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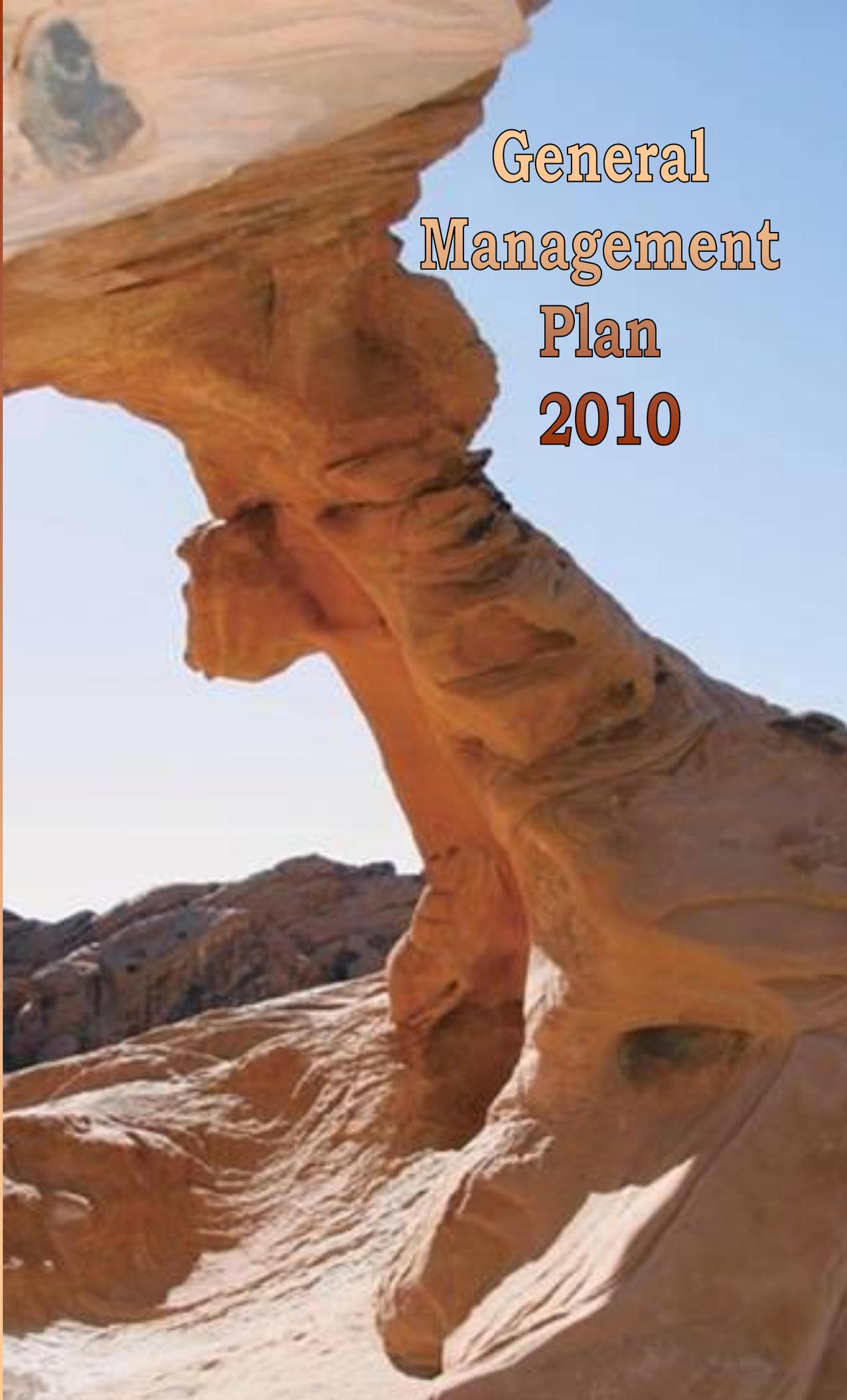
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General
Management
Plan
2010





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Executive Summary Valley of Fire State Park General Management Plan 2010

Plan Concept Provides Vision for Future

The following Park Concept will serve as Valley of Fire's vision for the next 15 years:

The Valley of Fire State Park offers some of the most unique natural landforms, archeological and paleontological resources and scenic values in the state of Nevada. Sensitive areas in this desert ecosystem are protected for future generations while allowing for compatible recreational use; public access is controlled through designated trails, roadways and recreation areas. The Park provides extensive interpretation and educational programs and amenities with an emphasis on engaging youth. Valley of Fire State Park will continue to be an outdoor classroom through research partnerships that support the conservation and protection of resources. All facilities in the park, including signs and interpretation, are designed to be unobtrusive, visually compatible with the natural landscape and consistent with scenic highway aesthetic standards.

This vision and related guidelines were developed through a collaborative planning process, which began with extensive data collection and analysis of existing land use, natural and cultural resources. A user survey, completed by UNLV, provided information related to visitor preferences. Public participation included surveys, public meetings and collaboration with community groups and key stakeholders, which were used to develop alternatives and the final plan.

General Management & Development Guidelines

Design Guidelines: Examine ways to incorporate green technologies in new facilities. Create designs that are consistent with the "desert ecosystem and paleolithic" theme. New trails or facilities will not impact rock formations and be consistent with the State Scenic Byway standards for aesthetics.

