1 to 8 percent slopes
 - Quilotosa-Rock outcrop complex, 5 to 60 percent slopes
 - Tremant-Denure complex
 - Vaiva-Rock outcrop complex, 15 to 50 percent slopes
 - Vaiva-Rock outcrop complex, 2 to 15 percent slopes
 - Valencia sandy loam
 - Why sandy loam

- ### Reference Features
- Interstate
 - Highways
 - Major Roads
 - Railroad
 - Stream/Wash
 - County Boundary
 - Indian Community Boundary
 - Sonoran Desert National Monument



Sources

Bureau of Land Management, Arizona State Office, 2014
 USGS, 2015
 ESRI Street Map, 2013
 Pinal County, 2015

December 10, 2015

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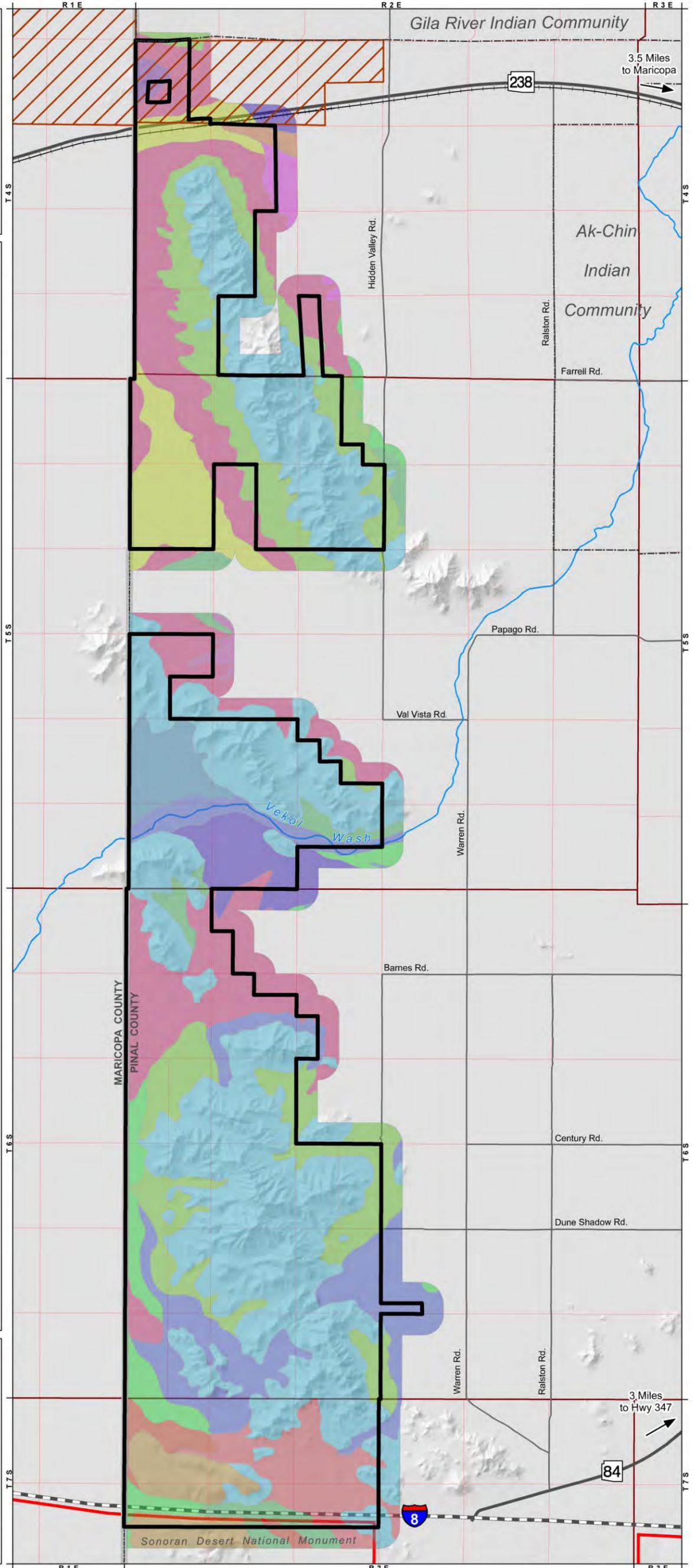


Figure 4-2 Soils

Palo Verde Regional Park

Vegetation

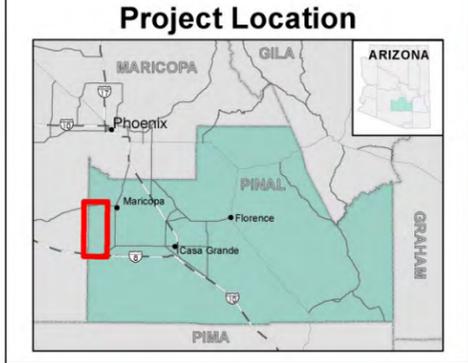
Project Features

- Proposed Regional Park Boundary

Resource Features

- #### Vegetation Type
- Agriculture
 - Apacherian-Chihuahuan Mesquite Upland Scrub
 - Barren Lands, Non-specific
 - Developed, Medium-High Intensity
 - Developed, Open Space-Low Intensity
 - Invasive Southwest Riparian Woodland and Shrubland
 - North American Warm Desert Riparian Mesquite Bosque
 - North American Warm Desert Riparian Woodland and Shrubland
 - Open Water
 - Sonora-Mojave Creosotebush-White Bursage Desertscrub
 - Sonora-Mojave Mixed Salt Desertscrub
 - Sonoran Paloverde-Mixed Cacti Desertscrub

- #### Reference Features
- Interstate
 - Highways
 - Major Roads
 - Railroad
 - Stream/Wash
 - County Boundary
 - Indian Community Boundary
 - Sonoran Desert National Monument
 - Lower Gila Terraces and Historic Trails ACEC



Sources

Bureau of Land Management, Arizona State Office, 2014
 USGS, 2015
 ESRI Street Map, 2013
 Pinal County, 2015

December 10, 2015

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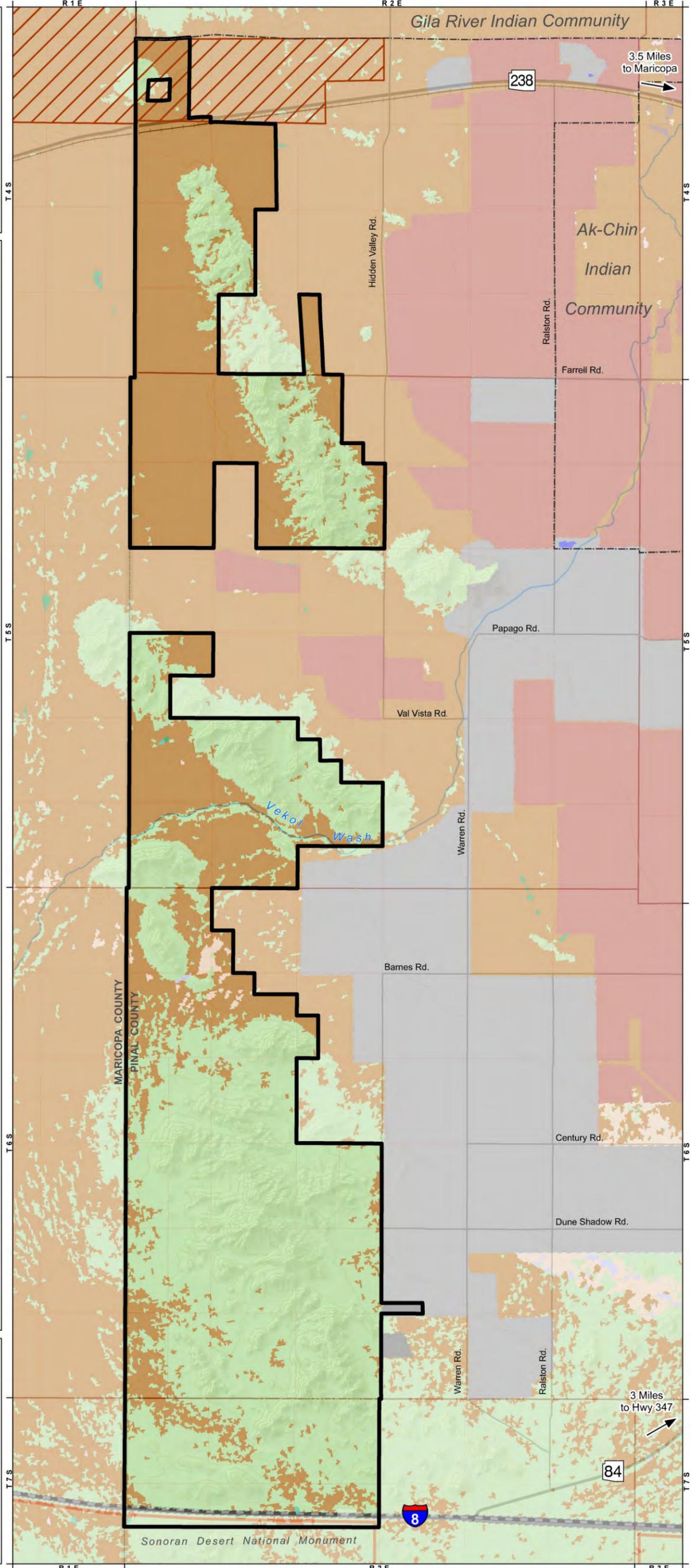


Figure 4-3 Vegetation

Palo Verde Regional Park

Visual Resources



PINAL COUNTY
wide open opportunity

Project Features

-  Proposed Regional Park Boundary

Resource Features

Visual Resource Management (VRM) Classes
Bureau of Land Management (BLM)
VRM Class Objectives

-  VRM Class II - To retain the existing character of the landscape. The level of change to the characteristic landscape should be low.
-  VRM Class III - To partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate.
-  VRM Class IV - To provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.

Reference Features

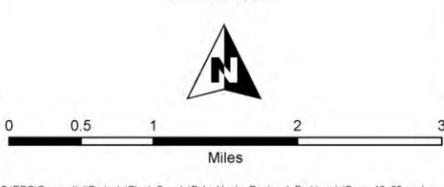
-  Interstate
-  Highways
-  Major Roads
-  Railroad
-  Stream/Wash
-  County Boundary
-  Indian Community Boundary
-  Sonoran Desert National Monument
-  Lower Gila Terraces and Historic Trails ACEC



Sources

Bureau of Land Management, Arizona State Office, 2014
USGS, 2015
ESRI Street Map, 2013
Pinal County, 2015

December 10, 2015



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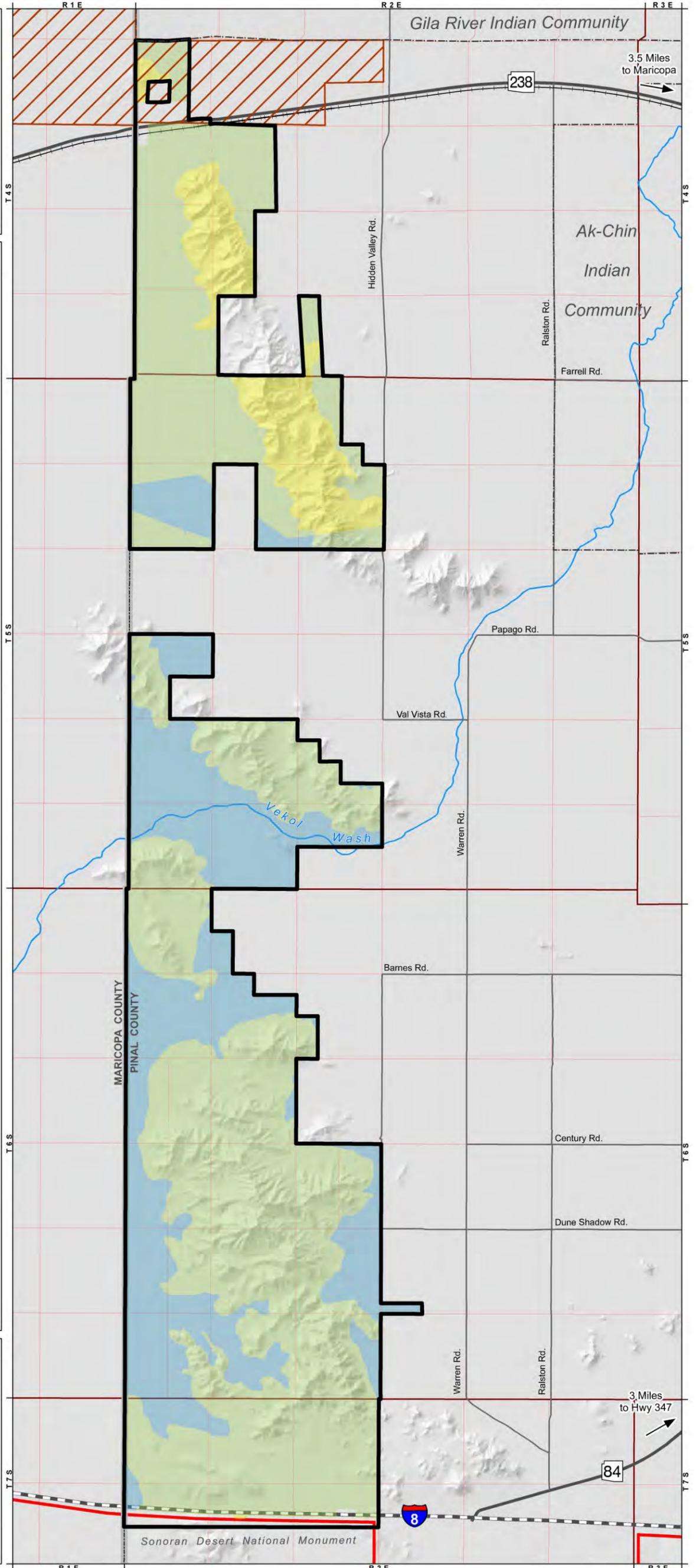


Figure 4-4 Visual Resources

Palo Verde Regional Park

FEMA Flood Zones



PINAL COUNTY
wide open opportunity

Project Features

 Proposed Regional Park Boundary

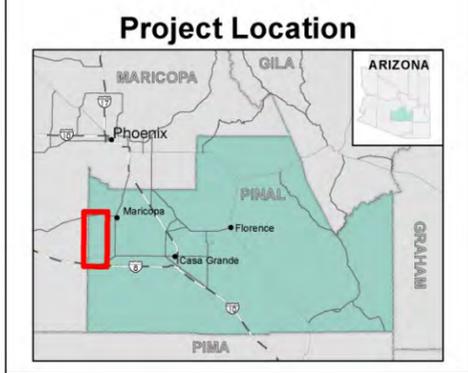
Resource Features

Flood Zones

-  A
-  AE
-  AH
-  AO
-  D
-  X

Reference Features

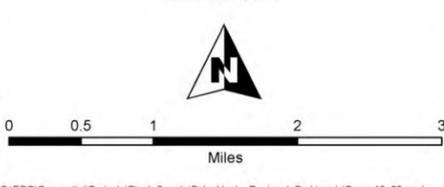
-  Interstate
-  Highways
-  Major Roads
-  Railroad
-  Stream/Wash
-  County Boundary
-  Indian Community Boundary
-  Sonoran Desert National Monument
-  Lower Gila Terraces and Historic Trails ACEC



Sources

Bureau of Land Management, Arizona State Office, 2014
 USGS, 2015
 ESRI Street Map, 2013
 Pinal County, 2015
 FEMA, 2015

December 10, 2015



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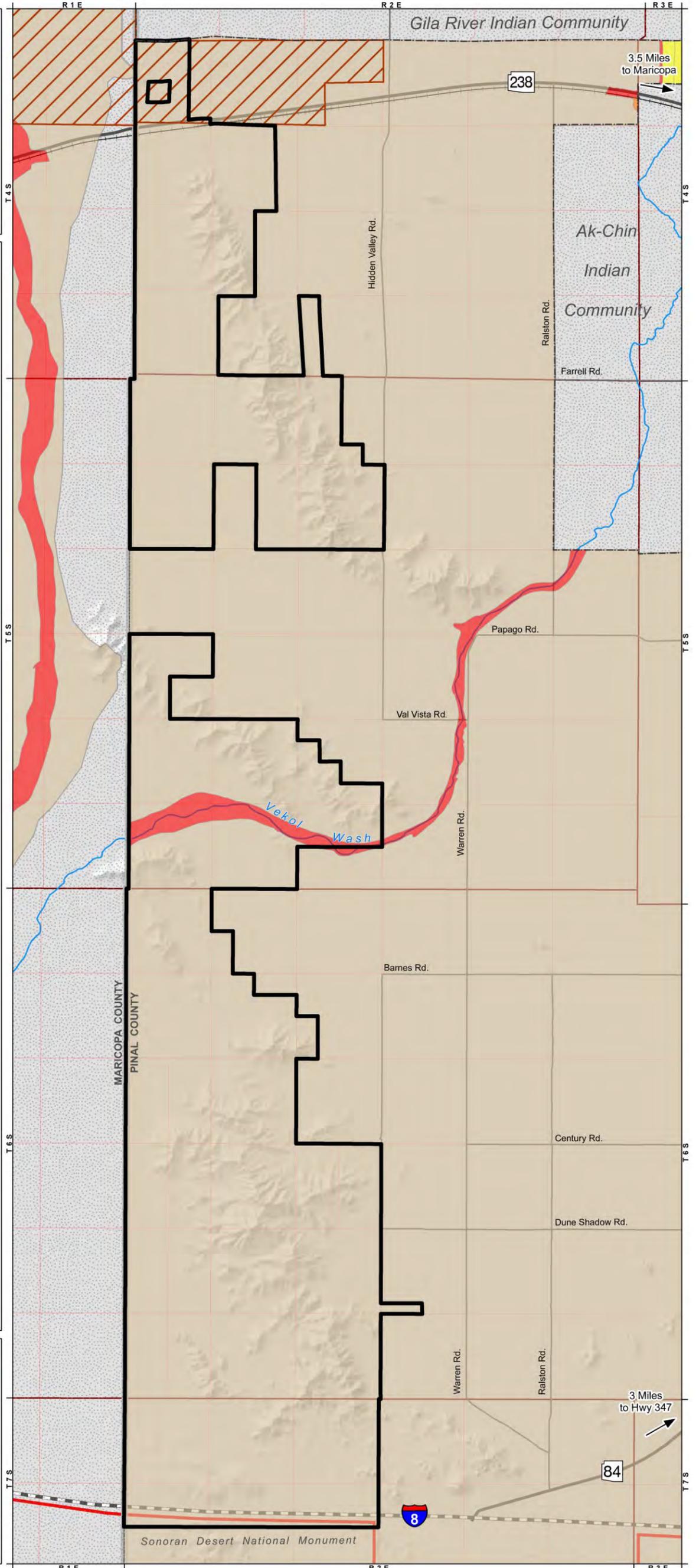


Figure 4-5 FEMA Flood Zones

Palo Verde Regional Park

Biological Resources Map A

Project Features

Proposed Regional Park Boundary

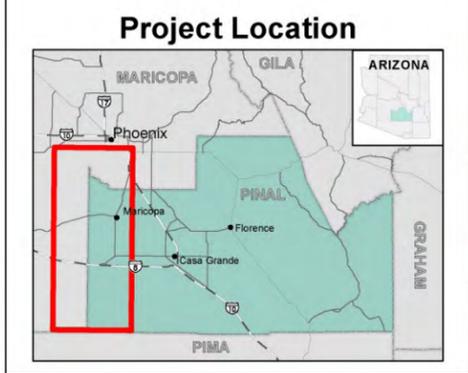
Resource Features

Wildlife Connectivity Assessments: Pinal and Maricopa Counties

- Barrier** – A manmade feature that impedes wildlife movement through a linkage. These can include highways, other roads, canals, railroads, urban development, and other features. This map depicts some but not all major barriers to wildlife movement.
- Diffuse Movement Area** – A type of wildlife linkage in which animals move within a habitat block across a relatively broad area, rather than between habitat blocks through a well-defined linkage.
- Landscape Movement Area** – A type of wildlife linkage in which animals move between distinct habitat blocks; the area may be relatively broad or through a well-defined linkage.
- Riparian Movement Area** – A type of wildlife linkage that includes vegetation, habitats, or ecosystems that are associated with bodies of water or are dependent on perennial or ephemeral water drainage, including desert washes. Riparian linkages facilitate movement of both terrestrial and aquatic wildlife species.