Visitors Center: Continue updating existing visitor center to address current educational needs and environmental treasures of the park and region. Continue to provide informational and educational books, pamphlets etc. related to natural history. Continue collaboration with school groups and classes.

Park Land Protection: The Park is encumbered under federal law which prohibits conversion of park lands into non-recreational/conservation use.

Geo-caching: Allowed by permit only and is managed under statewide policies.

Hunting: Not permitted due to public safety concerns in the park's many congested areas.

Safety Improvements: Install public safety kiosks and signs at trails that are long-distance, flash flood prone or where other dangers are known.

Park Entrances and Fee Collection: Add fee booth at east entrance.

System-wide Trail Enhancements: Define parking areas and add trail signs. Pursue partnerships grants and alternative funding sources to complete trail enhancements.



Issue Specific Guidelines

Utilities and Park Infrastructure

The utilities in the state park are mostly original. Many of the facilities for visitors have been upgraded or renovated except for a few restrooms. Constant maintenance with multiple delays in water and electrical service occurs. Due to the lack of projected general funding, the renovation of the basic infrastructure to park utilities, with service the park staff and visitors is the priority of this Development Plan (*see back page*).

Natural Resource Management

- Continue to work cooperatively with the Nevada Department of Wildlife & US Fish and Wildlife Service to manage plants and animal habitats under the Clark County Multi-Species Habitat Conservation Plan.
- Continue weed abatement especially on tamarisk.
- Continue collaboration with Nevada State Parks Cooperative Association (NSPCA) on informational and educational books, pamphlets etc. related to natural history. Continue collaboration with school groups and classes.

Cultural and Paleontological Resources

- Protect and interpret the historic, cultural and paleontological resources
- Continue partnerships with professional groups and UNLV to complete comprehensive surveys.
- Continue interpretive planning and upgrade or add educational displays at all significant sites as determined needed and appropriate.
- In areas where the significance of the find, or the level of vandalism is extraordinary; management may include prohibiting access to resources with the use of barriers, fences, obscuring areas, or bury in situ if needed.

Northern Management Area (NMA)

Includes Logandale Motorized Trails within the State Park.

Motorized use will be allowed on designated trails only associated with the Logandale trail system. Strive to find and designate one connector trail through north end of park through future cooperative efforts with BLM and Clark County.

- Use of the area should be under annual state park permit, or park day use fee.
- Signage and public education must be significantly increased through partnerships with local clubs, BLM, and grants.
- With the exception of designated Logandale trails in the northern management areas, motorized use is limited to street legal vehicles on designated roads.

NMA Special OHV Events

- The number and type of special OHV events to be permitted in NMA is contingent upon state park policy. Special OHV events require permits.
- Install signs designating exact trail route(s). GPS these routes and make available for download from park website. Designated trails are open to the public.



Planning Partners

Bureau of
Land Management

Clark County

National Park Service

*Lake Mead National
Recreation Area*

*Land and Water
Conservation Fund*

*Rivers, Trails &
Conservation
Assistance (RTCA)*

Nevada Natural
Heritage Program

Partners in
Conservation (PIC)

UNLV Landscape
Architecture &
Planning Research
Office



Increased protection of cultural sites through fencing or other means will protect these resources for future generations.

As a result of the Master Plan, over 33 miles of existing trails are designated. Planned facilities include the Fire Canyon Wash and the Duck Creek Trails and roadway improvements for cyclists. Additionally, existing social trails are planned to be restored.



An amphitheater is planned for Atlatl Rock, a popular destination for school field trips and educational programs.

Issue Specific Guidelines

NMA Non-Motorized Trails

- Allow equestrian use on same trails as motorized OHV. However, there will be no official designations for equestrian trails or equestrian trailhead development on those trails.
- Investigate non-motorized trails (pedestrian and equestrian) in the north that are separate from motorized trails.
- Identify equestrian parking/trailheads in collaboration with BLM, Clark County, Moapa Valley and Overton; work cooperatively with stakeholders to designate and sign these trails.

NMA Camping

Identify and designate primitive camp areas to be used by permit only and fee based. These would be dry camping sites/areas and fire rings and sanitary facilities would be installed if feasible.

Southern Management Area (SMA) - Trails

- Formally design/build, designate and sign current trails. Trail system includes both constructed trails and routes.
- Upgrade all trailheads to include interpretive and safety kiosks.
- Mediate problems with “migrating parking areas” with defined borders of rock/curbing and/or pavement where needed based on soils stability and natural environment. Install barriers where needed for protection of resources. Add the Duck Rock equestrian route and trailhead, Fire Wash trail and equestrian trailhead.
- Close road located past Fire Canyon Vista to motorized vehicles; open only for marathon, pedestrian and administrative use.

Biking and Marathon Trail

- Expand shoulders to improve safety for cyclists. Define and mark pull-outs.
- Work with neighboring agencies to plan potential extensions of the expanded roadway shoulder in the future.

Camping in Southern Management Area

- Maintain current sites and add walk-in tent sites.
- Determine where to implement tent and car camping “non-generator” sites at Arch Rock.