Reference Features

- Interstate
- Highways
- Major Roads
- Railroad
- Stream/Wash
- County Boundary
- Sonoran Desert National Monument
- Lower Gila Terraces and Historic Trails ACEC



Sources

Bureau of Land Management, Arizona State Office, 2014
 USGS, 2015
 ESRI Street Map, 2013
 Pinal County, 2015
 Arizona Game and Fish Department, 2013
 The Pinal County Wildlife Connectivity Assessment: Report on Stakeholder Input
 Arizona Game and Fish Department, 2012
 The Maricopa County Wildlife Connectivity Assessment: Report on Stakeholder Input

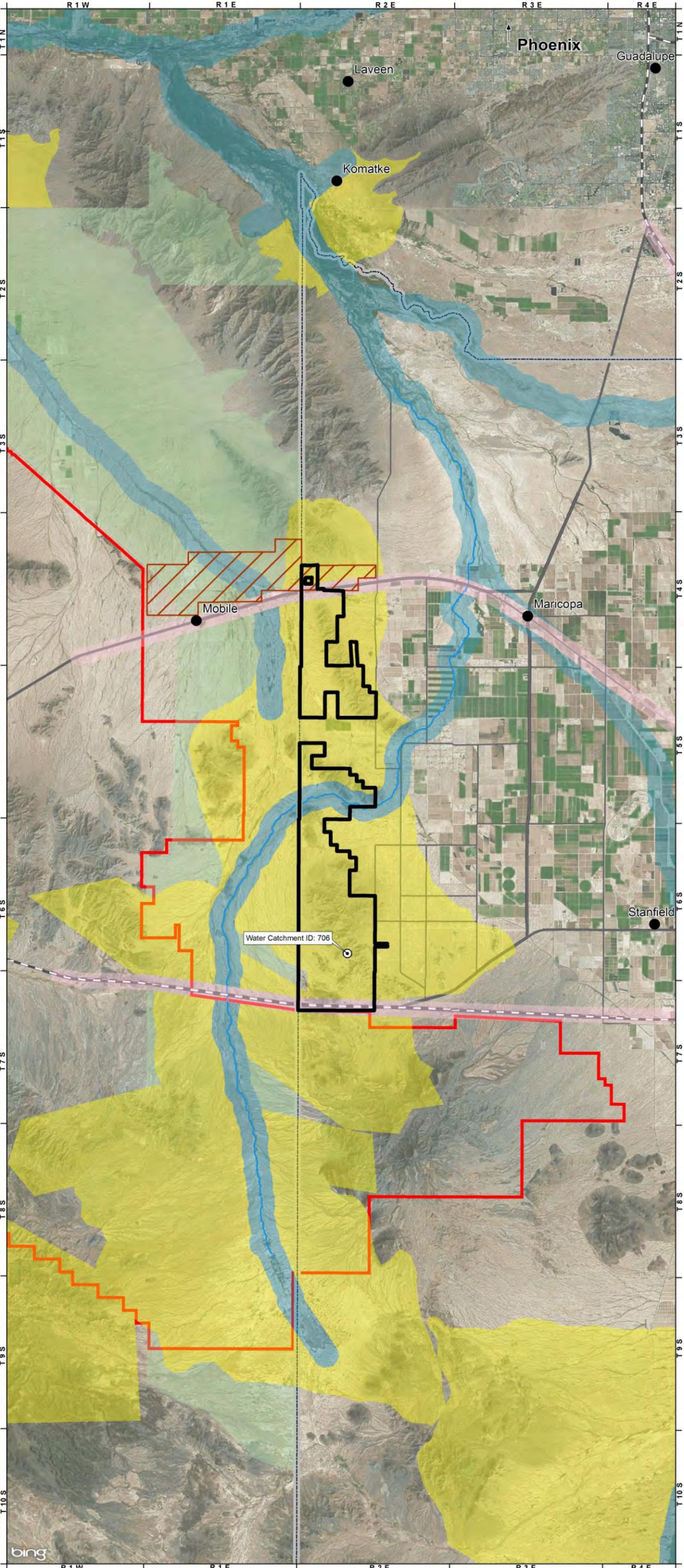
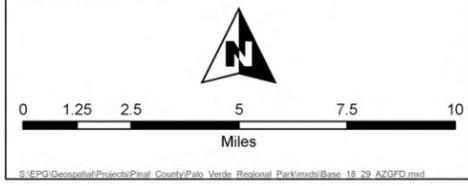


Figure 4-6 Biological Resources Map A

Palo Verde Regional Park

Biological Resources Map B



Project Features

 Proposed Regional Park Boundary

Resource Features

Arizona Missing Linkage Designs
Beier et al. 2008

 Gila Bend - Sierra Estrella Linkage

Desert Tortoise Habitat (BLM)
 Category II

Wildlife Movement Corridor
BLM Lower Sonoran Field Office RMP
 Vekol Valley to Sonoran Desert National Monument (BLM)

*Note: Entire project area within Sonoran Pronghorn Experimental Population Area

Reference Features

-  Interstate
-  Highways
-  Major Roads
-  Railroad
-  Stream/Wash
-  County Boundary
-  Indian Community Boundary
-  Sonoran Desert National Monument
-  Lower Gila Terraces and Historic Trails ACEC

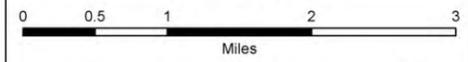
Project Location



Sources

Bureau of Land Management, Arizona State Office, 2014
Bureau of Land Management, Lower Sonoran Field Office, 2012
USGS, 2015
ESRI Street Map, 2013
Pinal County, 2015
Beier et al. 2008, Arizona Missing Linkages:
Gila Bend - Sierra Estrella Linkage Design

December 10, 2015



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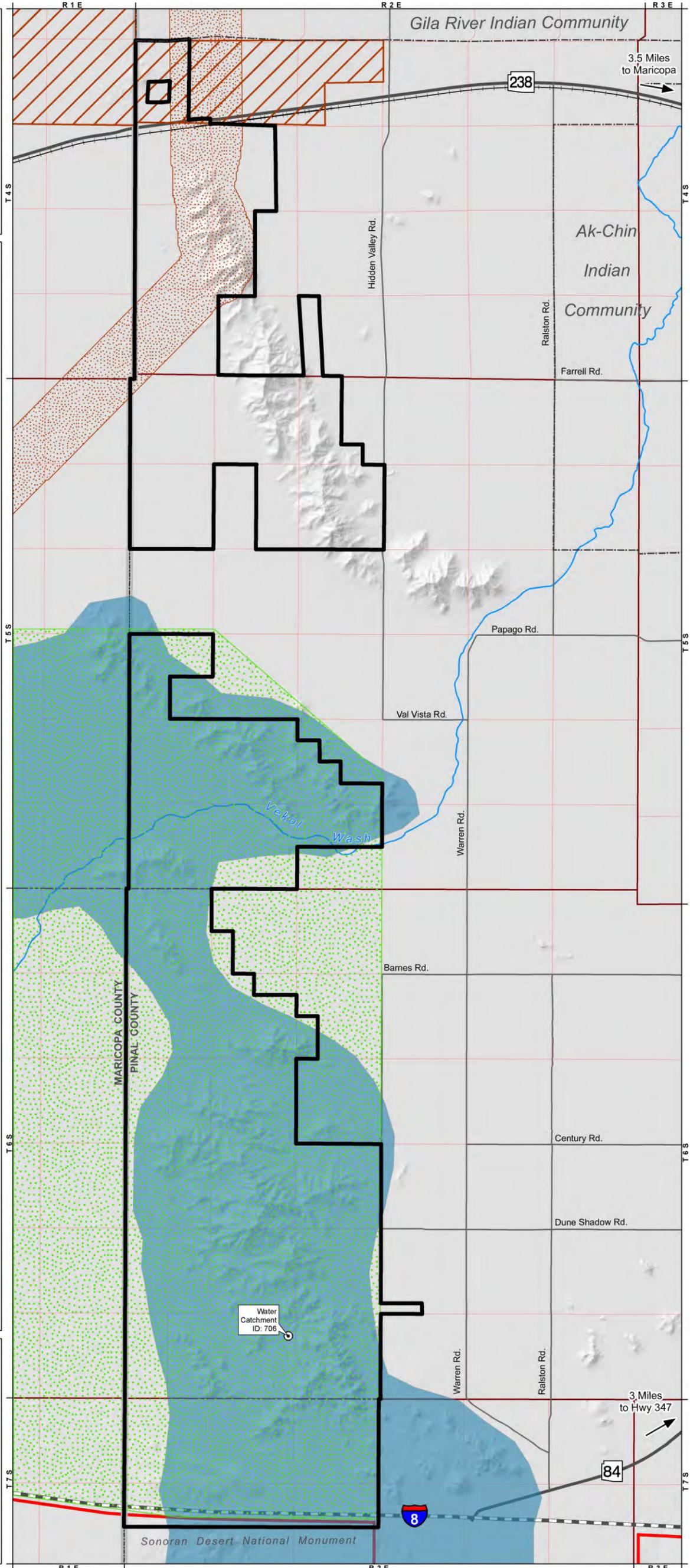


Figure 4-7 Biological Resources Map B

Palo Verde Regional Park

Land Use



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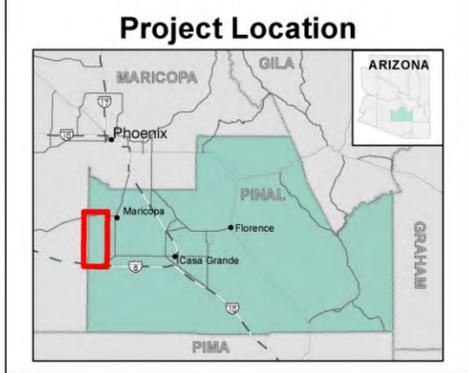
Project Features

 Proposed Regional Park Boundary

- ### Resource Features
- #### Pinal County Land Use
-  Low Density Residential
 -  Moderate Density Residential
 -  Activity Center
 -  Commercial
 -  Employment Area
 -  Public Facility/Services
 -  Open Space
- #### Planned Area Developments
- 1 - Babe's Ranch
 - 2 - Cactus Springs
 - 3 - Gunnala Farms
 - 4 - Hidden Valley
 - 5 - Hidden Valley Estates
 - 6 - Maricopa Opus
 - 7 - Papago Estates
 - 8 - Sunset Mountain
 - 9 - Vintage Estates

- #### Maricopa County Land Use
-  Low Density Residential
 -  Rural Development Area
 -  Open Space

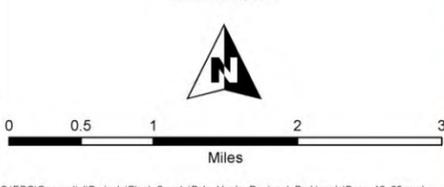
- ### Reference Features
-  Interstate
 -  Highways
 -  Major Roads
 -  Railroad
 -  Stream/Wash
 -  County Boundary
 -  Indian Community Boundary
 -  Sonoran Desert National Monument
 -  Lower Gila Terraces and Historic Trails ACEC



Sources

Bureau of Land Management, Arizona State Office, 2014
 USGS, 2015
 ESRI Street Map, 2013
 Pinal County, 2015

December 10, 2015



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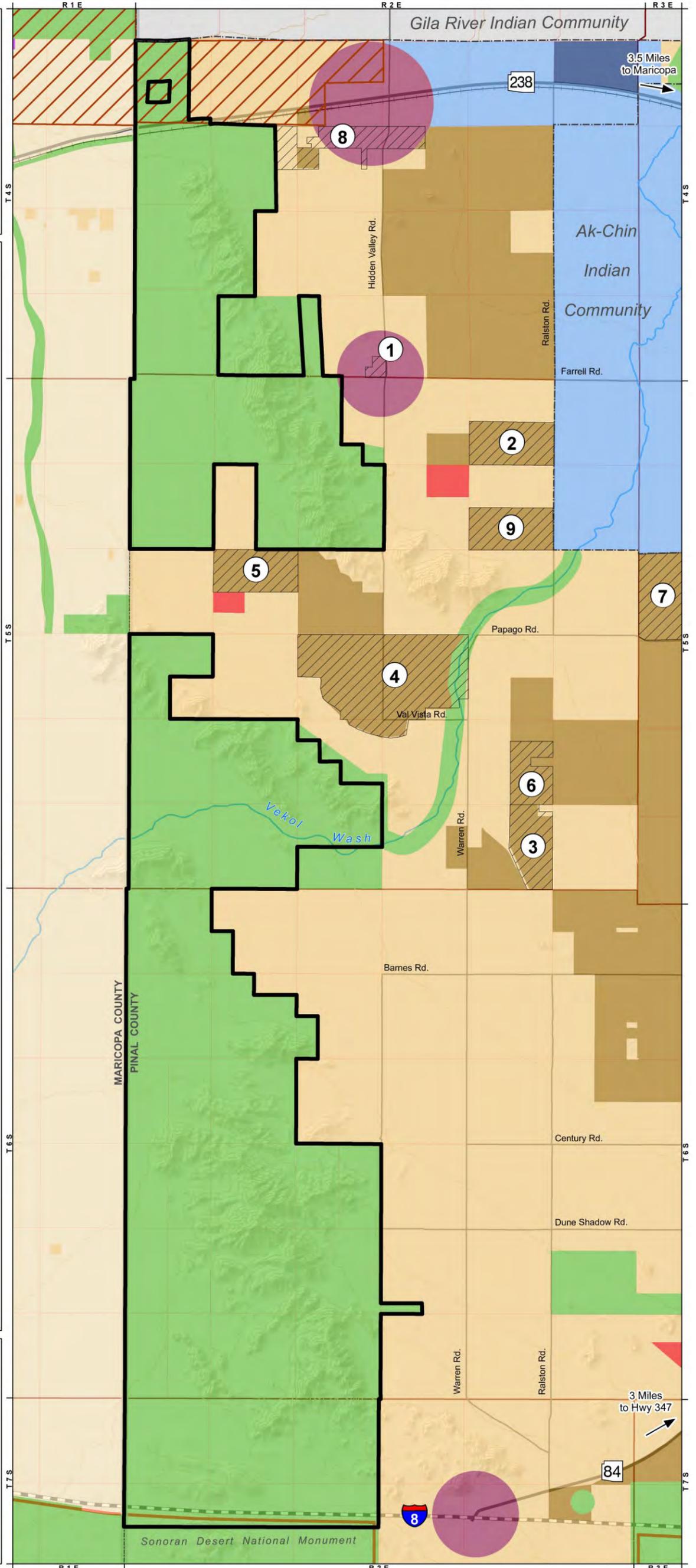


Figure 4-8 Land Use

Palo Verde Regional Park

Project Location



Project Features

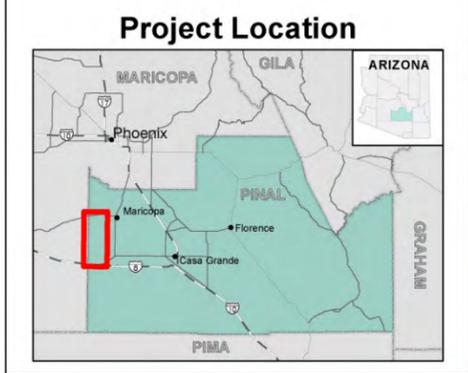
-  Proposed Regional Park Boundary

Land Ownership

-  State Trust Land
-  Indian Reservation
-  Bureau of Land Management
-  Private/Other

Reference Features

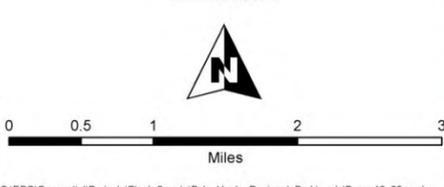
-  Interstate
-  Highways
-  Major Roads
-  Roads
-  Other Roads
-  Railroad
-  Stream/Wash
-  County Boundary
-  Indian Community Boundary
-  Sonoran Desert National Monument
-  Lower Gila Terraces and Historic Trails ACEC



Sources

Bureau of Land Management, Arizona State Office, 2014
 USGS, 2015
 ESRI Street Map, 2013
 Pinal County, 2015

December 10, 2015



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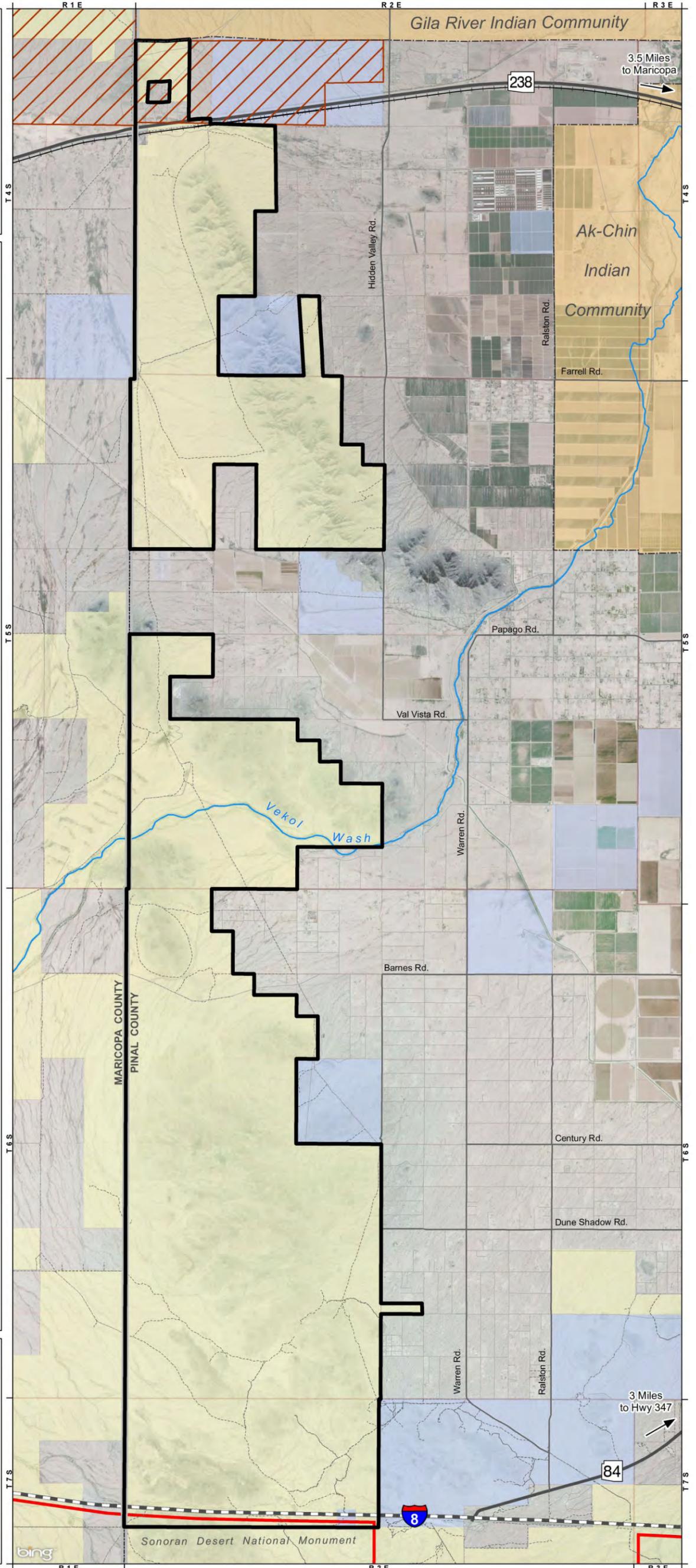