Issue Specific Guidelines (continued)

Day Use Picnicking (SMA)

- Improve facilities including upgraded restrooms, interpretive signs, parking and roads, BBQ grills and shade structures.
- Redesign Beehives area to accommodate additional use and provide drinking water where feasible.
- Pave roads and parking areas where needed based on soils stability and natural environment. Install barriers where needed for protection of resources.
- If water development becomes feasible, upgrade water developments in all areas as affordable. Otherwise, manage as dry sites.

Staging Area for Movies and Special Events

- Re-grade unpaved parking area and add drainage improvements.
- Design staging area to be lower than road, hidden from view of Visitors Center and scenic byway.
- Do not provide comfort facilities or water unless water development becomes feasible.

Atlatl Rock Picnic Area and Proposed Amphitheater

Upgrade/replace restrooms, signs and kiosks. Develop an amphitheater to seat 50-100 people based on architect's design and redesign of parking area. Follow design guidelines to blend structures in with rock and natural environment.

Weddings

- Specific areas for weddings by permit only. Four existing areas: Visitors Center, Rainbow, Seven Sisters and Cabins.
- Maximum of 2 weddings per site per day.
- Monitor sites for damage and close/rehab as needed. New areas can be opened to meet demand or increased per day with addition of permanent full-time staff needed to manage workload.

Land Acquisition Plan

State Parks continues to explore opportunities to consolidate management boundaries and connect park lands. Continually investigate opportunities for acquisition of private lands that link north end with south end. Dispose of or consider trades for outlying park parcels in order to consolidate park lands for increased recreation viability and management efficiency.

Interpretation and Education

- Strive to find funding to increase interpretive/education.
- Increase focus on education of children in the outdoors.
- Strive to find funding to hire one FTE interpreter.
- Develop partnerships with local communities and regional partners to take Valley of Fire interpretive messages to the community.

Development Plan

Available funding and funding opportunities will drive the priority of implementing the following upgrades and improvements:

Utilities: Replace dilapidated electric line and conduit, waterline and tanks, and telemetry systems. Continue to explore water availability. Upgrade toilets where needed using green technology if feasible.

Fire Wash Trail: Design, layout and construct Fire Wash trail, trailheads, parking and signs. Add water source and design and construct equestrian trailhead if feasible.

Access Points: Redesign parking areas at trailheads and scenic vistas. Delineate parking areas with structures.

Signs: Renovate/replace old signs and kiosks. Install public safety kiosks and signs at trails that are long-distance, flash flood prone or where other dangers are known. Place directional signage on all trails and routes as needed.

Restore: Re-seed and naturalize social trails in all areas of the park that are not designated trails or routes.

Beehives: Redesign and re-develop parking area and road to group use area.

Atlatl: Designate or develop tent sites at Atlatl Campground.

Duck Rock: Design and construct new trailhead parking.

Fire Canyon Scenic Vista: Design and construct new parking area and interpretive kiosks.

Fee Booth: Add fee booth at East Entrance.



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Technical assistance:
National Park Service RTCA

I. INTRODUCTION

Valley of Fire State Park offers some of the most unique natural land forms in the state of Nevada. Valley of Fire is one of Nevada's oldest and the largest state park, dedicated in 1934. The valley derives its name from the red sandstone formations and the stark beauty of the Mojave Desert. Ancient trees and early man are represented throughout the park by areas of petrified wood and 3,000 year-old Indian petroglyphs.

A. PURPOSE OF PLAN AMENDMENT

1. Purpose

The purpose of this plan amendment is to update the 1990 long-range management plan for Valley of Fire State Park. The plan begins with an introduction to the document and the park in Chapter 1. Chapter 2 discusses regional influences which directly and indirectly affect the park. Chapter 3 describes the park's natural and cultural resources, including existing facilities and description of uses. Chapter 4 summarizes the planning process and the resulting plan.

2. Planning Process

The current Valley of Fire planning process encompasses work by the Nevada Division of State Parks (NDSP), University of Nevada, Las Vegas (UNLV), partnering agencies, technical assistance from the National Park Service River, Trails and Conservation Assistance (RTCA) Program, and input from the public from 2007-2009. Funding was provided by the Nevada Division of State Parks and from the Land and Water Conservation Fund administered by the National Park Service. Details of the process can be found in Chapter 4.

a. Past Plans

Past plans addressing visual integrity and environmental sensitivity, recreation facilities and other issues were reviewed and used in identifying preliminary issues to be addressed during the planning effort. These plans included:

- Valley of Fire State Park Master Plan (NDSP, 1990)
- Nevada's Statewide Comprehensive Outdoor Recreation Plan (SCORP) – Assessment and Policy Plan (NDSP, 2003)
- Nevada State Recreational Trails Plan (Nevada Division of State Parks Planning and Development Section, 2005)
- Clark County, Multiple Species Habitat Conservation Plan (2000)
- BLM Logandale Trails Monitoring Plan (2007)
- BLM Integrated Resource and Recreation Area Management Plan of the Logandale Trails System (2007)

- Splendor Among the Rocks-Archeological Paper #4, Volumes 1 and 2, The
- Community College of Southern Nevada Field School, Dept. of Human Behavior, Dr. Devin Rafferty (July, 2004)
- NDOW State Action Plan (2005)
- Moapa Valley Open Space Plan; Clark County, NV (In progress)
- Moapa Valley Trails Study; Clark County, NV (In progress)
- Northeast Clark County Land Use Plan (2006)
- Moapa Valley Master Plan; Parks and Recreation, 20-Year Plan (2007)
- Lake Mead Mgmt. Plan (2002); General Mgmt. Plan/EA (Sept. 2005)

b. Planning Team and Key Stakeholders

Several people were instrumental in the gathering of information and the writing of the plan. Others were important in the issue identification and alternatives development meetings.