Figure 4-9 Land Ownership

Palo Verde Regional Park

Grazing Allotments

- Project Features**
- Proposed Regional Park Boundary
- Resource Features**
- Grazing Allotments (BLM)**
- Grazing Allotment Boundary
- Reference Features**
- Interstate
 - Highways
 - Major Roads
 - Railroad
 - Stream/Wash
 - County Boundary
 - Indian Community Boundary
 - Sonoran Desert National Monument
 - Lower Gila Terraces and Historic Trails ACEC



Sources

- Bureau of Land Management, Arizona State Office, 2014
- USGS, 2015
- ESRI Street Map, 2013
- Pinal County, 2015

December 10, 2015

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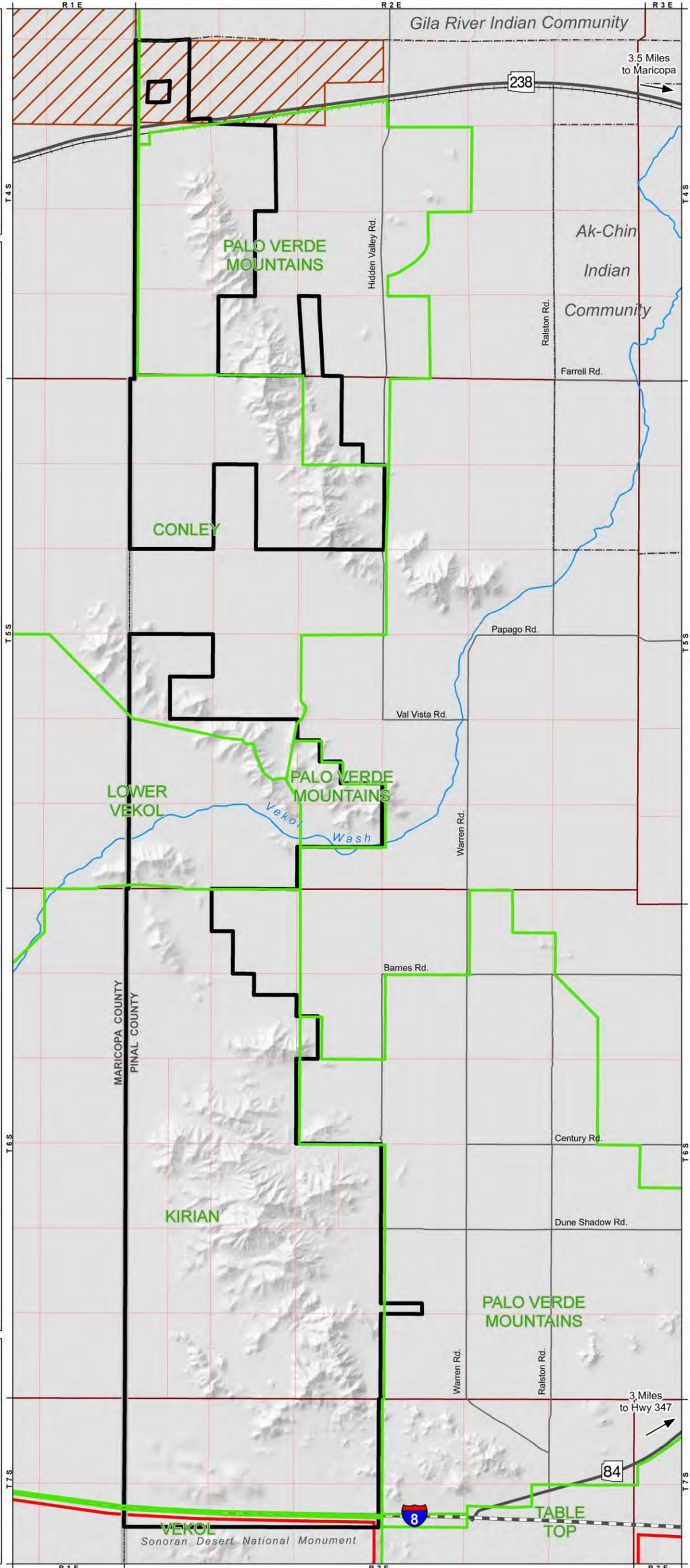


Figure 4-10 Grazing Allotments

Palo Verde Regional Park

BLM Recreation



Project Features

-  Proposed Regional Park Boundary

Resource Features

Recreation Opportunity Spectrum (BLM)

Rural - Altered landscape with natural backdrop. Ranches, administrative sites, and moderately developed resorts are present. Travel routes highly developed with classified road system. High interaction with others.

Roaded Natural - Natural appearing with nodes and corridors of development such as campgrounds, trailheads, boat launches, and small scale resorts. Moderate evidence of human sights and sounds. Classified road system for highway vehicle use.

Semi-Primitive Motorized - Predominately natural, with motorized travel allowed. Moderate probability of solitude and closeness to nature. Limited facilities, low to moderate frequency of contact with others.

Reference Features

-  Interstate
-  Highways
-  Major Roads
-  Railroad
-  Stream/Wash
-  County Boundary
-  Indian Community Boundary
-  Sonoran Desert National Monument

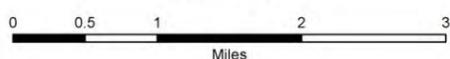
Project Location



Sources

Bureau of Land Management, Arizona State Office, 2014
 USGS, 2015
 ESRI Street Map, 2013
 Pinal County, 2015

December 10, 2015



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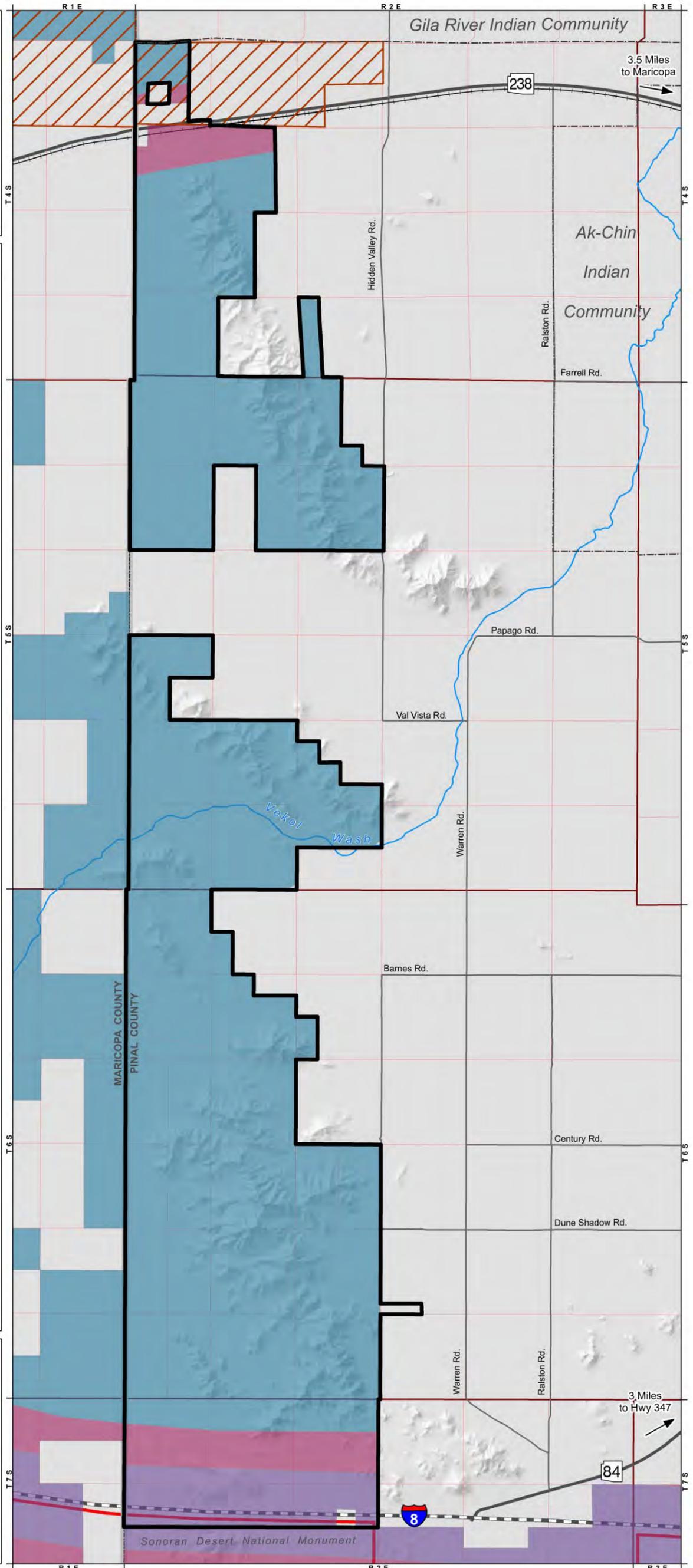


Figure 4-11 BLM Recreation

Palo Verde Regional Park

BLM Route Inventory



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wide open opportunity

Project Features

- Proposed Regional Park Boundary

Resource Features

BLM Route Inventory

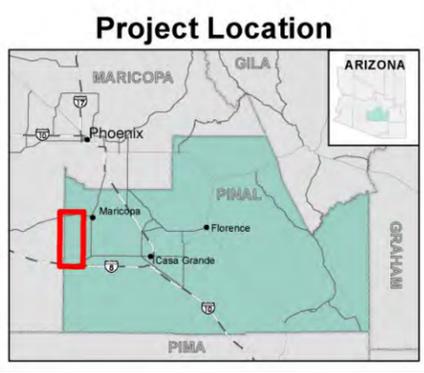
- Primary Road (Unpaved)
- Secondary Road (Paved)
- Tertiary Road (Unpaved)
- Reclaiming

Pinal County

- Proposed Recreation Trail
- Western Pinal County Open Space Initiative Group Recreation Trail

Reference Features

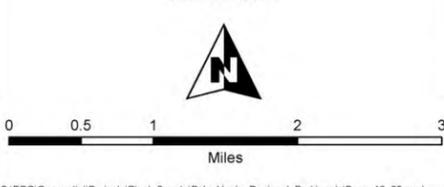
- Interstate
- Highways
- Major Roads
- Railroad
- Stream/Wash
- County Boundary
- Indian Community Boundary
- Sonoran Desert National Monument
- Lower Gila Terraces and Historic Trails ACEC



Sources

Bureau of Land Management, Arizona State Office, 2014
USGS, 2015
ESRI Street Map, 2013
Pinal County, 2015

December 10, 2015



0 0.5 1 2 3
Miles

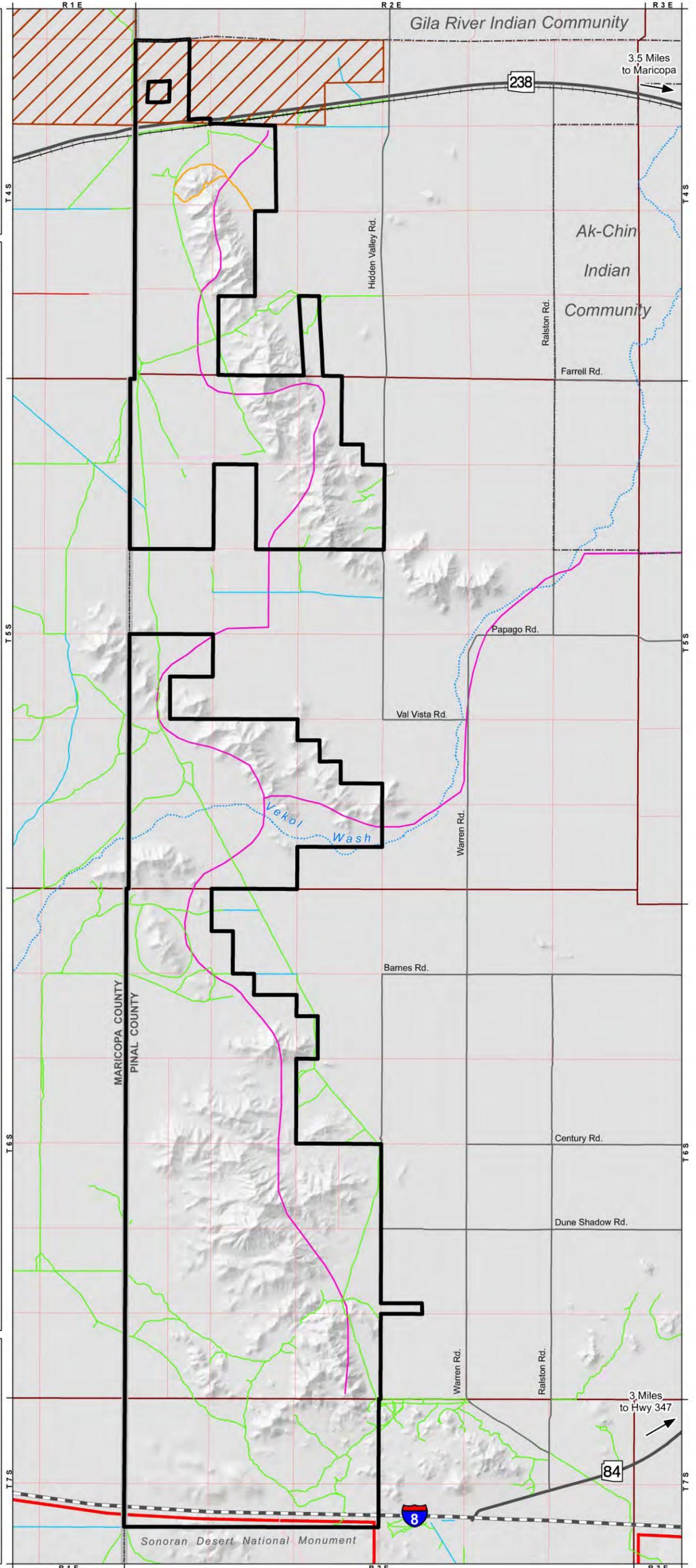


Figure 4-12 BLM Routes

Palo Verde Regional Park

Recreation Facilities



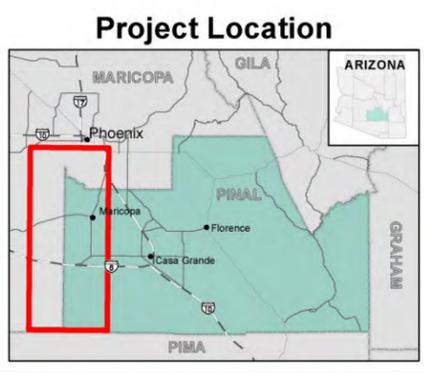
Project Features

- Proposed Regional Park Boundary

Resource Features

- #### Existing Recreation Facilities
- Aeronautical
 - Aquatics
 - Campground
 - Equestrian
 - Fishing
 - Golf
 - Lodging
 - Museum
 - Open Space
 - Proposed Motocross Track

- #### Reference Features
- City/Town
 - Interstate
 - Highways
 - Major Roads
 - Railroad
 - Stream/Wash
 - County Boundary
 - Sonoran Desert National Monument
 - Lower Gila Terraces and Historic Trails ACEC
 - Project Location 10 mile Buffer



Sources

Bureau of Land Management, Arizona State Office, 2014
 USGS, 2015
 ESRI Street Map, 2013
 Pinal County, 2015

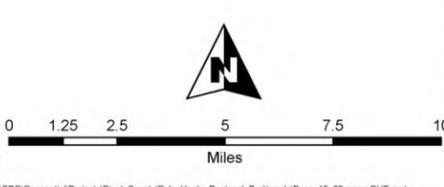
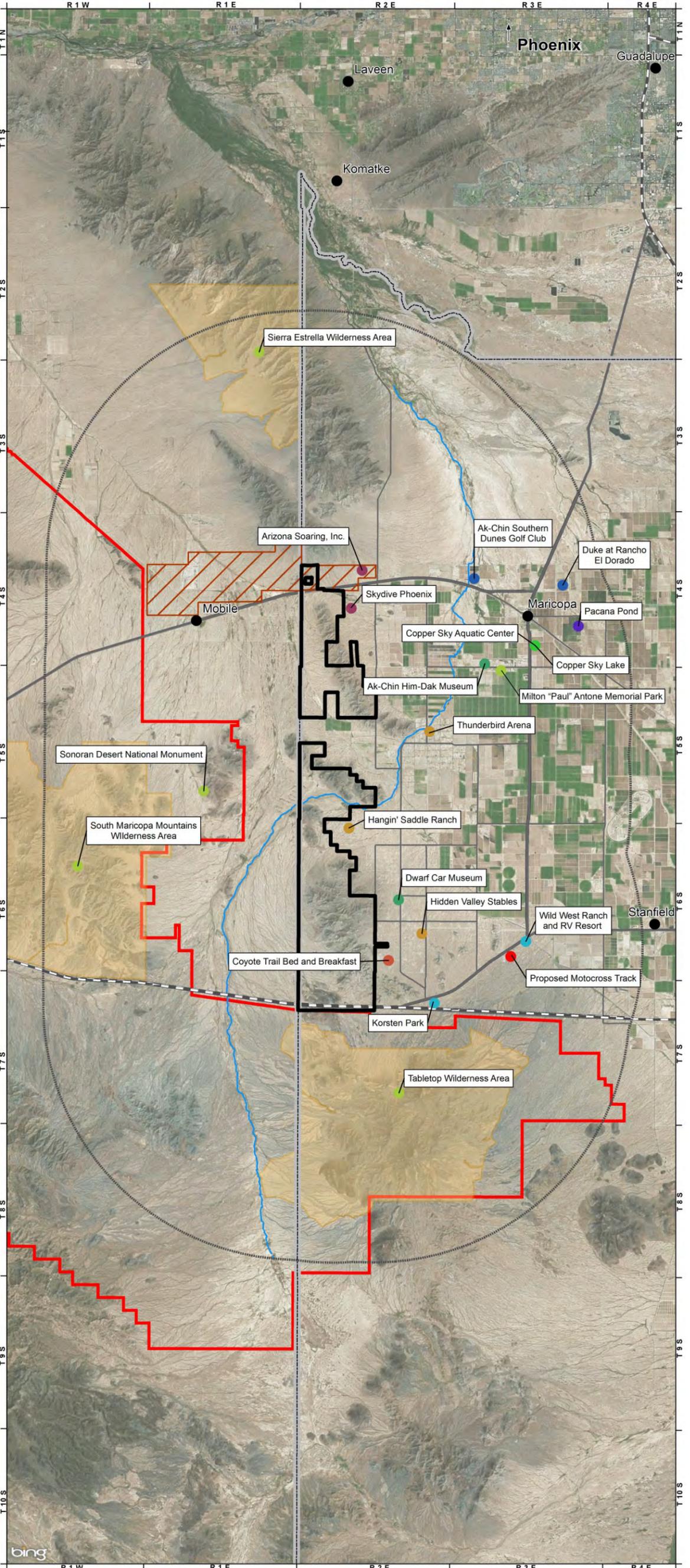



Figure 4-13 Recreation Facilities

Palo Verde Regional Park

MAG Regional Transportation Plan



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Project Features

 Proposed Regional Park Boundary

Resource Features

Maricopa Association of Governments Hidden Valley Illustrative Corridors

-  Illustrative Freeways/Improvements
-  Illustrative Parkways; Scenic Parkway

Pinal County Rights of Way

-  ROW - County/State/Public

Reference Features

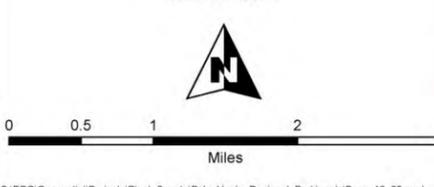
-  Interstate
-  Highways
-  Major Roads
-  Roads
-  Other Roads
-  Railroad
-  Stream/Wash
-  County Boundary
-  Indian Community Boundary
-  Sonoran Desert National Monument
-  Lower Gila Terraces and Historic Trails ACEC



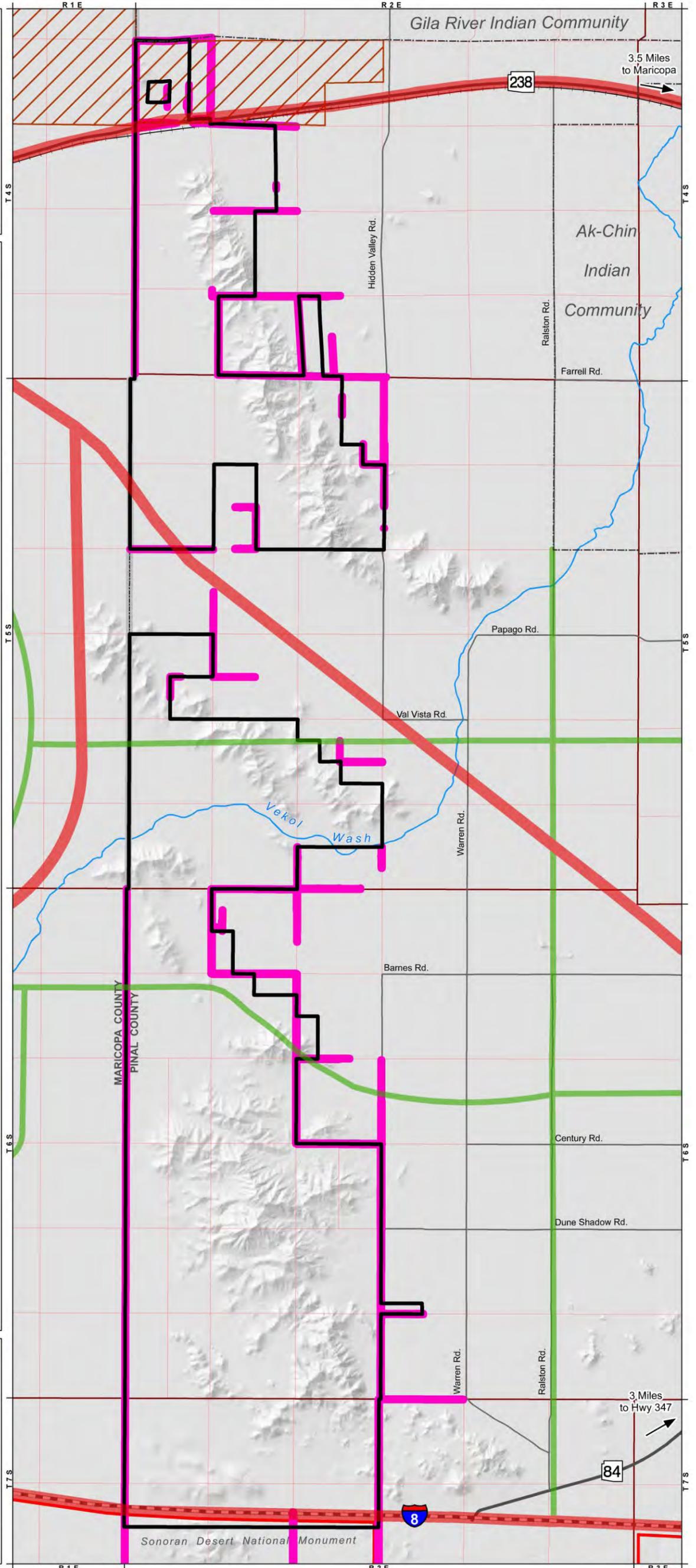
Sources

Bureau of Land Management, Arizona State Office, 2014
 USGS, 2015
 ESRI Street Map, 2013
 Pinal County, 2015
 Maricopa Association of Governments, 2015, 2035 Regional Transportation Plan, Fig. 16-3

December 10, 2015



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Palo Verde Regional Park

Utilities



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wide open opportunity

Project Features

- Proposed Regional Park Boundary

Resource Features

- #### Transmission Lines
- 230 kV
 - 345 kV
 - 500 kV
- #### Other Utilities
- Substation
 - Pipeline
 - Utility Corridor (BLM)
 - Utility-scale Renewable Energy Development Avoidance Area (BLM)

Reference Features

- Interstate
- Highways
- Major Roads
- Railroad
- Stream/Wash
- County Boundary
- Indian Community Boundary
- Sonoran Desert National Monument
- Lower Gila Terraces and Historic Trails ACEC



Sources

Bureau of Land Management, Arizona State Office, 2014
 USGS, 2015
 ESRI Street Map, 2013
 Pinal County, 2015

December 10, 2015

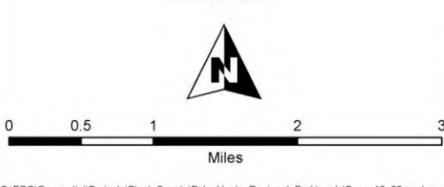
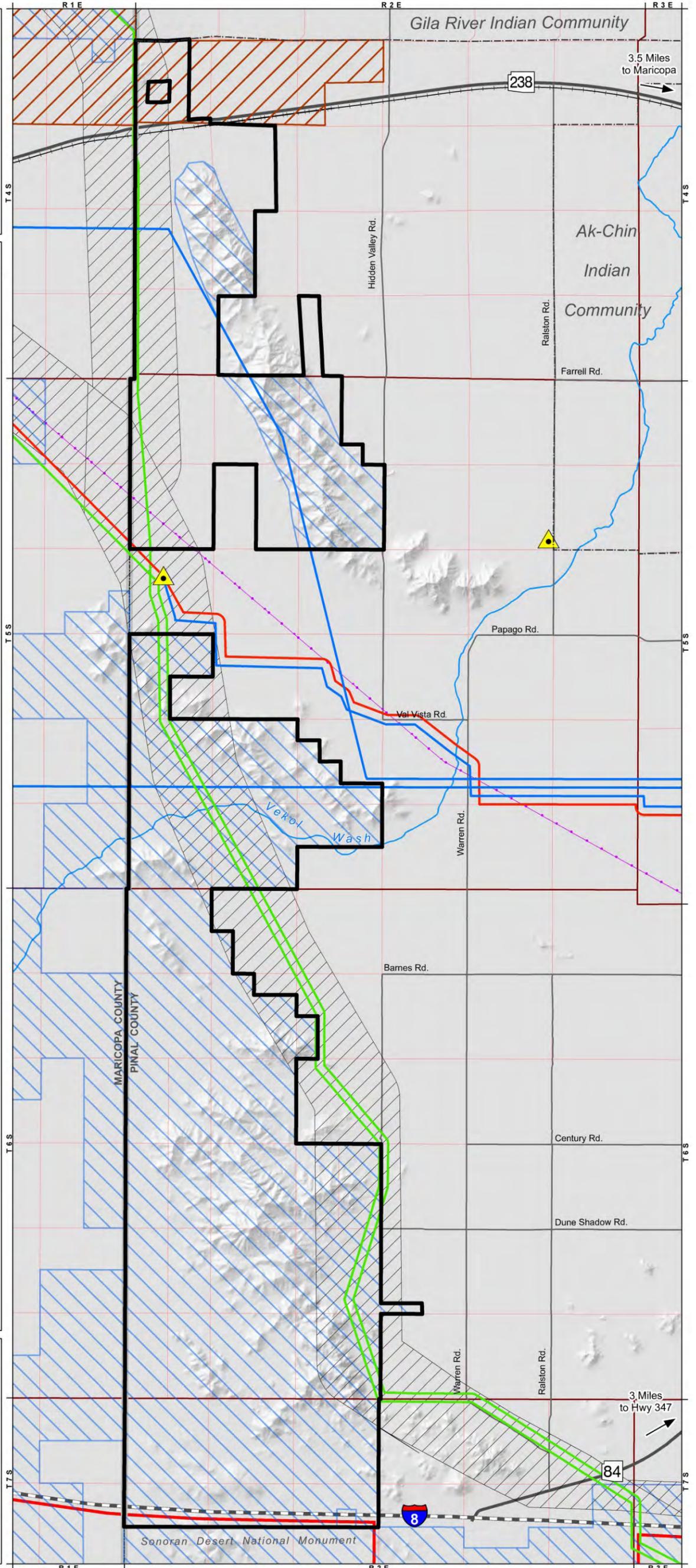



Figure 4-15 Utilities

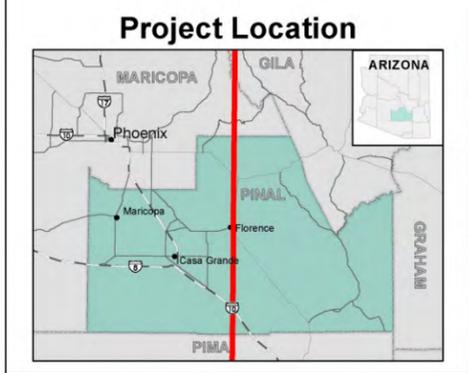
Palo Verde Regional Park

Drive Time Analysis



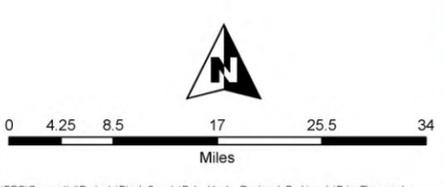
PINAL COUNTY
wide open opportunity

- Project Features**
- Proposed Regional Park Boundary
- Resource Features**
- Drive Times**
- 15 Minutes
 - 30 Minutes
 - 45 Minutes
- Reference Features**
- City/Town
 - Interstate
 - Highways
 - Major Roads
 - Railroad
 - Stream/Wash
 - County Boundary
 - Sonoran Desert National Monument
 - Lower Gila Terraces and Historic Trails ACEC



Sources

Bureau of Land Management, Arizona State Office, 2014
 USGS, 2015
 ESRI Street Map, 2013
 Pinal County, 2015



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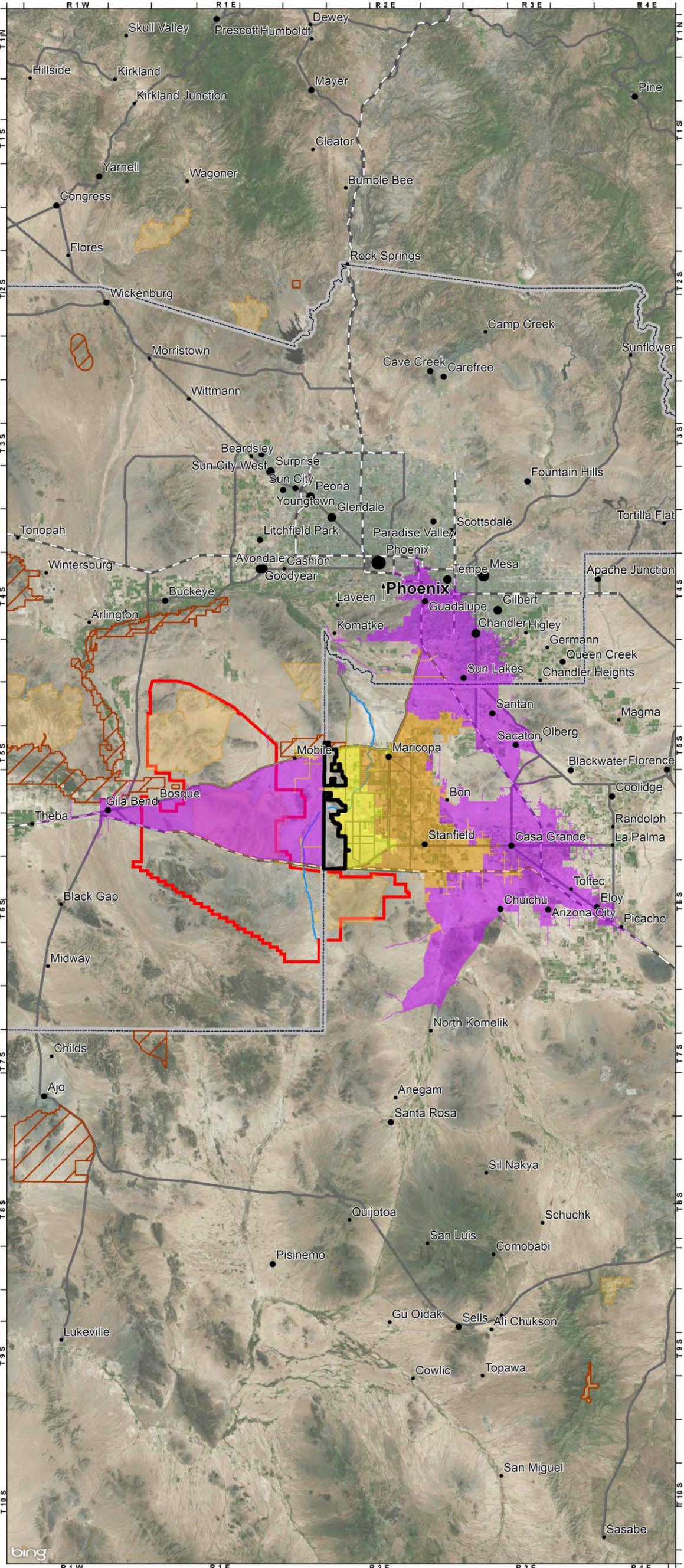


Figure 4-16 Drive Time Analysis

Palo Verde Regional Park

Site Analysis



Project Features

- Proposed Regional Park Boundary

Resource Features

BLM Route Inventory

- Primary Road (Unpaved)
- Secondary Road (Paved)
- Tertiary Road (Unpaved)
- Reclaiming

Pinal County

- Proposed Recreation Trail
- Western Pinal County Open Space Initiative Group Recreation Trail
- ROW - County/State/Public

FEMA Flood Zones

- A

BLM Visual Resource Management

- Class II
- Class III
- Class IV

Slope (%)

- 5-10%
- 10-20%
- >20%

Land Ownership

- State Trust Land
- Indian Reservation
- Bureau of Land Management
- Private/Other

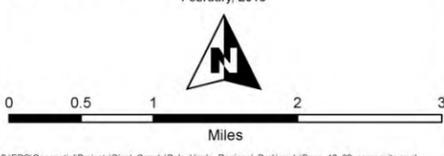
Reference Features

- Interstate
- Highways
- Major Roads
- Railroad
- Stream/Wash
- County Boundary
- Indian Community Boundary
- Sonoran Desert National Monument
- Lower Gila Terraces and Historic Trails ACEC

Sources

- Bureau of Land Management, Arizona State Office, 2014
- USGS, 2015
- ESRI Street Map, 2013
- Pinal County, 2015

February, 2016



0 0.5 1 2 3 Miles

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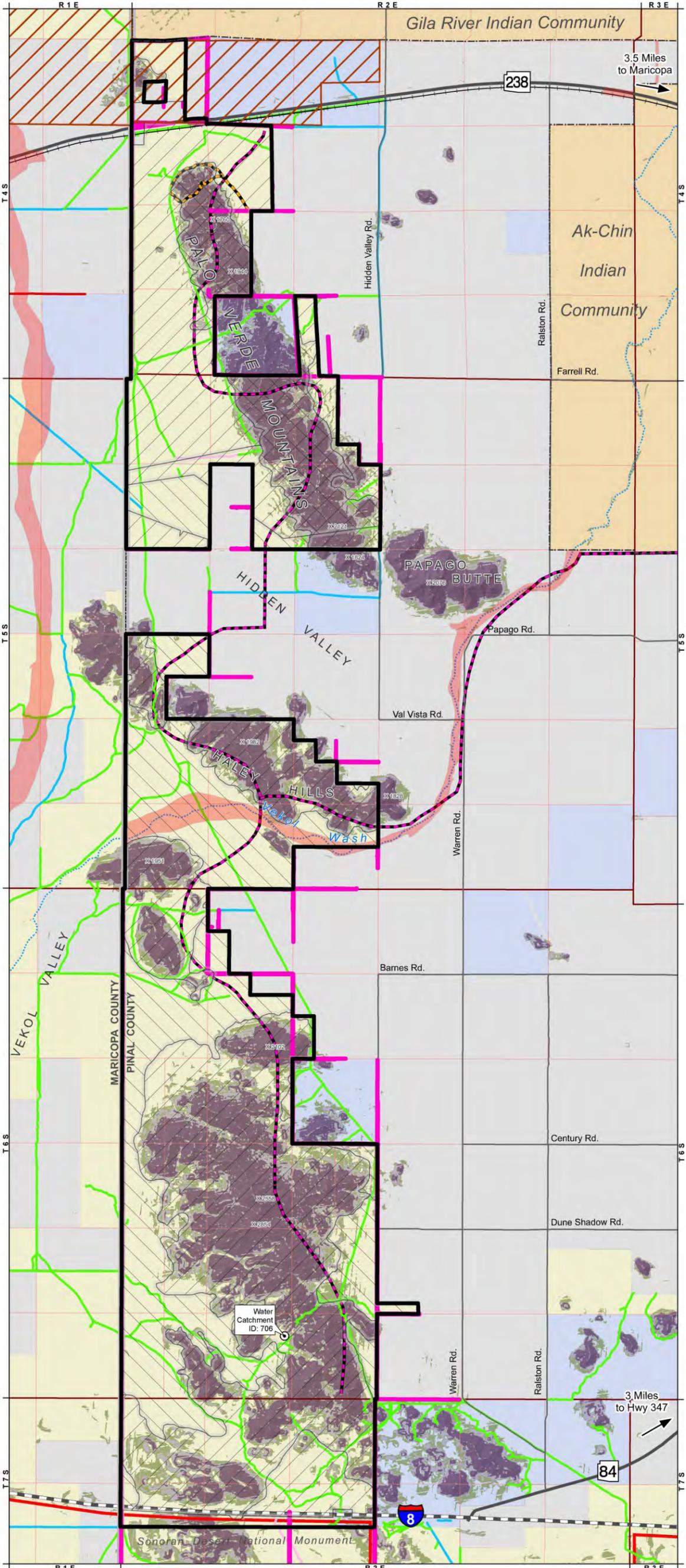


Figure 4-17 Site Analysis

Section 5 – RECREATION NEEDS ASSESSMENT

Although there is an abundance of open spaces and public lands across Pinal County that could attract seasonal and year-round visitors, there are a very limited number of developed municipal and county recreation facilities. Disproportionate to its population, Pinal County provides very few recreation facilities, which was recognized in the Open Spaces and Places element of the *We Create Our Future, Pinal County Comprehensive Plan*. Existing facilities include the 5-acre Oracle Park, a neighborhood park in unincorporated Oracle; the 10-acre Dudleyville Park, a neighborhood park in unincorporated Dudleyville; and the 160-acre West Pinal Kortsen Park, a community park near Stanfield. Opportunities at these parks are limited to picnicking, small playgrounds, a softball field, basketball courts, a few short trails, and unimproved camping. In cooperation with other agencies and groups, Pinal County provides hiking opportunities at the Arizona National Scenic Trail and Lost Goldmine Trail. Although located in Pinal County, San Tan Mountain Regional Park near Queen Creek is operated by the Maricopa County Parks and Recreation Department. Around and within the Arizona Sun Corridor, the megapolitan area that stretches from beyond Phoenix and Tucson, there are several National Park Service units, national forests, Arizona State Parks units, Maricopa County and Pima County parks, AST lands (with recreational permit or valid hunting license), and private recreational resources, such as zoos and water parks. As recently as 2011, it was documented that these resources and opportunities, and others statewide, are key to 87,000 jobs, \$371 million in tax revenues, and \$5.3 billion annually in retail sales and services across Arizona for “human-powered recreation” alone (Bavousett, Brigitte and Gerald D. O’Neill, Jr., 2011).