1. Jenny Scanland, NDSP, Parks and Recreation Program Manager
2. Deborah Reardon, National Park Service, Rivers, Trails and Conservation Assistance Program
3. Jim Hammons, NDSP, Valley of Fire Supervisor
4. Russ Dapsauski and Terry Hansen, NDSP, Southern Regional Managers
5. Elise McAllister, Partners in Conservation
6. Marilyn Peterson, Bureau of Land Management, Recreation Planner
7. Jim Holland, National Park Service, Lake Mead National Recreation Area
8. Matt Lacroix, Clark County Liaison to Moapa Valley
9. J. Steve Weaver, NDSP, Deputy Administrator
10. Dr. Kevin Rafferty, Department of Human Behavior, College of Southern Nevada

B. PARK SETTING

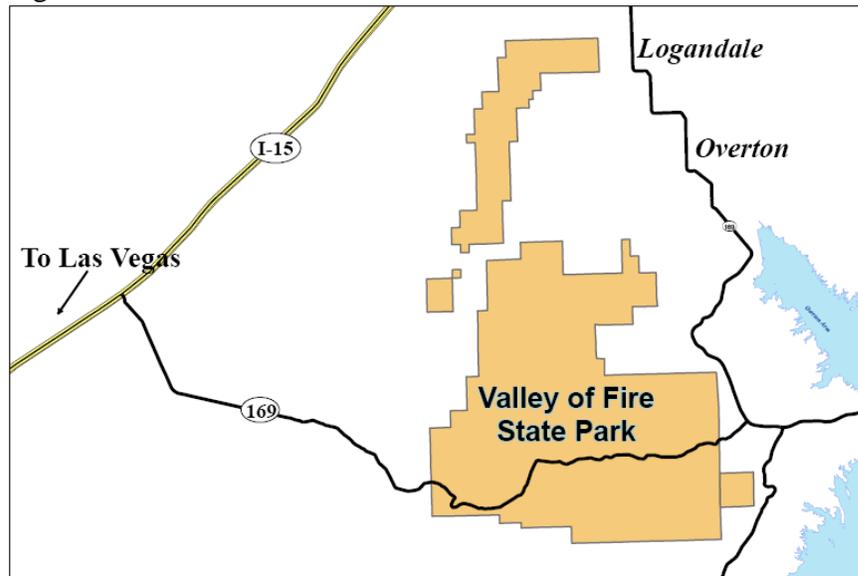
1. Description and Location

a. Description of Park and Location

Valley of Fire State Park is located approximately six miles west of the northern arm of Lake Mead and 55 miles northeast of Las Vegas. It is reached via Interstate 15 and State Highway 169. The park currently encompasses 42,059.48 acres (Certified by State Lands, 2009). State Highway 169 offers access into the park at its east and west boundaries. (Figure 1.1; Park Location Map).

Developed facilities include family and group picnic areas, two campgrounds, trails, several vista/overlooks and rest areas. Also provided is a staffed visitor center with offices, staff residences and maintenance facility. There are also memorial/historic markers, and interpretive sites for petroglyphs and petrified wood displays. Details of facilities provided are in Chapter 3.

Figure 1.1 Park Location



b. Physical setting of the area

The park is situated in the valley created by the North Muddy Mountains to the west and Muddy Mountains to the south. The Moapa Valley lies to the northeast and the Overton Arm of Lake Mead to the east. The valley along with the surrounding mountains is sparsely vegetated and arid in character. The park offers a wide variety of natural and cultural resources for visitors. The primary and most striking features of the park are the red sandstone formations found throughout the site. These formations and their color provide interesting contrast to the surrounding desert. In addition to these naturally carved formations, the park also has an extensive number of petroglyphs. The park's isolation adds to its uniqueness.

c. Property Ownership

Lands administered by the U.S. Bureau of Land Management border the park on the west, north and south. Lake Mead National Recreation Area, administered by the National Park Service, lies directly east of the park. The park is also bordered by lands managed by the Bureau of Reclamation, Bureau of Lands Management and private property owners. (Appendix 1.1 Land Ownership Map) Since 1980,

the park has grown to encompass over 35,300 acres. (Appendix 1.2 History of Acquisition)

2. Legislation and Policy

a. Legislated Goal

The Nevada Division of State Parks (Division) is one of many agencies within the Department of Conservation and Natural Resources. The Division is directed by legislative intent to: “acquire, protect, develop and interpret a well balanced system of areas of outstanding scenic, recreational, scientific and historical importance for the inspiration, use and enjoyment of the People of the State of Nevada and that such areas shall be held in trust as irreplaceable portions of Nevada’s natural and historic heritage” (NRS 407.013).

b. NV Administrative Code; Park Specific

NAC 407.350 Valley of Fire State Park. ([NRS 407.0475](#), [407.065](#))

1. Within the Valley of Fire State Park, a person shall not climb a rock formation or otherwise engage in rock climbing except in an area designated for such climbing by the Supervisor of the Park.

2. A person climbing in such an area:

(a) May use ropes, carabineers, web belts, webbing and cushioning materials.

(b) Shall not use any pitons, chocks, or other such climbing devices or any magnesium carbonate chalk in climbing unless:

(1) The person is engaged in emergency rescue operations; or

(2) The Supervisor of the Park approves the use of such devices or chalk.

[Div. of St. Parks, eff. 1-2-80]—(NAC A 8-17-82; 12-31-85, eff. 1-1-86; 11-12-93; R118-01, 12-17-2001; R153-03, 1-16-2004; R149-05, 5-4-2006)

c. Land and Water Conservation Fund Protection

All of the State of Nevada owned acreage within the boundary of the Park is under the protection of the Land and Water Conservation Fund (LWCF) 6(f)3 provision. By federal law, property acquired or developed with LWCF assistance shall be retained and used for public outdoor recreation uses only. Therefore, no portion of the park may be wholly or partly converted to other than public outdoor recreation uses without the approval of the National Park Service Regional Director pursuant to Section 6(f)3 of the LWCF Act and 36 CFR part 59. All facilities must be compatible and support outdoor recreation.

3. 1990 Goals/Objectives

This planning process will address the applicability of the 1990 goals and objectives from the past plan and update them to address the demands and needs of recreation while continuing to protect the park's unique resources. The timeframe for this plan is 15 years, or from 2010 to 2025. Below are the goals and objectives for the park that are being considered for revision:

a. 1990 Plan Concept

The 1990 plan described the park concept as follows: Valley of Fire State Park offers some of the most unique natural land forms in the state of Nevada. The protection of these resources is the primary objective of State Parks.

- Along with resource conservation, in 1990, State Parks was looking into ways to increase visitation and provide greater use of the resources through increased public access.
- Resource conservation and increased park access were both elements which were to be managed at an appropriate level to provide for a broad range of recreational activities from the most passive to the more demanding activities of primitive camping and climbing.
- The 1990 plan stated that access was the key to providing these activities to the broadest range of age groups and physical abilities.
- Paved access was to be provided to park staff and the public; in order to provide easier and more efficient means of patrolling and managing the park.

The new Plan Concept was developed by staff and the public in December, 2009. This park concept consists of five mission statements that will direct the park's management for the next 15 years or until amended or revised.

Park Concept 2009:

The Valley of Fire State Park offers some of the most unique natural landforms, archeological and paleontological resources and scenic values in the state of Nevada.

Sensitive areas in this desert ecosystem are protected for future generations while allowing for compatible recreational use; public access is controlled through designated trails, roadways and recreation areas.

The Park provides extensive interpretation and educational programs and amenities with an emphasis on engaging youth.

Valley of Fire State Park will continue to be an outdoor classroom through research partnerships that support the conservation and protection of resources.

All facilities in the park, including signs and interpretation, are designed to be unobtrusive, visually compatible with the natural landscape and consistent with scenic highway aesthetic standards.

b. 1990 Natural/Cultural Resource Objectives

- All natural components of the park (flora, fauna, soils and geology) were to be identified so that they may be protected, interpreted and managed adequately.
- Endangered, rare or protected species were to be identified, located and protected as befitted the situation.
- Cultural resources were to be protected and maintained in an appropriate manner; visitor safety and convenience were to be kept foremost when considering maintenance projects on historic structures.
- Since the site contains major works of prehistoric petroglyphs, great care was to be taken in exhibiting, interpreting, and protecting these resources for future generations.

4. Major Current Issues

a. Park Specific Issues

Fragile Desert Ecosystem: Valley of Fire at first glance would appear to be a barren desolate desert with little or no life. In fact, Valley of Fire is a very fragile environment where hundreds of species of flora and fauna live. Many of them are highly specialized to contend with the harsh desert environment. As such, minor alterations to the ecosystem could have dramatic effects. The cutting of indiscriminate 4WD trails and hiking, equestrian or biking social trails, can produce scars on the landscape that may take tens or even hundreds of years to erase.

The unique geology and erosion which created the colorful geologic formations of the park is an ongoing process. Consequently, careful consideration must be given to the location of facilities to prevent scenic degradation or more practical considerations such as damage from flooding.

Human activities have impacted the environment of the park throughout its history. To date, the impact of man on the valley has left the park with unique rock carvings or petroglyphs. The site has been historically a site for hunting by many generations. The remote location and absence of potable surface water has helped to protect the valley from incursions by modern man.