As reported in the *Pinal County Open Space and Trails Master Plan*, “the Sonoran Desert, according to the World Wildlife fund, has the greatest diversity of vegetative growth of any desert in the world. It is home to 560 plant species, 58 reptile species, and 41 percent of all terrestrial bird species found in the United States. Large areas of pristine Sonoran Desert exist in and throughout Pinal County, and with rapid urbanization the need to preserve large tracts of unfragmented desert becomes increasingly more important.”

The SCORP established that there is a need for more park space in Pinal County. The SCORP conducted a survey of Pinal County residents. Some of its findings include:

- Approximately 60 percent of the households in Pinal County say they visited a park or recreation area an average of four times in the past three months, which equates to 431,345 visits
- Thirty-seven percent say they travel more than 50 miles to get to the park they visit most often, 26 percent travel 6-50 miles, 28 percent travel 1-5 miles, and 9 percent travel less than 2 miles
- Fifty-one percent say they would go more often if the park were closer

In support of the SCORP findings, the residents of the county were asked to rate their preference for types of parks to receive funding. Forty percent of the respondents preferred funding to be directed toward large nature-oriented parks, 27 percent toward open space, 18 percent toward neighborhood parks, and 15 percent toward multi-use parks. Public comments from stakeholders and public meetings throughout the [OS&T Master] Plan preparation process reinforced these findings with additional emphasis placed on special use areas, such as equestrian facilities and OHV areas (Logan Simpson Design, Inc. 2007).

With the recent adoption of the OS&T Master Plan, Pinal County has recognized the gaps in service to the recreating public. As such, it is in the beginning stages of providing recreational opportunities on a regional scale. In addition to the proposed CRMA, Pinal County is in the planning phases for Peralta Regional Park, Tortolita Mountain Regional Park, and the CAP Recreation Trail. Addressing the public demand documented in the SCORP and OS&T Master Plan, these facilities are located broadly across the county, which will provide nearby recreation opportunities to a larger portion of county residents and visitors. The proposed CRMA would not only provide area residents and visitors close access to a Pinal County park, but would allow the Open Space and Trails Department to:

- Address growing recreation demand in western Pinal County and provide the visiting public with on-site amenities
- With the BLM, provide oversight and protection of the natural resources of the Sonoran Desert within the CRMA
- With the BLM, mitigate and restore damaged areas caused by unauthorized and illegal recreation activities, which are a growing occurrence and observable problem

5.1 Recreation Activity Evaluation



The purpose of the RAE was to obtain input from the stakeholders and public regarding the needs and/or desires for recreation uses, facilities, and amenities in the CRMA. Public input was gathered during Public Meeting #1 along with input from the Working Group. Additional information was obtained through the project website. Comments and issues gathered during this process were also reviewed, evaluated, and summarized in relation to alternatives. The RAE results are illustrated in Figure 5-1.

As part of this task, municipal and private recreation facilities within a 5-mile buffer area of the CRMA were inventoried to determine service area voids and opportunities, Figure-X. Also, operational and maintenance needs and concerns were discussed with Pinal County staff regarding different potential uses. Within the 5-mile buffer area, depending on the recreation activity or facility, there are few to no competing private operations for the activities anticipated in the CRMA.

The RAE results are qualitative based on a rating from low to high, and consider recreation activity in comparison to criteria such as: compliance with Pinal County policy, whether the activity supports the CRMA goals, level of public interest, level of public opposition, regional availability, potential site disturbance, infrastructure requirements, operation and maintenance requirements, and potential for revenue generation. Based on the evaluation, recreation activities were recommended for consideration or elimination from the concept alternatives, and presented to the public for review. In general, public comments indicated a desire to leave the park as largely undeveloped with proposed facilities to include trailheads, restrooms, non-motorized trails, a campground, and similar rural park facilities. OHV use in the CRMA was also a popular activity that was desired to be

continued. Many comments noted that the park should not be overdeveloped with intensive active recreation facilities that require extensive infrastructure. Further analysis of site specific location, resource suitability, SAG, and public comments, along with operational and management considerations, helped to refine the recreation activities considered in the preferred alternative.

In general, the basis for determining the results of the RAE came from existing secondary data and information provided by the Pinal County, SAG, and the professional experience of the planning consultants. Additional information was obtained from the public via the open house meetings and project webpage comments. The results of the RAE are the basis for the recreational activities and facilities proposed in the alternatives, which are presented in Chapter 6 - Cooperative Recreation Management Area Master Plan.

5.2 Revenue Activities

A characteristic of a regional, state, or federal park system is that, to the extent possible, it often functions as a non-profit business enterprise. In order to provide basic services to the public, perform maintenance, and staff its operations, it strives to operate on revenues that it collects in the form of park entry, camping, special use fees, and a percentage of concessionaire revenues. The rationale behind recreation fees and other types of use fees is that those who use particular services and facilities should pay for a larger portion of the costs, rather than require other taxpayers who never use the amenities to pay the entire cost. Specific use fee categories for standard amenities, expanded amenities, and special recreation permits will be a future policy decision by the Board of Supervisors and will be defined in the CMA between Pinal County and the BLM. Charged fees will be commensurate with the benefits and services provided to CRMA visitors and in keeping with a use fee schedule as it may be revised from time to time.

Fees allowed for recreation on federal lands is outlined by statute. In accordance with the Federal Lands Recreation Enhancement Act (REA), use fees in the CRMA will be limited to facilities that have a specified minimum level of development and meet specific criteria. As prescribed by law, the majority of fee revenues must be retained for the benefit of the CRMA and used to enhance visitor services, including repair, maintenance, and facility enhancement. Typical utilization of fee revenues include habitat restoration, maintaining

The **Federal Lands Recreation Enhancement Act** of 2004 (PL 108-447, 16 USC Chapter 87 § 6801 et. seq.) allows for fees to be charged for recreational use of public lands managed by the BLM and other agencies. Between 1995 and 2005, recreation demand increased approximately 65 percent on BLM lands. The Recreation Fee Program is a program by which fees paid by visitors to certain recreation sites are retained by the collecting site and used to improve the quality of the visitor experiences at those sites. The Act provides agencies with recreation fee authority, which will allow the agencies to improve the efficiency of the program, provide better facilities and services to the visitors, employ greater use of technology, and enter into more fee management agreements with counties and other entities to provide additional services to visitors.

Recreation fees are not new. Some recreation fees date back to 1908, when the Congress first established broad recreation fee authority under the Land and Water Conservation Fund Act. Additionally, recreation on public lands has never been “free.” The care of our public lands is subsidized by tax dollars. One intention of the Recreation Fee Program is to shift some of the cost of benefits and services to those who directly use them.

campgrounds, providing water, providing public toilets, developed parking, trash receptacles, and similar amenities that most visitors might expect. Per the REA, in general, use fees may be charged as follows:

5.2.1 Standard Amenity Recreation Fee

A standard amenity recreation fee will be charged at only the following:

- A destination visitor or interpretive center that provides a broad range of interpretive services, programs, and media
- An area:
 - (a) That provides significant opportunities for outdoor recreation;
 - (b) That has substantial public investments;
 - (c) Where fees can be efficiently collected; and
 - (d) That contains all of the following amenities:
 - (i) Designated developed parking
 - (ii) A permanent toilet facility
 - (iii) A permanent trash receptacle
 - (iv) Interpretive sign, exhibit, or kiosk
 - (v) Picnic tables
 - (vi) Security services

5.2.2 Expanded Amenity Recreation Fee

An expanded amenity recreation fee, either in addition to a standard amenity fee or by itself, will be charged for the following facilities or services:

- Use of developed campgrounds that provide at least a majority of the following:
 - (a) Tent or trailer spaces
 - (b) Picnic tables
 - (c) Drinking water
 - (d) Access roads
 - (e) The collection of the fee by an employee or agent of Pinal County
 - (f) Reasonable visitor protection
 - (g) Refuse containers
 - (h) Toilet facilities
 - (i) Simple devices for containing a campfire
- Rental of cabins, stock animals, lookouts, group day-use or overnight sites, audio tour devices, portable sanitation devices, binoculars, or other equipment
- Use of hookups for electricity, water, or sewer
- Use of sanitary dump stations
- Participation in an enhanced interpretive program or special tour
- Use of reservation services
- Use of transportation services

- Use of areas where emergency medical or first-aid services are administered from facilities staffed by public employees or employees under a contract or reciprocal agreement with Pinal County

5.2.3 Special Recreation Permit Fee

A special recreation permit may be issued, and a special recreation permit fee charged in connection with the issuance of the permit, for specialized recreation uses of the CRMA lands for areas where natural and cultural resources need protection or where extra measures are required for the health and safety of visitors. Permits may be required for group activities, recreation events, shooting ranges, motorized recreational vehicle, specialized trail systems, and similar uses.

5.2.4 Prohibited Fees

In general, the REA prohibits certain fees:

- Solely for parking, undesignated parking, or picnicking along roads or trailsides
- For general access to BLM areas
- For persons who are walking through, horseback riding through, or hiking through CRMA lands where no facilities or services are used.
- For use of overlooks or scenic pullouts
- For any person who is engaged in the conduct of official Federal, State, Tribal, or local government business
- For special attention or extra services necessary to meet the needs of the disabled
- Any person under 16 years of age (entrance or amenity recreation fee)



Palo Verde Regional Park Master Plan
DRAFT Recreation Activity Evaluation

| Facility / Activity | Complies with Pinal County Policy | Determined by Citizens | | Determined by Stakeholders and Planning Team | | | | | | Consider For Master Plan |
|---|-----------------------------------|--------------------------------------|---------------------------|--|-----------------------|----------------------------|----------------------------|--------------------------|-------------------|--------------------------|
| | | Public Interest | Rank by Survey | Public Opposition | Regional Availability | Potential Site Disturbance | Infrastructure Requirement | Operations & Maintenance | Revenue Potential | |
| | | Low Moderate High 435 Respondents | Low Moderate High 1-10 | Low Moderate High | Low Moderate High | Low Moderate High | Low Moderate High | Low Moderate High | Low Moderate High | |
| Trail (Non-motorized for Hiking/Running, Bike, and Equestrian Users) | | | | | | | | | | |
| Secondary Trails (2' Tread) | Yes | 240 | 1 | | | | | | | Yes |
| Primary Trails (4' Tread) | Yes | 201 | 2 | | | | | | | Yes |
| Competitive Tracks (Running, Bike, Equestrian) | Yes | 158 | 3 | | | | | | | Yes |
| Interpretive Trails | Yes | 118 | 10 | | | | | | | Yes |
| Barrier-Free Trails | Yes | 115 | 11 | | | | | | | Yes |
| Trailhead Facility (Parking, Comfort Station) | Yes | 0 | 46 | | | | | | | Yes |
| Trails (Motorized) | | | | | | | | | | |
| Single Track (Motorcycle) | Yes | 146 | 6 | | | | | | | Yes |
| Two Track (Off Highway Vehicle) | Yes | 145 | 7 | | | | | | | Yes |
| Jeep Tour | Yes | 65 | 20 | | | | | | | No |
| Staging Area | Yes | 110 | 13 | | | | | | | Yes |
| Passenger Car Loop | Yes | 33 | 34 | | | | | | | No |
| Equestrian | | | | | | | | | | |
| Riding Stable (Equestrian Stalling, Non-Concessionaire) | With Provisions | 45 | 30 | | | | | | | Yes |
| Arena | With Provisions | 51 | 25 | | | | | | | Yes |
| Backcountry Water | Yes | 78 | 16 | | | | | | | Yes |
| Staging Area | With Provisions | 83 | 15 | | | | | | | Yes |
| Interpretive | | | | | | | | | | |
| Interpretive Center | Yes | 17 | 43 | | | | | | | Yes |
| Nature Center | Yes | 48 | 26 | | | | | | | Yes |
| Museum/Cultural Center | Yes | 19 | 41 | | | | | | | Yes |
| Botanical Garden | Yes | 41 | 31 | | | | | | | No |
| Amphitheater (Small, Up to 100 People) | Yes | 17 | 44 | | | | | | | Yes |
| Wildlife Viewing/Bird Watching | Yes | 34 | 32 | | | | | | | Yes |
| Photography | Yes | 26 | 38 | | | | | | | Yes |
| Picnic Area | | | | | | | | | | |
| Family Area | Yes | 147 | 5 | | | | | | | Yes |
| Large Group | Yes | 57 | 23 | | | | | | | Yes |
| Playground | Yes | 42 | 30 | | | | | | | Yes |
| Camping | | | | | | | | | | |
| Backcountry | Yes | 137 | 8 | | | | | | | Yes |
| Tent Site | Yes | 154 | 4 | | | | | | | Yes |
| RV/Trailer Camping (Unimproved) | Yes | 113 | 12 | | | | | | | Yes |
| RV/Trailer Site (Electric, Water) | Yes | 98 | 14 | | | | | | | Yes |
| Group Site | Yes | 60 | 22 | | | | | | | Yes |
| Shooting Sports | | | | | | | | | | |
| Shooting Range (Pistol & Rifle) | With Provisions | 119 | 9 | | | | | | | Yes |
| Shotgun (Skeet/Trap/Sporting Clays) | With Provisions | 68 | 18 | | | | | | | Yes |
| Archery Range | With Provisions | 47 | 27 | | | | | | | Yes |
| Archery Field Course | With Provisions | 34 | 33 | | | | | | | Yes |
| Paintball Field | With Provisions | 20 | 39 | | | | | | | Yes |
| Shooting Sports Concession | With Provisions | 14 | 45 | | | | | | | Yes |
| Hunting, Backcountry | With Provisions | 32 | 35 | | | | | | | Yes |
| Miscellaneous | | | | | | | | | | |
| Geocaching | With Provisions | 20 | 40 | | | | | | | Yes |
| Rock Climbing | With Provisions | 69 | 17 | | | | | | | Yes |
| Challenge Course (Ropes Course) | With Provisions | 30 | 36 | | | | | | | Yes |
| Zip Line | With Provisions | 46 | 38 | | | | | | | Yes |
| BMX Bike Course | With Provisions | 52 | 24 | | | | | | | Yes |
| BMX Bike Pump Track | With Provisions | 62 | 21 | | | | | | | Yes |
| RC Aircraft Field | With Provisions | 19 | 42 | | | | | | | Yes |
| Large Event Area (Outdoor Theater Performance/Large Amphitheater) | Yes | 27 | 37 | | | | | | | No |
| Off-Leash Dog Area | Yes | 66 | 19 | | | | | | | Yes |
| Other (Written Comments) | | 50 | | | | | | | | |



March 2016

Figure 5-1 Recreation Activity Evaluation

SECTION 6 – COOPERATIVE RECREATION MANAGEMENT AREA MASTER PLAN

6.1 Alternatives

Four alternatives were developed using the data analysis, inventory, recreation needs assessment, and the SAG and initial public meetings. These were presented to the SAG and at Public Meeting #3 for review as part of the planning and public involvement process. The alternatives ranged from Alternative A - No Action to progressively increasing levels of passive and active recreation opportunities and supporting facility development for Alternatives B, C, and D. Additionally, Alternatives B, C, and D proposed options to separate non-motorized and motorized trail uses. All of the alternatives are compatible with the RMP and the OS&T Department's mission and vision. Public review included both public meeting presentations and online access to the public meeting materials at Pinal County's project webpage. Attendees to the meetings provided written input, and online visitors were asked to respond via an online questionnaire. See Chapter 3, Overview of the Master Planning Process, for a discussion of the public involvement process and directions and suggestions given related to the alternatives.

6.1.1 Alternative A - No Action

Alternative A was established as a No Action Alternative, see Figure 6-1, as a base for comparison of the other alternatives. The No Action Alternative reflects authorized conditions that are expected to continue to exist if the CMAR is not adopted. The alternative provides a basis for comparison of the other alternatives, which indicate progressively increasing levels of recreation, development, and oversight by Pinal County and the BLM. It includes land uses and authorized activities that presently occur in the study area. The No Action Alternative does not in any way imply that unauthorized and illegal activities that now occur would be allowed to continue. Additionally, the activities shown in the alternative are contingent on compliance with BLM policies and management practices, which are subject to change. Existing non-motorized trail uses will continue on the BLM authorized single-track and two-track trail network. Although not an exhaustive list, authorized activities that now occur, or that could occur, include non-motorized secondary trails (2' wide tread), motorized single and two-track trails, wildlife viewing/bird watching, photography, backcountry camping, dispersed rifle and shotgun shooting, hunting, geocaching, and rock climbing.