- 1) **Uncontrolled Access:** Major concerns expressed during preparation of the 1990 plan and that continue today are the lack of access to the formations and areas in the northern portion of the park. Some participants wanted to see wide open access to the park from all points of entry. Logistically this seemed much too difficult from the aspect of staff resources available in 1990 and it still does today. The past plan recommended that a second fee booth be installed on the eastern entrance road in order to increase public contact and provide additional information and educational materials to the public. This has not occurred yet.
- 2) **Off-road vehicle (OHV):** Unauthorized use is resulting in resource degradation in the north half of the park. The Park boundary marking is not comprehensive and the adjacent Logandale OHV trail system passes near and through the park in several places. Increased educational and directional signage is needed to direct the users to designated trails. The problem of unauthorized public use is also enhanced by the number of access points to the park. The park has not been able to provide control of all access points and therefore gain control of undesirable park use. The lack of funding for operations in the park, education and interpretational signage has had to be utilized to the fullest extent affordable to control and redirect motorized use and reduce resource damage.
- 3) **Flora and Fauna, and their Habitat:** The Multiple Species Habitat Conservation Plan for this region includes the VOF and the park is a partner in those efforts. Inventory of Threatened, Endangered and State Listed Species and habitats needs to occur in the park to aid management in protection of these species and their habitats. The Division utilizes our partner agency Natural Heritage to help identify known habitats and species presence.
- 4) **Vandalism of Petroglyphs and Petrified Wood Sites:** Vandalism is a problem within the park and the fragile nature of these resources and their locations make them difficult to protect. Climbing within the park is addressed through NAC 407.350 (see previous section 2.b.) and prohibits these activities from leaving lasting effects on the park's formations. Inventory of paleontological and archaeological sites has occurred and mitigation as well as protective interpretive panels and facilities

are in place to protect known sites. However, fencing is not adequate to stop vandals from removing the petrified wood from the park at this time and theft occurred in 2007.

- 5) **Special Uses Movie Sets:** The Park has been the site of many motion pictures, music videos and commercials. Problems have occurred which have resulted in the destruction and scarring of the landscape. Most of these problems have occurred due to carelessness and not through malicious activities. Additionally, there is a greater need for staging areas for movies and large events.
- 6) **Special Uses Weddings:** The Park is under great demand for special use permits for weddings. The number of requests is over that which current staff can manage while still managing the rest of the park users, maintenance and administration.
- 7) **Trails:** Due to the lack of natural water availability, extreme heat during the summers and the unsuitable nature of the soils, most of the trails in the park are fairly short distance. The unstable nature of the soils does not allow for sustainable trails that are accessible in most areas.
- 8) **Day and Overnight Use:** Conflicts have arisen in the past between car campers and RV campers related to noise and generators. The latest campground installation (2008) should help as it provides a RV hook-up section that is separated from the rest of the campsites. There is also a need to renovate the current group picnic facilities and group camping facilities.

II. REGIONAL INFLUENCES

A. PARK HISTORY

1. History of the Area

Recorded history at Valley of Fire began in 1826 when the first Europeans, mostly fur trappers, entered the valley. One of the first explorers to cross the valley was Jedediah Smith, a well known mountain man. Smith's route, which followed the Virgin River, brought travelers from Santa Fe westward. Another pioneer trail which passed near the park was known as the Spanish Trail and was actively used during the 1830's and 1840's. The Spanish Trail passes to the west of the park.

The treaty of Guadalupe Hidalgo ceded land from Mexico to the United States in 1848 and this land treaty encompassed all of southern Nevada, including the Valley of Fire.

Through the 1840's the Spanish Trail, also known as the Mormon Road, became a main route from Salt Lake City to southern California. The use of trails by white immigrants was a traumatic shock to the Paiute people who lived in the area. Occasional hostilities broke out between the two cultures concerning ownership of land and animals. Farming, which brought with it land ownership, slowly displaced the Native American population. Mormon colonists started to establish settlements along the Muddy and Virgin Rivers, adjacent to the park.

One of the better known legends which involves the park, concerns a Paiute Indian by the name of Mouse. Mouse was considered a renegade by the white settlers and an outcast by his own tribe. As with many legends, the facts are not always clear or agreed upon. According to one story, Mouse was employed by George Bonelli, a merchant and rancher as a hand on a ferry at Bonelli's Landing. Mouse's trouble began when he shot up an Indian camp while drinking one evening. Mouse was locked up and later ferried across the river and left in Arizona. He then, reportedly, killed two white prospectors and fled to the Valley of Fire.

Several searches were conducted to locate him and bring him to justice. Mouse's hideout within the rugged landscape of Valley of Fire made him difficult to track. From his hideout, Mouse made several forays into the settlement to steal goods and materials. The search parties were always puzzled how Mouse could live within the valley since no running water was available. However, Mouse knew the valley very well and discovered a natural depression within the rocks which would hold rain water for months at a time. This depression is known today as "Mouse's Tank" and is a popular attraction within the park.

Mouse was finally found on July 11, 1897 by a posse which ordered him to surrender near Muddy Spring. Mouse did not surrender and instead had an hour long running gun fight with his pursuers before finally being shot.

The Moapa Indian Reservation was created in 1872 along the Muddy River. The reservation contains approximately 72,000 acres near the park. As time progressed, the river valley became more intensively farmed with the introduction of modern irrigation and fertilizers.

In addition to farming, mining for minerals such as gypsum, magnetite, silica, borates and lithium took place in the area. The valley did not contain large mineral deposits and was not intensively mined. The mines that used to operate in the park are closed and rehabilitated as of 2007.