6.1.2 Opportunities Not Considered

During the RAE (see Chapter 5, Recreation Needs Assessment), there were a few opportunities that were considered but were not carried forward to the Alternatives. The following lists these opportunities, as well as the rationale for their elimination from consideration:

- Jeep Tour—not likely to be economically feasible due to the distance to an urban base of operation and minimal route options for the concessionaire to offer
- Passenger Car Loop—impractical and too expensive to build
- Botanical Garden—lack of public interest and not appropriate for the desert setting of the BLM land

Large Event Area (Outdoor Theater Performance/Large Amphitheater)—not likely to be economically feasible due to high infrastructure costs and distance to a population mass.

6.1.3 Opportunities Common to Alternatives B, C, and D

If the creation of a regional park is the desire of the public, and the park is authorized by the Board of Supervisors, it is the intent of Pinal County to provide recreation experiences in the CRMA that are consistent with the RMP and the OS&T Master Plan’s vision to “provide areas of passive and active recreational opportunities, while conserving existing resources, such as natural scenic beauty, view corridors, wildlife habitat, agricultural resources designated at risk, and cultural heritage for the benefit of present and future generations” (Logan Simpson Design, Inc. 2007). To be sensitive to the Sonoran Desert setting of the CRMA, standards for facility development should:

- Fit within the context of the ecological, physical, and cultural settings of the CRMA
- Be generally minimalist in nature
- Harmonize with, or complement, the character of the landscape setting
- Whenever possible, be in close proximity to existing roadways and infrastructure

In the study area, adjacent development, undesignated backcountry access to the BLM land, apparent staging areas, and areas of intense use, such as shooting areas, indicate a tendency and some level of acceptance for where additional facilities could be located and developed. The public has generally gravitated to areas that are easily accessible by roadway for use areas and as access points. These areas offer convenient access to the backcountry or inviting natural and cultural attractions. Additionally, many of the areas have experienced various levels of degradation due to their use and misuse. Ideally, the development of facilities at these locations could provide simultaneous restoration of the area.

Passive core programs include non-motorized and motorized recreation activities that:

- Offer constructive, restorative, and enjoyable physical or human benefits and foster appreciation and understanding of open space and its purpose, such as horseback riding or mountain biking (by individuals or as non-organized activities)
- Are compatible with other passive recreation uses
- Do not significantly impact natural, cultural, scientific, or agricultural values
- Require only minimal visitor facilities and services directly related to safety and minimize passive recreation impacts
- Are non-consumptive uses of the public land, such as constructed facilities and services
- OHV uses that don’t require additional trails (some unnecessary and under used trails may be obliterated and restored to a natural state)

Therefore, more intensive proposed facility development could occur in the following current higher-use locales to a level commensurate with the alternative’s proposed intensity:

- Farrell Road, west of Hidden Valley Road
- Current shooting area off Hidden Valley Road, 1-1/2 miles south of Farrell Road
- Dune Shadow Road, west of Hidden Valley Road

Lesser intensive development, such as staging areas, trailheads, and day-use areas could be sited where access and need would best fit the needs of visitors. Examples include an interpretive day-use

area north of SR 238 and a trailhead on Barnes Road and/or Century Road, west of Hidden Valley Road.

6.1.4 Alternative B - Minimal Change



Alternative B includes minimal and passive core programs to meet the objectives of an open space park, see Figure 6-2. This alternative provides for minimal levels of recreation opportunities that might be found in an open space regional park system. For this alternative, opportunities, in addition to what now occur in the No Action Alternative, include non-motorized primary (4' tread), trailhead facilities, motorized and equestrian staging areas, family picnicking areas, semi-developed camp sites (no water or electric), and group camping. For this alternative, a developed shooting range would replace the dispersed rifle and shotgun shooting,

which would combine target shooting sports at one designated location in the CRMA.

Additionally, a non-motorized zone is designated for the CRMA, which is from immediately north of the east-west trending two-track trail roughly west of Fresno Road to immediately north of Vekol Wash. Users would have a high probability of experiencing solitude, freedom, closeness to nature, and tranquility in the non-motorized zone. For visitors seeking that type of experience in the CRMA, the zone would 1) provide hikers, mountain bikers, and equestrians with a semi-primitive recreation opportunity and 2) provide a separated system of motorized and non-motorized trails.

6.1.5 Alternative C – Moderate Change

Alternative C builds on Alternative B by adding facilities that would benefit users seeking more varied recreation opportunities or services of both passive and active core programs, see Figure 6-3. These include non-motorized competitive tracks, equestrian riding stable and arena, interpretive center, small amphitheater, playground, developed camp sites (with water and electric), a shotgun range (skeet, trap, and sporting clays), archery range and field course, and shooting sports concession.

The non-motorized zone would be the same area and condition as Alternative B.

Active core programs include recreation activities that:

- Entail direct participation in an organized activity or event, such as an equestrian ride or a bicycle race
- Are more consumptive use of the public land, such as campgrounds, visitor centers, and event areas

6.1.6 Alternative D – Most Change

Alternative D continues to build on the previous alternatives by retaining nearly all of the opportunities of Alternatives B and C and adding additional active core programs to the proposed

CRMA, see Figure 6-4. These include non-motorized interpretive and barrier-free trails, large group picnic areas, a paintball field at the target shooting sports facility, challenge course (ropes course), zip line, BMX bike course, BMX bike pump track, RC aircraft field, and an off-leash dog area.

Additionally, motorized uses would be limited to a zone at the southern end of the CRMA, which is from the southern boundary of the CRMA at I-8 to immediately north of the east-west trending two-track trail roughly west of Fresno Road.

6.1.7 Opportunities That Were Eliminated From Consideration

Actions that were considered in Alternatives B, C, and/or D but were not carried forward to the Preferred Alternative include the following, along with rationale for each opportunity's elimination from consideration:

- Jeep tour, passenger car loop, backcountry water, botanical garden, and large event area—removed from consideration as part of the RAE analysis
- Equestrian Arena—inconsistent with the intent of an open space park and would not likely be economically feasible due to other private arenas in the region
- Paintball Field—inconsistent with the intent of preservation of the natural desert setting

6.1.8 Opportunity That Was Added For Consideration

- Disc Golf—can be consistent with a desert setting. During the alternatives review period, there were a few comments from the public regarding this activity. The activity can be planned and installed in a minimalist fashion into most park settings.

6.2 Draft Preferred Alternative

The Draft Preferred Alternative is a mix of various opportunities and management actions discussed during the alternatives review period. It sets the course for recreation opportunities and management in the CRMA into the foreseeable future.

Based on a multi-month review period involving public comments and Pinal County operational and management considerations, the progressing levels of change of the alternatives were analyzed and consolidated into a Draft Preferred Alternative that is a middle ground of the public's wide range of opinions and voting preference for Alternative A, B, C, or D. The Draft Preferred Alternative, see Figure 6-5, most closely represents features of Alternative C – Moderate Change. Most opportunities and actions provided by Alternative C have been carried forward into the Draft Preferred Alternative, including:

- Non-motorized trail uses (hiking, running, and biking, and equestrian)
- Motorized trail uses on authorized trails
- Equestrian facility uses, except for arenas
- Interpretive uses, including an interpretive center, small amphitheater, wildlife viewing and bird watching, and photography
- Family picnic areas and playgrounds
- Camping uses
- Shooting sports, except a paintball field

- Miscellaneous use, including geocaching, rock climbing, and an off-leash dog area. Additionally, disc golf is included as an appropriate miscellaneous activity.

6.2.1 Management Controls

Prior to initiating changes in the CRMA's future direct use regulations, Pinal County and the BLM will ensure that a careful assessment is made of how visitor-use dynamics interrelate with the RAMP. Pinal County will be the on-site recreation manager, providing recreation management throughout the CRMA as guided by the CMA. The BLM will continue to manage traditional permitted land uses, such as mining and grazing leases, should they occur.

Due to an anticipated and ever-increasing recreation use in the CRMA, a major issue discussed during the review period was the issue of direct management controls, including how much would be charged for entry fees, where these would occur, and what would be the public benefit.

The RAMP provides for optimum levels of a variety of visitor uses by offering non-fee areas and fee-regulated areas. Fee-regulated areas will provide direct benefits and facilities for what would otherwise not be provided to the public without the presence of a Pinal County park, such as developed day-use facilities, camping areas, and a shooting facility. The fees charged will be commensurate with a facility entrance and use fee schedule that will be authorized by the Board of Supervisors. Pinal County will apply to lease/patent parcels from the federal government under the R&PP Act, according to BLM policies, for the proposed fee-regulated areas. All fees collected will provide direct benefit to the CRMA. Pinal County will also be responsible for all special use permitting in the CRMA that is of a recreational nature, including both commercial and non-commercial uses.

Non-fee-regulated uses and non-developed access will continue to be allowed to trails that are currently authorized by the BLM, as long as they are in keeping with the goals of the CRMA.

6.2.2 CRMA Entry/Access

The Draft Preferred Alternative indicates locations that could be proposed park access points. Primary park access points would include access to developed day-use areas and campgrounds. Secondary park access points would include access to the CRMA at non-developed areas. The entry/access locations represent approximate locations only. The exact location of the access points will be studied in greater detail that coordinates:

- Appropriate site suitability for access considering topography, setting, etc.
- Connection to an existing public right-of-way or a location that requires minimal additional rights-or-way
- Ease of accessibility for users
- Minimizing impacts to existing neighboring uses

The existing authorized and unplanned BLM trail route network could lead to conflicts as surrounding residential development and recreational use of the CRMA increases. Additionally, the use of the several adjoining AST land parcels as a part of the regional trail network will require the purchase of access rights from Arizona State Land Department through rights-of-way or special land use permits. AST land is not public land. As a matter of management practicality and to avoid legal

conflicts with crossing of private property and AST land, Pinal County will coordinate with BLM for the future planning of a sustainable trails network that is proactive in addressing these concerns as a provision of the CMA. The future trails plan may include the rerouting, closure, and restoration of some trail segments to end existing illegal private property and AST land crossings and to minimize access costs for AST land use.

6.2.3 Law Enforcement

The Pinal County Sheriff's Office (PCSO) has the responsibility for law enforcement services in the recreational areas of Pinal County. Pinal County recognizes that the potential addition of park lands and responsibilities to the park system for the CRMA will have staffing impacts on the PCSO. Law enforcement staffing will be addressed as part of the operational plans developed when the CMA is executed.

6.3 Goals and Actions

A significant long-term goal of the RAMP is to allow and manage the public lands for the types of public recreation use that will not degrade the natural resources of the CRMA. Facility and infrastructure development will aid in directing use and protecting resources from additional impacts as recreational use of the area increases. Some land that currently has other designated uses will be transferred to an exclusive recreation use through the R&PP process for the lease/patent parcels. Some of these typical land uses could include grazing leases and mining, which are administered by the BLM as allowable uses of the public land.

Long-term management goals for both public use and the maintenance of ecological integrity of the CRMA should consider (in no particular order):

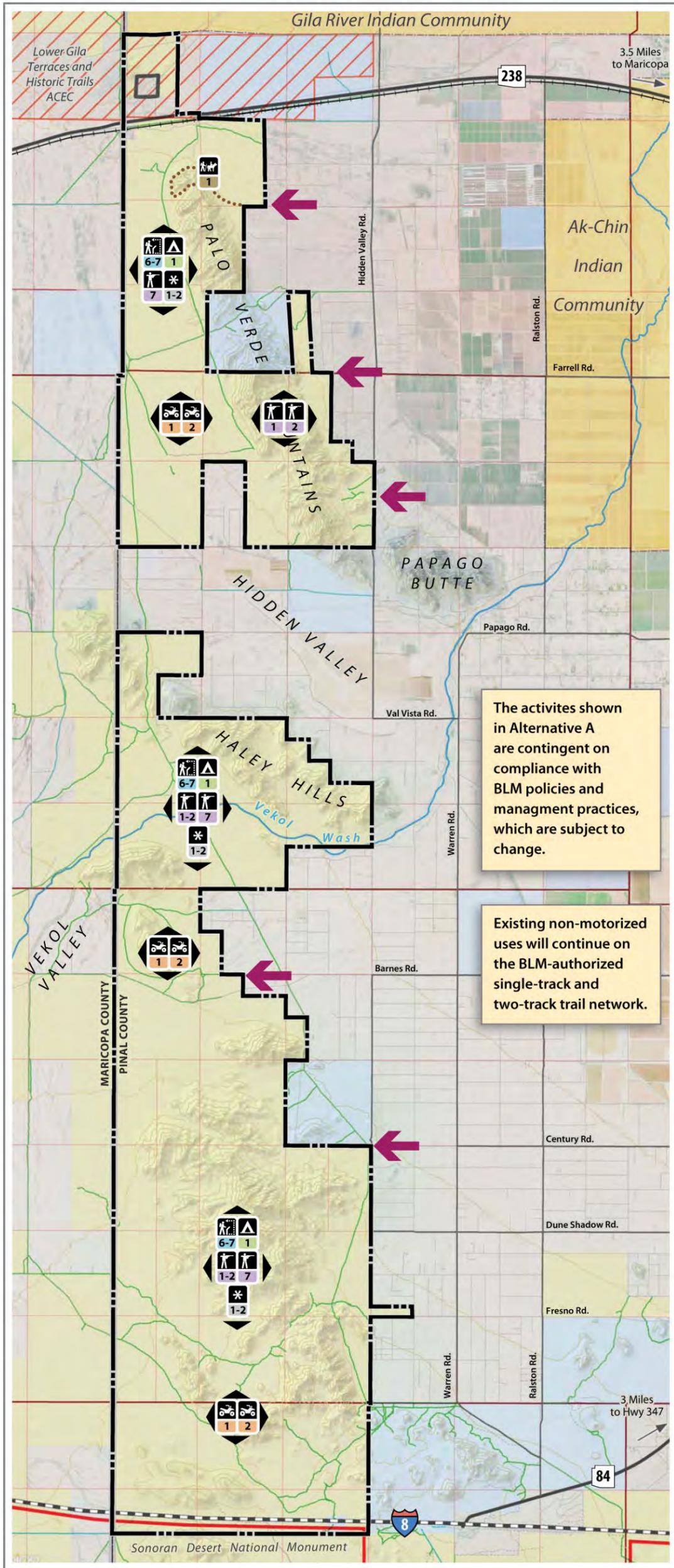
- All use and management of the project area lands must comply with the BLM RMP and other related management plans and actions, such as AGFD regulations.
- Provide for continued wildlife habitat protection and improvement project opportunities. Mitigate conflicts between recreation users and wildlife species to ensure the species' continued existence. Consider wildlife habitat linkages when proposing and siting facility development; mitigate for conflicts.
- Provide for types of sustainable recreational uses of the public lands that do not extensively degrade the natural resources of the CRMA and its ecosystem.
- Protect and restore the natural ecological form, function, and environmental values of the Sonoran Desert.
- Protect and avoid all high vulnerable/low suitability areas as identified in the individual data analysis sections when possible.
- Prior to initiation of detailed planning or design of recreational facilities or improvements, all sites must adhere to applicable federal and state regulations governing the protection of historic or archaeological resources.
- Protect cultural resources from vandalism and development within and immediately adjacent to the CRMA. Build an awareness and appreciation of cultural and natural history resources through interpretation and visitor information.
- Educate the public, particularly younger generations, about the values and benefits of protecting significant natural and cultural resources. Include opportunities for education

about the natural desert and other activities that promote responsible public stewardship by all users, including dark-sky/night-sky viewing.

- Ensure that all facility developments are designed to be visually harmonious with adjacent environs.
- Specific land uses and locations should be responsive to the public land's inherent vulnerability or its ability to withstand the impacts of resource-based recreation.
- Manage the land in the CRMA that is north of Vekol Wash and south of the east-west trending road that is west of Fresno Road, as motorized and non-motorized multi-use. Minimize conflicts between recreation users so that these uses can continue to coexist. Manage the land in the CRMA that is south of Vekol Wash and north of the east-west trending road that is west of Fresno Road for non-motorized uses.
- Minimize natural and human-caused soil erosion and vegetation loss at developed recreation sites and other high-use areas. Incorporate wise soil and vegetation conservation practices into all new development projects.
- Maintain air quality standards throughout the CRMA, adhering to all applicable federal, state, and local regulations governing dust control.
- All proposed uses should be monitored for potential degradation to the CRMA's natural and man-made resources. Once degradation occurs, it is imperative that the intensity of land uses be adjusted or that maintenance of intensively used areas, such as OHV routes, be increased to minimize degradation, so that irreparable damage does not occur. Land uses should be managed, and corresponding levels of intensity should be established, to limit or minimize degradation, to ensure that land health standards are met, and to avoid a decrease in the quality of the user's experience. The result is a RAMP that has a stringent, but adaptable, management plan.

Short-term goals and recommendations need to be extensions of the long-term RAMP goals, especially regarding native flora and fauna and public use. Short-term goals and recommendations include the following (in no particular order):

- Location and construction of the Pinal County Regional Trail through the CRMA.
- Land uses should, whenever possible, serve in managing and preserving the natural ecological functions of the Sonoran Desert. Highly managed or manipulated land uses, such as facility development and trail development, should be kept to a minimum. Facility development should follow good design principles for site location and building materials. Trail development should be in keeping with the BLM travel management plan.
- Existing unauthorized uses will be discontinued immediately. Trail closures and restoration of disturbed areas should restore and maintain a natural physical and biological integrity of the CRMA environs.
- Over time a restoration of other lost environmental values, such as vegetation and wildlife habitat, should also occur.



The activities shown in Alternative A are contingent on compliance with BLM policies and management practices, which are subject to change.

Existing non-motorized uses will continue on the BLM-authorized single-track and two-track trail network.