The Valley of Fire became a wagon road cutoff to Las Vegas in the latter part of the 19th century and early 20th century. In 1914 Clark County built a dirt road through the Valley to serve as part of the Arrowhead Trail between Salt Lake City and Los Angeles. The route was abandoned in 1925 when a more northerly route

was established along present-day Interstate 15. Before the trail was abandoned, an official of the American Automobile Association named the Valley after seeing it near sunset ablaze with red-orange color.

Beginning in 2007, the neighboring Lake Mead National Recreation Area began to lose significant amounts of water due to drought. The impacts of the lowering of the lake on the use of that NRA has not been measured yet in terms of its impact on the Valley of Fire State Park. The lake remains at record low levels and current use is reflecting those low levels.

2. History of Valley of Fire State Park

In 1914, Clark Co. helped in the building of a rough road through the valley to serve a segment of the Arrowhead Trail. In the 1920's, Governor James Scrugham recognized the beauty of the Valley and requested transfer of the land from federal public domain to the state. Valley of Fire was officially dedicated as Nevada's first state park in 1934. The first major construction within the park occurred between 1933 and 1935. This construction included a road and the "Cabins" built by the Civilian Conservation Corps. The "Cabins", small stone structures, were built to accommodate overnight travelers. The CCC was under the direction of Colonel Thomas W. Miller of Caliente, Nevada and continued for several years.

In the decades that followed, legislative appropriations were very meager with no personnel available for maintenance. Funds for the park were cutoff entirely during World War II. The Baker Act, passed in 1940, eliminated the Valley of Fire from the State park system, ironically based on the premise that the park was too isolated and inaccessible and had no recreational value.

Several prominent Nevadans opposed the closing, including former Governor Scrugham, Colonel Miller and the Perkins family. As a result of this vocal opposition, the Baker Act was repealed around 1955. During this period, Governor Charles H. Russell stimulated the park system by appointing a new commission which elected Colonel Miller as chairman. The colonel's appearance at a hearing of the 1955 legislature led to a biennium appropriation of \$4,000 for the commission. Valley of Fire, soon after, was given its first superintendent and ranger. An office was leased and a truck was purchased for the park. The "Cabins" were allocated \$500 for improving the structure.

Establishment of the modern Valley of Fire State Park began with the addition of facilities such as campgrounds and a Visitor Information Center in the late 1960's. (1969,Wirth; Park System Plan, 1997) From 1990 to 2008 many improvements have been made in the park. Trails have been designated and signed, petroglyphs have been made more accessible with stairs and protected from visitors touching or scraping the sites. Interpretive programs have been developed and implemented as well. The White Domes road was paved and Arch Rock and Atlatl Rock

campgrounds were developed. A new campground loop at Atlatl Rock was installed in 2008 which provides additional sites that have full RV hookups. Many of the toilets were upgraded in the 90's and shade structures at the group sites were improved. The most current development project is that of new offices, staff living quarters and an upgraded Visitors Center, which is in progress.

The Park has undergone significant changes in landownership through the years. Prior to 1973 the Valley of Fire State Park included approximately 34,000 acres and included those lands which make up the main core of the park. In 1973 a Patent was applied for through the Bureau of Land Management, Recreation and Public Purpose Lease program for acreage on the north backcountry section and a few acres on the east side of the park. The acreages in those applications changed many times as the process was completed. In 2006 an additional 420 acre in-holding was acquired in the northern section of the Park called the White-Gro mine. The current total acreage of park land is 42,059.48.

B. DEMOGRAPHICS

1. Historic

The Valley of Fire derives its name from red sandstone formations, formed from great shifting sand dunes during the age of dinosaurs, 150 million years ago. Complex uplifting and faulting of the region, followed by extensive erosion, have created the present landscape. Prehistoric users of the Valley of Fire included the Basket Maker people and later the Anasazi Pueblo farmers from the nearby fertile Moapa Valley. The approximate span of occupation has been dated from 300 B.C. to 1150 A.D. Their visits probably involved hunting, food gathering, and religious ceremonies, although scarcity of water would have limited the length of their stay. The growth around Valley of Fire State Park was never explosive but did increase through the settlement of the farms and ranches near Overton and the Moapa Valley. The greatest impact of population on the Valley of Fire has been and still is from the urban center of Las Vegas.

2. Existing/Projected

The park is situated in the valley created by the North Muddy Mountains to the west and Muddy Mountains to the south. The Moapa Valley lies to the northwest and the Overton Arm of Lake Mead to the east. The valley along with the surrounding mountains is sparsely vegetated and arid in character. The park offers a wide variety of natural and cultural resources for visitors. The primary and most striking features of the park are the red sandstone formations found throughout the site. These formations and their color provide interesting contrast to the surrounding desert. In addition to these naturally carved formations, the park also has an extensive number of petroglyphs. The park's isolation also helps give the park its unique character

a. Clark County Demographics

Demographics and socioeconomic condition for Clark County, Las Vegas and the State of Nevada are in flux during this planning period due to a significant national economic recession.

Average Annual Population Growth 1990-2008 5.22% (declining)

Source: Clark County Annual Population Estimates

Average Monthly In-Migration - 2008 -2,396 (declining)

Source: Clark County Comprehensive Planning / NV Bureau of Health Planning & Statistics Preliminary '07 Annual Birth & Death Rates

Annual Job Growth Rate Las Vegas- - 4 . 5 % (declining)

Unemployment Rate - Las Vegas-Paradise MSA 10.1% (increasing)

Source: Nevada Dept. of Employment, Training & Rehabilitation (2/09)

As of the 2000 census, approximately 1.4 million people resided in the county.