Palo Verde Regional Park

Alternative A: No Action/Existing Authorized Conditions

PINAL COUNTY
wide open opportunity

Reference Features

- Proposed Park Boundary
- BLM Tertiary Unpaved Road (These are the only BLM-authorized two-track roads)
- National Monument Boundary
- Area of Critical Environmental Concern (ACEC)
- State Trust Land
- Bureau of Land Management
- Pinal County Conceptual Trail Alignment
- Existing Secondary Trail

Proposed Recreation

| Facility/Activity | Complies with County Policy | Consider for Master Plan | Alternatives | | | |
|---|-----------------------------|--------------------------|--------------|-----|-----|-----|
| | | | A | B | C | D |
| Trail (Non-motorized for Hiking/Running, Biking, and Equestrian) | | | | | | |
| 1 Secondary Trails (2' Tread) | Yes | Yes | Yes | Yes | Yes | Yes |
| 2 Primary Trails (4' Tread) | Yes | Yes | No | Yes | Yes | Yes |
| 3 Competitive Tracks (Running, Biking, Equestrian) | Yes | Yes | No | No | Yes | Yes |
| 4 Interpretive Trails | Yes | Yes | No | No | No | Yes |
| 5 Barrier-Free Trails | Yes | Yes | No | No | No | Yes |
| 6 Trailhead Facility (Parking, Comfort Station) | Yes | Yes | No | Yes | Yes | Yes |
| Trails (Motorized) | | | | | | |
| 1 Single Track (Motorcycle) | Yes | Yes | ♦ | ♦ | ♦ | ♦ |
| 2 Two Track (Off-highway Vehicle) | Yes | Yes | ♦ | ♦ | ♦ | ♦ |
| 3 Jeep Tour | Yes | No | No | No | No | No |
| 4 Staging Area | Yes | Yes | No | Yes | Yes | Yes |
| 5 Passenger Car Loop | Yes | No | No | No | No | No |
| Equestrian | | | | | | |
| 1 Riding Stable (Equestrian Stabling, Non-Concessionaire) | ★ | Yes | No | No | Yes | Yes |
| 2 Arena | ★ | Yes | No | No | No | Yes |
| 3 Backcountry Water | Yes | Yes | ○ | ○ | ○ | ○ |
| 4 Staging Area | ★ | Yes | No | Yes | Yes | Yes |
| Interpretive | | | | | | |
| 1 Interpretive Center | Yes | Yes | No | No | Yes | Yes |
| 2 Nature Center | Yes | Yes | No | No | No | Yes |
| 3 Museum/Cultural Center | Yes | Yes | No | No | No | Yes |
| 4 Botanical Garden | Yes | No | No | No | No | No |
| 5 Amphitheater (Small, up to 100 People) | Yes | Yes | No | No | Yes | Yes |
| 6 Wildlife Viewing/Blind Watching | Yes | Yes | Yes | Yes | Yes | Yes |
| 7 Photography | Yes | Yes | Yes | Yes | Yes | Yes |
| Picnic Area | | | | | | |
| 1 Family Area | Yes | Yes | No | Yes | Yes | Yes |
| 2 Large Group | Yes | Yes | No | No | No | Yes |
| 3 Playground | Yes | Yes | No | No | Yes | Yes |
| Camping | | | | | | |
| 1 Backcountry | Yes | Yes | Yes | Yes | Yes | Yes |
| 2 Tent Site | Yes | Yes | No | Yes | Yes | Yes |
| 3 RV/Trailer Camping (Unimproved) | Yes | Yes | No | Yes | Yes | Yes |
| 4 RV/Trailer Site (Electric, Water) | Yes | Yes | No | No | Yes | Yes |
| 5 Group Site | Yes | Yes | No | Yes | Yes | Yes |
| Shooting Sports | | | | | | |
| 1 Shooting Range (Pistol & Rifle) | ★ | Yes | Dispersed | Yes | Yes | Yes |
| 2 Shotgun (Skeet/Trap/Sporting Clays) | ★ | Yes | Dispersed | No | Yes | Yes |
| 3 Archery Range | ★ | Yes | No | No | Yes | Yes |
| 4 Archery Field Course | ★ | Yes | No | No | Yes | Yes |
| 5 Paintball Field | ★ | Yes | No | No | No | Yes |
| 6 Shooting Sports Concession | ★ | Yes | No | No | Yes | Yes |
| 7 Hunting, Backcountry | ★ | Yes | Yes | Yes | Yes | Yes |
| Miscellaneous | | | | | | |
| 1 Geocaching | ★ | Yes | Yes | Yes | Yes | Yes |
| 2 Rock Climbing | ★ | Yes | Yes | Yes | Yes | Yes |
| 3 Challenge Course (Ropes Course) | ★ | Yes | No | No | No | Yes |
| 4 Zip Line | ★ | Yes | No | No | No | Yes |
| 5 BMX Bike Course | ★ | Yes | No | No | No | Yes |
| 6 BMX Bike Pump Track | ★ | Yes | No | No | No | Yes |
| 7 RC Aircraft Field | ★ | Yes | No | No | No | Yes |
| 8 Large Event Area (Outdoor Theater Performance/Large Amphitheater) | Yes | No | No | No | No | No |
| 9 Off-Leash Dog Area | Yes | Yes | No | No | No | Yes |

★ With provisions
 ♦ On authorized trails only
 ○ Natural backcountry water sources already exist within the park

↔ Dispersed Activity Throughout
← Primary Access

June 2016

Figure 6-1 Palo Verde Alternative A

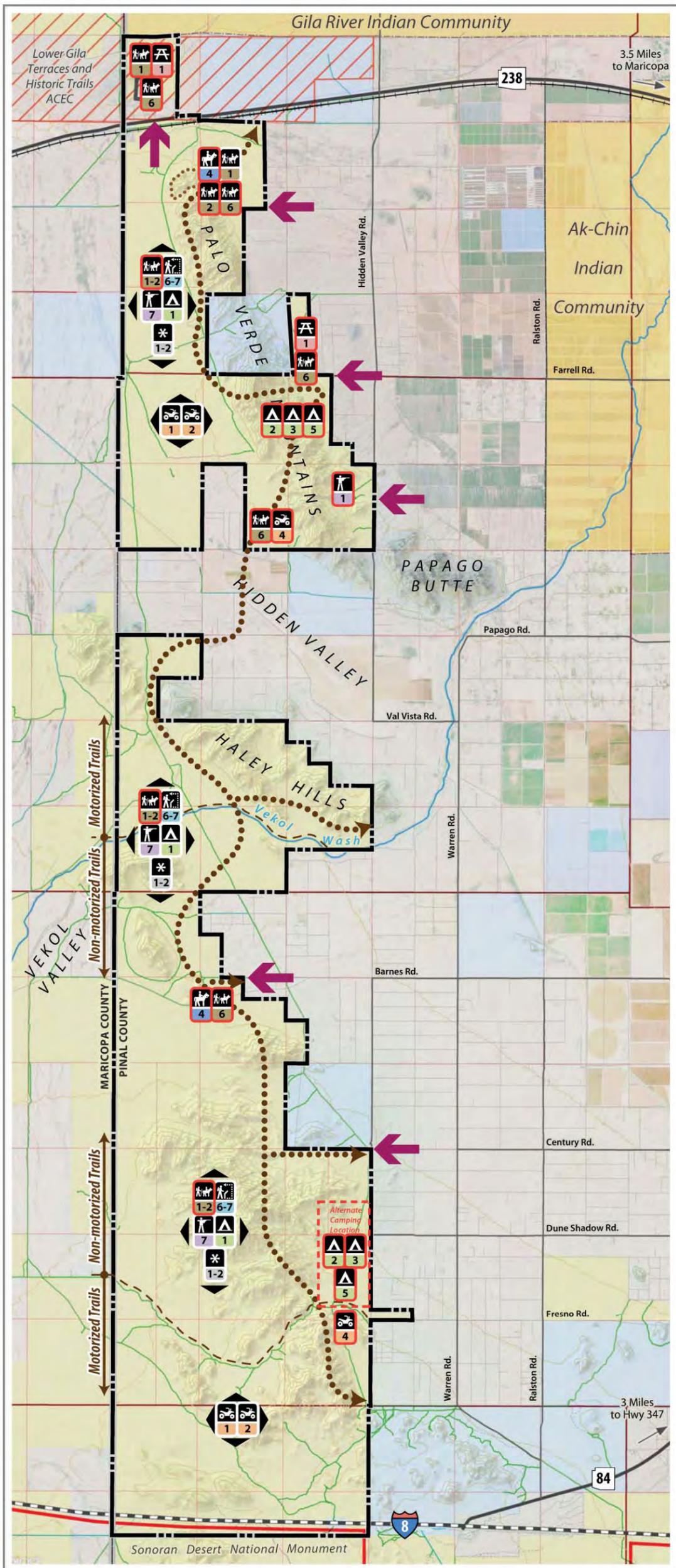


Figure 6-2 Palo Verde Alternative B

Palo Verde Regional Park

Alternative B: Minimal Change



PINAL COUNTY
wide open opportunity

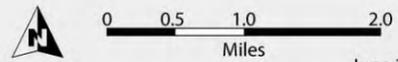
Reference Features

- Proposed Park Boundary
- BLM Tertiary Unpaved Road (These are the only BLM-authorized two-track roads)
- National Monument Boundary
- Area of Critical Environmental Concern (ACEC)
- State Trust Land
- Bureau of Land Management
- Pinal County Conceptual Trail Alignment
- Existing Secondary Trail

Proposed Recreation

| Facility/Activity | Complies with County Policy | Consider for Master Plan | Alternatives | | | |
|---|-----------------------------|--------------------------|--------------|-----|-----|-----|
| | | | A | B | C | D |
| Trail (Non-motorized for Hiking/Running, Biking, and Equestrian) | | | | | | |
| 1 Secondary Trails (2' Tread) | Yes | Yes | Yes | Yes | Yes | Yes |
| 2 Primary Trails (4' Tread) | Yes | Yes | No | Yes | Yes | Yes |
| 3 Competitive Tracks (Running, Biking, Equestrian) | Yes | Yes | No | No | Yes | Yes |
| 4 Interpretive Trails | Yes | Yes | No | No | No | Yes |
| 5 Barrier-Free Trails | Yes | Yes | No | No | No | Yes |
| 6 Trailhead Facility (Parking, Comfort Station) | Yes | Yes | No | Yes | Yes | Yes |
| Trails (Motorized) | | | | | | |
| 1 Single Track (Motorcycle) | Yes | Yes | + | + | + | + |
| 2 Two Track (Off-highway Vehicle) | Yes | Yes | + | + | + | + |
| 3 Jeep Tour | Yes | No | No | No | No | No |
| 4 Staging Area | Yes | Yes | No | Yes | Yes | Yes |
| 5 Passenger Car Loop | Yes | No | No | No | No | No |
| Equestrian | | | | | | |
| 1 Riding Stable (Equestrian Stalling, Non-Concessionaire) | * | Yes | No | No | Yes | Yes |
| 2 Arena | * | Yes | No | No | Yes | Yes |
| 3 Backcountry Water | Yes | Yes | o | o | o | o |
| 4 Staging Area | * | Yes | No | Yes | Yes | Yes |
| Interpretive | | | | | | |
| 1 Interpretive Center | Yes | Yes | No | No | Yes | Yes |
| 2 Nature Center | Yes | Yes | No | No | No | Yes |
| 3 Museum/Cultural Center | Yes | Yes | No | No | No | Yes |
| 4 Botanical Garden | Yes | No | No | No | No | No |
| 5 Amphitheater (Small, up to 100 People) | Yes | Yes | No | No | Yes | Yes |
| 6 Wildlife Viewing/Bird Watching | Yes | Yes | Yes | Yes | Yes | Yes |
| 7 Photography | Yes | Yes | Yes | Yes | Yes | Yes |
| Picnic Area | | | | | | |
| 1 Family Area | Yes | Yes | No | Yes | Yes | Yes |
| 2 Large Group | Yes | Yes | No | No | No | Yes |
| 3 Playground | Yes | Yes | No | No | Yes | Yes |
| Camping | | | | | | |
| 1 Backcountry | Yes | Yes | Yes | Yes | Yes | Yes |
| 2 Tent Site | Yes | Yes | No | Yes | Yes | Yes |
| 3 RV/Trailer Camping (Unimproved) | Yes | Yes | No | Yes | Yes | Yes |
| 4 RV/Trailer Site (Electric, Water) | Yes | Yes | No | No | Yes | Yes |
| 5 Group Site | Yes | Yes | No | Yes | Yes | Yes |
| Shooting Sports | | | | | | |
| 1 Shooting Range (Pistol & Rifle) | * | Yes | Dispersed | Yes | Yes | Yes |
| 2 Shotgun (Skeet/Trap/Sporting Clays) | * | Yes | Dispersed | No | Yes | Yes |
| 3 Archery Range | * | Yes | No | No | Yes | Yes |
| 4 Archery Field Course | * | Yes | No | No | Yes | Yes |
| 5 Paintball Field | * | Yes | No | No | No | Yes |
| 6 Shooting Sports Concession | * | Yes | No | No | Yes | Yes |
| 7 Hunting, Backcountry | * | Yes | Yes | Yes | Yes | Yes |
| Miscellaneous | | | | | | |
| 1 Geocaching | * | Yes | Yes | Yes | Yes | Yes |
| 2 Rock Climbing | * | Yes | Yes | Yes | Yes | Yes |
| 3 Challenge Course (Ropes Course) | * | Yes | No | No | No | Yes |
| 4 Zip Line | * | Yes | No | No | No | Yes |
| 5 BMX Bike Course | * | Yes | No | No | No | Yes |
| 6 BMX Bike Pump Track | * | Yes | No | No | No | Yes |
| 7 RC Aircraft Field | * | Yes | No | No | No | Yes |
| 8 Large Event Area (Outdoor Theater Performance/Large Amphitheater) | Yes | No | No | No | No | No |
| 9 Off-Leash Dog Area | Yes | Yes | No | No | No | Yes |

- * With provisions
- o On authorized trails only
- o Natural backcountry water sources already exist within the park
- Dispersed Activity Throughout
- Proposed Park Access
- Red Outline Indicates Added Activity in this Alternative



June 2016

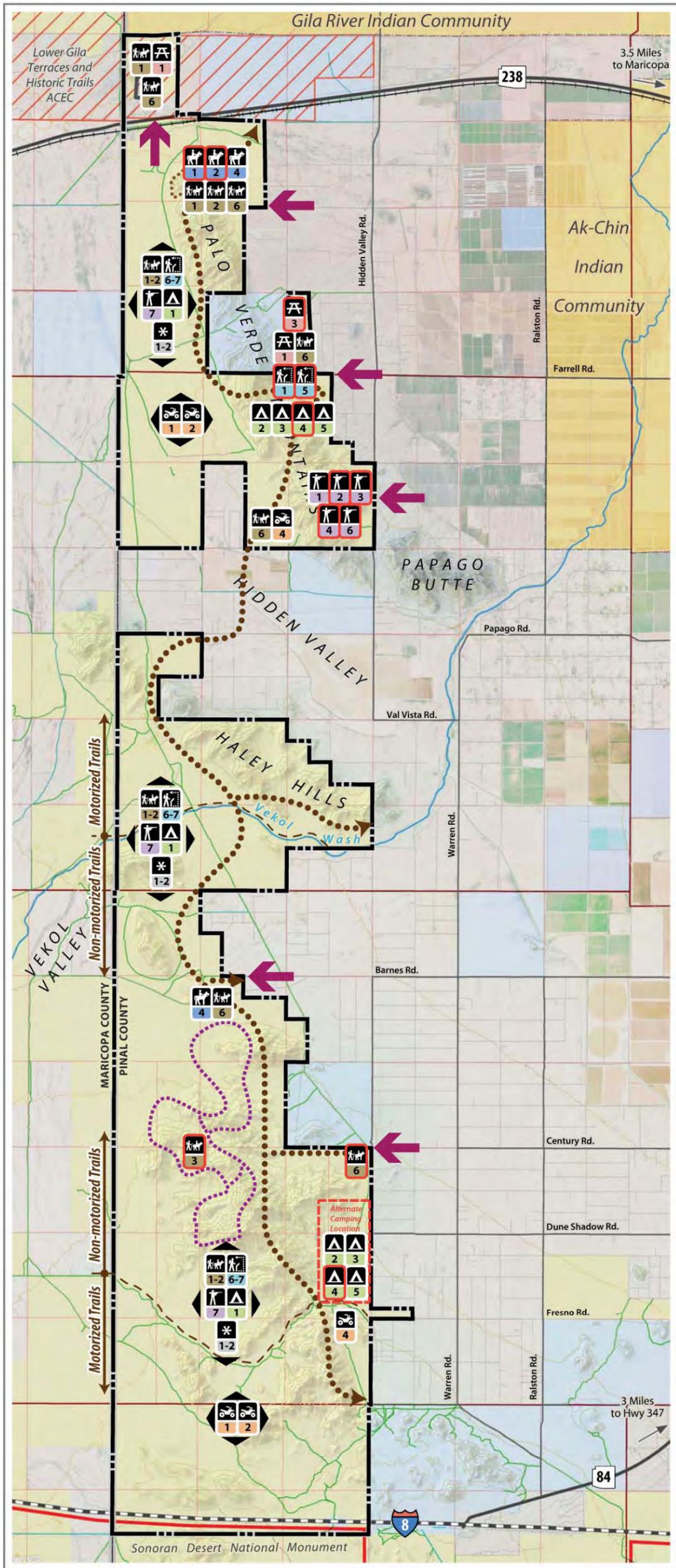


Figure 6-3 Palo Verde Alternative C

Palo Verde Regional Park

Alternative C: Moderate Change



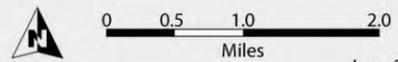
Reference Features

- Proposed Park Boundary
- BLM Tertiary Unpaved Road (These are the only BLM-authorized two-track roads)
- National Monument Boundary
- Area of Critical Environmental Concern (ACEC)
- State Trust Land
- Bureau of Land Management
- Pinal County Conceptual Trail Alignment
- Existing Secondary Trail

Proposed Recreation

| Facility/Activity | Complies with County Policy | Consider for Master Plan | Alternatives | | | |
|---|-----------------------------|--------------------------|--------------|-----|-----|-----|
| | | | A | B | C | D |
| Trail (Non-motorized for Hiking/Running, Biking, and Equestrian) | | | | | | |
| 1 Secondary Trails (2' Tread) | Yes | Yes | Yes | Yes | Yes | Yes |
| 2 Primary Trails (4' Tread) | Yes | Yes | No | Yes | Yes | Yes |
| 3 Competitive Tracks (Running, Biking, Equestrian) | Yes | Yes | No | No | Yes | Yes |
| 4 Interpretive Trails | Yes | Yes | No | No | No | Yes |
| 5 Barrier-Free Trails | Yes | Yes | No | No | No | Yes |
| 6 Trailhead Facility (Parking, Comfort Station) | Yes | Yes | No | Yes | Yes | Yes |
| Trails (Motorized) | | | | | | |
| 1 Single Track (Motorcycle) | Yes | Yes | ♦ | ♦ | ♦ | ♦ |
| 2 Two Track (Off-highway Vehicle) | Yes | Yes | ♦ | ♦ | ♦ | ♦ |
| 3 Jeep Tour | Yes | No | No | No | No | No |
| 4 Staging Area | Yes | Yes | No | Yes | Yes | Yes |
| 5 Passenger Car Loop | Yes | No | No | No | No | No |
| Equestrian | | | | | | |
| 1 Riding Stable (Equestrian Stalling, Non-Concessionaire) | ♦ | Yes | No | No | Yes | Yes |
| 2 Arena | ♦ | Yes | No | No | Yes | Yes |
| 3 Backcountry Water | Yes | Yes | ○ | ○ | ○ | ○ |
| 4 Staging Area | ♦ | Yes | No | Yes | Yes | Yes |
| Interpretive | | | | | | |
| 1 Interpretive Center | Yes | Yes | No | No | Yes | Yes |
| 2 Nature Center | Yes | Yes | No | No | No | Yes |
| 3 Museum/Cultural Center | Yes | Yes | No | No | No | Yes |
| 4 Botanical Garden | Yes | No | No | No | No | No |
| 5 Amphitheater (Small, up to 100 People) | Yes | Yes | No | No | Yes | Yes |
| 6 Wildlife Viewing/Bird Watching | Yes | Yes | Yes | Yes | Yes | Yes |
| 7 Photography | Yes | Yes | Yes | Yes | Yes | Yes |
| Picnic Area | | | | | | |
| 1 Family Area | Yes | Yes | No | Yes | Yes | Yes |
| 2 Large Group | Yes | Yes | No | No | No | Yes |
| 3 Playground | Yes | Yes | No | No | Yes | Yes |
| Camping | | | | | | |
| 1 Backcountry | Yes | Yes | Yes | Yes | Yes | Yes |
| 2 Tent Site | Yes | Yes | No | Yes | Yes | Yes |
| 3 RV/Trailer Camping (Unimproved) | Yes | Yes | No | Yes | Yes | Yes |
| 4 RV/Trailer Site (Electric, Water) | Yes | Yes | No | No | Yes | Yes |
| 5 Group Site | Yes | Yes | No | Yes | Yes | Yes |
| Shooting Sports | | | | | | |
| 1 Shooting Range (Pistol & Rifle) | ♦ | Yes | Dispersed | Yes | Yes | Yes |
| 2 Shotgun (Skeet/Trap/Sporting Clays) | ♦ | Yes | Dispersed | No | Yes | Yes |
| 3 Archery Range | ♦ | Yes | No | No | Yes | Yes |
| 4 Archery Field Course | ♦ | Yes | No | No | Yes | Yes |
| 5 Paintball Field | ♦ | Yes | No | No | No | Yes |
| 6 Shooting Sports Concession | ♦ | Yes | No | No | No | Yes |
| 7 Hunting, Backcountry | ♦ | Yes | Yes | Yes | Yes | Yes |
| Miscellaneous | | | | | | |
| 1 Geocaching | ♦ | Yes | Yes | Yes | Yes | Yes |
| 2 Rock Climbing | ♦ | Yes | Yes | Yes | Yes | Yes |
| 3 Challenge Course (Ropes Course) | ♦ | Yes | No | No | No | Yes |
| 4 Zip Line | ♦ | Yes | No | No | No | Yes |
| 5 BMX Bike Course | ♦ | Yes | No | No | No | Yes |
| 6 BMX Bike Pump Track | ♦ | Yes | No | No | No | Yes |
| 7 RC Aircraft Field | ♦ | Yes | No | No | No | Yes |
| 8 Large Event Area (Outdoor Theater Performance/Large Amphitheater) | Yes | No | No | No | No | No |
| 9 Off-Leash Dog Area | Yes | Yes | No | No | No | Yes |

- ♦ With provisions
- ♦ On authorized trails only
- Natural backcountry water sources already exist within the park
- Dispersed Activity Throughout
- Proposed Park Access
- Red Outline Indicates Added Activity in this Alternative
- Proposed Competitive Track



June 2016

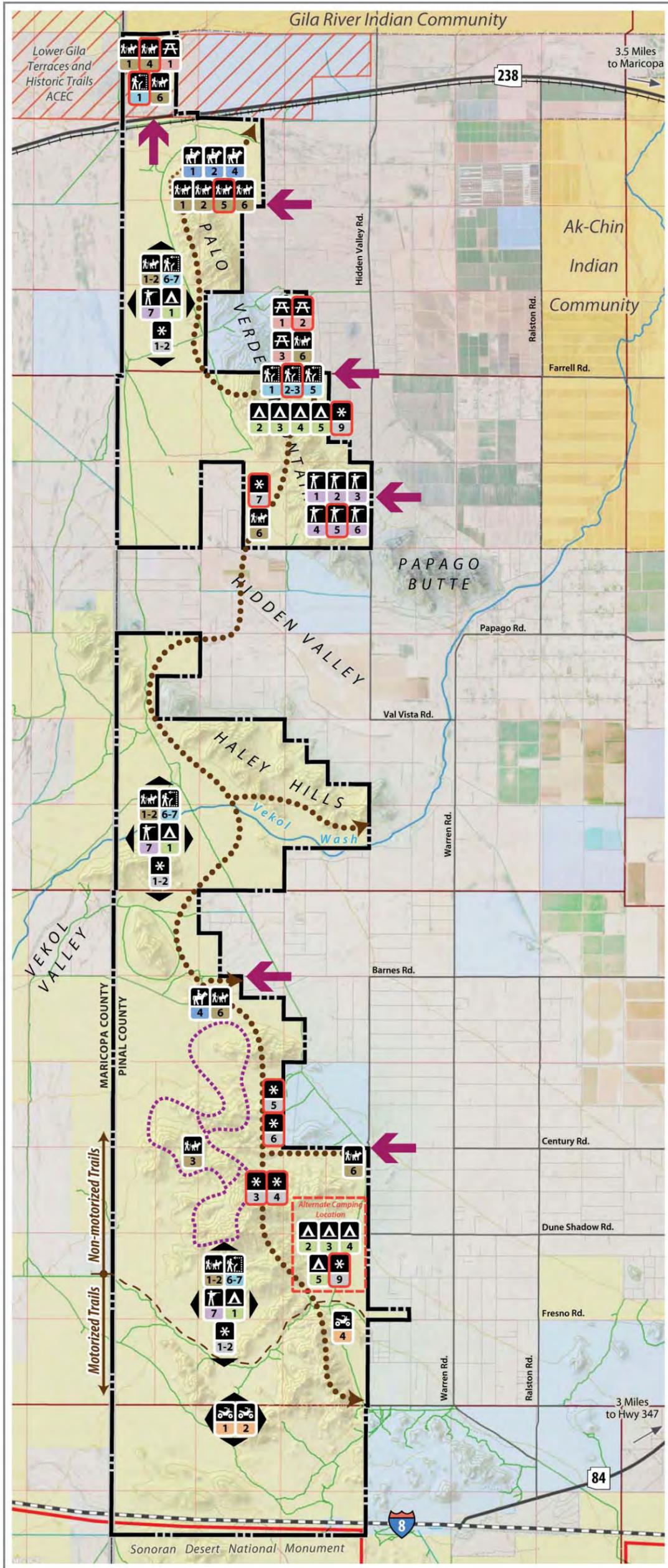


Figure 6-4 Palo Verde Alternative D

Palo Verde Regional Park

Alternative D: Most Change



PINAL COUNTY
wide open opportunity

Reference Features

- Proposed Park Boundary
- BLM Tertiary Unpaved Road (These are the only BLM-authorized two-track roads)
- National Monument Boundary
- Area of Critical Environmental Concern (ACEC)
- State Trust Land
- Bureau of Land Management
- Pinal County Conceptual Trail Alignment
- Existing Secondary Trail

Proposed Recreation

| Facility/Activity | Complies with County Policy | Consider for Master Plan | Alternatives | | | |
|---|-----------------------------|--------------------------|--------------|-----|-----|-----|
| | | | A | B | C | D |
| Trail (Non-motorized for Hiking/Running, Biking, and Equestrian) | | | | | | |
| 1 Secondary Trails (2' Tread) | Yes | Yes | Yes | Yes | Yes | Yes |
| 2 Primary Trails (4' Tread) | Yes | Yes | No | Yes | Yes | Yes |
| 3 Competitive Tracks (Running, Biking, Equestrian) | Yes | Yes | No | No | Yes | Yes |
| 4 Interpretive Trails | Yes | Yes | No | No | No | Yes |
| 5 Barrier-Free Trails | Yes | Yes | No | No | No | Yes |
| 6 Trailhead Facility (Parking, Comfort Station) | Yes | Yes | No | Yes | Yes | Yes |
| Trails (Motorized) | | | | | | |
| 1 Single Track (Motorcycle) | Yes | Yes | ♦ | ♦ | ♦ | ♦ |
| 2 Two Track (Off-highway Vehicle) | Yes | Yes | ♦ | ♦ | ♦ | ♦ |
| 3 Jeep Tour | Yes | No | No | No | No | No |
| 4 Staging Area | Yes | Yes | No | Yes | Yes | Yes |
| 5 Passenger Car Loop | Yes | No | No | No | No | No |
| Equestrian | | | | | | |
| 1 Riding Stable (Equestrian Stabling, Non-Concessionaire) | ★ | Yes | No | No | Yes | Yes |
| 2 Arena | ★ | Yes | No | No | No | Yes |
| 3 Backcountry Water | Yes | Yes | ○ | ○ | ○ | ○ |
| 4 Staging Area | ★ | Yes | No | Yes | Yes | Yes |
| Interpretive | | | | | | |
| 1 Interpretive Center | Yes | Yes | No | No | Yes | Yes |
| 2 Nature Center | Yes | Yes | No | No | No | Yes |
| 3 Museum/Cultural Center | Yes | Yes | No | No | No | Yes |
| 4 Botanical Garden | Yes | No | No | No | No | No |
| 5 Amphitheater (Small, up to 100 People) | Yes | Yes | No | No | Yes | Yes |
| 6 Wildlife Viewing/Bird Watching | Yes | Yes | Yes | Yes | Yes | Yes |
| 7 Photography | Yes | Yes | Yes | Yes | Yes | Yes |
| Picnic Area | | | | | | |
| 1 Family Area | Yes | Yes | No | Yes | Yes | Yes |
| 2 Large Group | Yes | Yes | No | No | No | Yes |
| 3 Playground | Yes | Yes | No | No | Yes | Yes |
| Camping | | | | | | |
| 1 Backcountry | Yes | Yes | Yes | Yes | Yes | Yes |
| 2 Tent Site | Yes | Yes | No | Yes | Yes | Yes |
| 3 RV/Trailer Camping (Unimproved) | Yes | Yes | No | Yes | Yes | Yes |
| 4 RV/Trailer Site (Electric, Water) | Yes | Yes | No | No | Yes | Yes |
| 5 Group Site | Yes | Yes | No | Yes | Yes | Yes |
| Shooting Sports | | | | | | |
| 1 Shooting Range (Pistol & Rifle) | ★ | Yes | Dispersed | Yes | Yes | Yes |
| 2 Shotgun (Skeet/Trap/Sporting Clays) | ★ | Yes | Dispersed | No | Yes | Yes |
| 3 Archery Range | ★ | Yes | No | No | Yes | Yes |
| 4 Archery Field Course | ★ | Yes | No | No | Yes | Yes |
| 5 Paintball Field | ★ | Yes | No | No | No | Yes |
| 6 Shooting Sports Concession | ★ | Yes | No | No | Yes | Yes |
| 7 Hunting, Backcountry | ★ | Yes | Yes | Yes | Yes | Yes |
| Miscellaneous | | | | | | |
| 1 Geocaching | ★ | Yes | Yes | Yes | Yes | Yes |
| 2 Rock Climbing | ★ | Yes | Yes | Yes | Yes | Yes |
| 3 Challenge Course (Ropes Course) | ★ | Yes | No | No | No | Yes |
| 4 Zip Line | ★ | Yes | No | No | No | Yes |
| 5 BMX Bike Course | ★ | Yes | No | No | No | Yes |
| 6 BMX Bike Pump Track | ★ | Yes | No | No | No | Yes |
| 7 RC Aircraft Field | ★ | Yes | No | No | No | Yes |
| 8 Large Event Area (Outdoor Theater Performance/Large Amphitheater) | Yes | No | No | No | No | No |
| 9 Off-Leash Dog Area | Yes | Yes | No | No | No | Yes |

★ With provisions
 ♦ On authorized trails only
 ○ Natural backcountry water sources already exist within the park

- Dispersed Activity Throughout
- ← Proposed Park Access
- Red Outline Indicates Added Activity in this Alternative
- Proposed Competitive Track



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June 2016

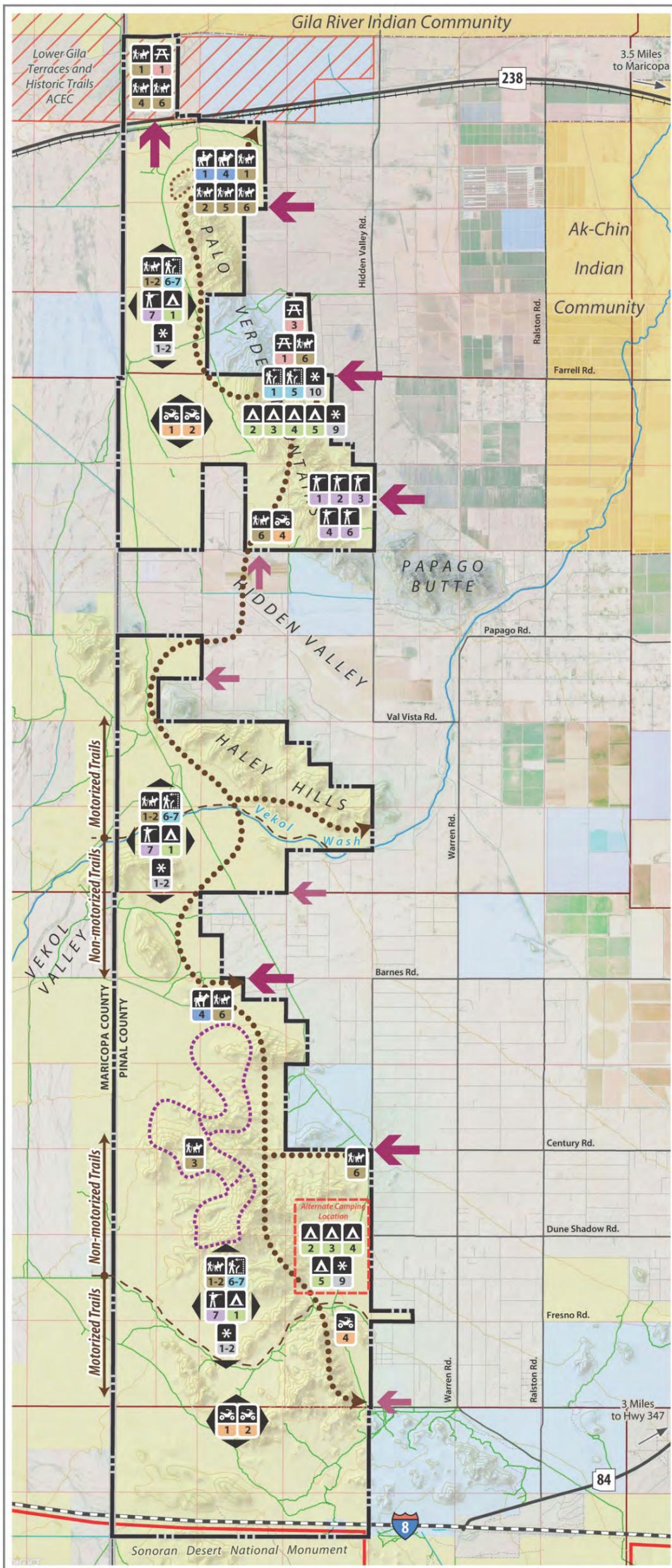


Figure 6-5 Preferred Alternative

Palo Verde Regional Park

DRAFT Preferred Alternative



PINAL COUNTY
wide open opportunity

Reference Features

- Proposed Park Boundary
- BLM Tertiary Unpaved Road (These are the only BLM-authorized two-track roads)
- National Monument Boundary
- Area of Critical Environmental Concern (ACEC)
- State Trust Land
- Bureau of Land Management
- Pinal County Conceptual Trail Alignment
- Existing Secondary Trail

Proposed Recreation

| Facility/Activity | Complies with County Policy | Consider for Master Plan | Preferred Alternative |
|---|-----------------------------|--------------------------|-----------------------|
| Trail (Non-motorized for Hiking/Running, Biking, and Equestrian) | | | |
| 1 Secondary Trails (2' Tread) | Yes | Yes | Yes |
| 2 Primary Trails (4' Tread) | Yes | Yes | Yes |
| 3 Competitive Tracks (Running, Biking, Equestrian) | Yes | Yes | Yes |
| 4 Interpretive Trails | Yes | Yes | Yes |
| 5 Barrier-Free Trails | Yes | Yes | Yes |
| 6 Trailhead Facility (Parking, Comfort Station) | Yes | Yes | Yes |
| Trails (Motorized) | | | |
| 1 Single Track (Motorcycle) | Yes | Yes | ♦ |
| 2 Two Track (Off-highway Vehicle) | Yes | No | ♦ |
| 3 Jeep Tour | Yes | No | No |
| 4 Staging Area | Yes | Yes | Yes |
| 5 Passenger Car Loop | Yes | No | No |
| Equestrian | | | |
| 1 Riding Stable (Equestrian Stabling, Non-Concessionaire) | ★ | Yes | Yes |
| 2 Arena | ★ | Yes | No |
| 3 Backcountry Water | Yes | Yes | ○ |
| 4 Staging Area | ★ | Yes | Yes |
| Interpretive | | | |
| 1 Interpretive Center | Yes | Yes | Yes |
| 2 Nature Center | Yes | No | No |
| 3 Museum/Cultural Center | Yes | Yes | No |
| 4 Botanical Garden | Yes | No | No |
| 5 Amphitheater (Small, up to 100 People) | Yes | Yes | Yes |
| 6 Wildlife Viewing/Bird Watching | Yes | Yes | Yes |
| 7 Photography | Yes | Yes | Yes |
| Picnic Area | | | |
| 1 Family Area | Yes | Yes | Yes |
| 2 Large Group | Yes | Yes | No |
| 3 Playground | Yes | Yes | Yes |
| Camping | | | |
| 1 Backcountry | Yes | Yes | Yes |
| 2 Tent Site | Yes | Yes | Yes |
| 3 RV/Trailer Camping (Unimproved) | Yes | Yes | Yes |
| 4 RV/Trailer Site (Electric, Water) | Yes | Yes | Yes |
| 5 Group Site | Yes | Yes | Yes |
| Shooting Sports | | | |
| 1 Shooting Range (Pistol & Rifle) | ★ | Yes | Yes |
| 2 Shotgun (Skeet/Trap/Sporting Clays) | ★ | Yes | Yes |
| 3 Archery Range | ★ | Yes | Yes |
| 4 Archery Field Course | ★ | Yes | Yes |
| 5 Paintball Field | ★ | Yes | No |
| 6 Shooting Sports Concession | ★ | Yes | Yes |
| 7 Hunting, Backcountry | ★ | Yes | Yes |
| Miscellaneous | | | |
| 1 Geocaching | ★ | Yes | Yes |
| 2 Rock Climbing | ★ | Yes | Yes |
| 3 Challenge Course (Ropes Course) | ★ | Yes | No |
| 4 Zip Line | ★ | Yes | No |
| 5 BMX Bike Course | ★ | Yes | No |
| 6 BMX Bike Pump Track | ★ | Yes | No |
| 7 RC Aircraft Field | ★ | Yes | No |
| 8 Large Event Area (Outdoor Theater Performance/Large Amphitheater) | Yes | No | No |
| 9 Off-Leash Dog Area | Yes | Yes | Yes |
| 10 Disc Golf | Yes | Yes | Yes |

★ With provisions
 ♦ On authorized trails only
 ○ Natural backcountry water sources already exist within the park

- Dispersed Activity Throughout
- ↖ Proposed Park Access, Primary
- ↖ Proposed Park Access, Secondary
- ⋯ Proposed Competitive Track



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Miles

September 2016

SECTION 7 – REFERENCES AND IMAGES

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