Population estimates by Clark County for 2008 were 1,986,146 and growing.

However, due to the economic recession, Clark County and Las Vegas have experienced a large number of home foreclosures and job losses. This has resulted in a drop in population. University of Nevada, Reno economist Tom Cargill estimated that there would be a declining population in Clark County due to the recession in 2010.

However, this is disputed by the Clark County 2009 Comprehensive planning Demographer estimates which show increases in population through 2035.

Described below are the results of the 2005 census estimates, combined with 2006 and 2009 data as provided by the County and State.

The racial makeup of the county in 2005 was 54.5% Caucasian Non Hispanic, 26.1% Hispanic, 10.1% Black or African American, 1.0% Native American Indian, 6.7% Asian, 0.6% Pacific Islander, and 2.8% from two or more races (Figure 2.1 Clark County Racial Make Up).

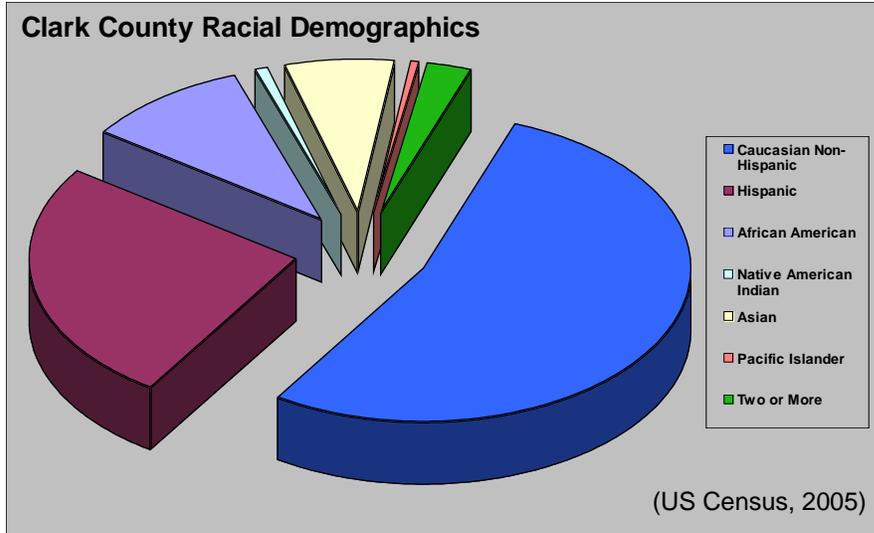


Figure 2.1 Clark County Racial Makeup
 Minorities make up almost half of Clark County’s population.

By 2005, there were 637,740 households of which 414,377 were family households (Figure 2.2 Clark County Household Demographics). Of the family households, 47% had children under the age of 18 living with them. There were 122,383 family households comprised of single parent households, with approximately two times as many single female parents as male parents. There were 171,314 households with individuals living alone. There were 132,561 households with one or more people 65 years of age or older. The average household size was 2.65 and the average family size was 3.25 (US Census, 2005).

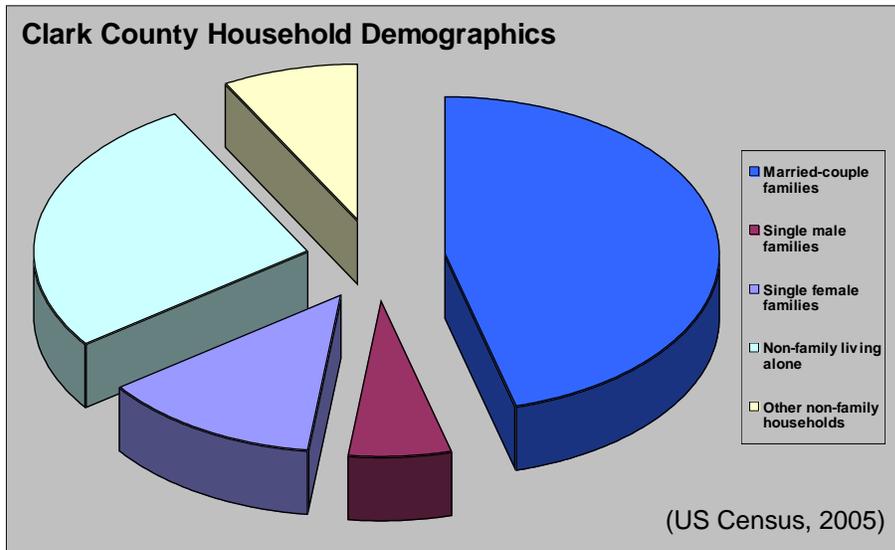


Figure 2.2 Clark County Household Demographics
 There is a large family community and significant percentage of individuals living alone.

The age demographics of Clark County indicate that 26% of the population is under the age of 18, 9% from 18 to 24, 31% from 25 to 44, 23% from 45 to 64, and 11% who were 65 years of age or older (Figure 2.3 Clark County Age Demographics). The median age was 34.4 years.

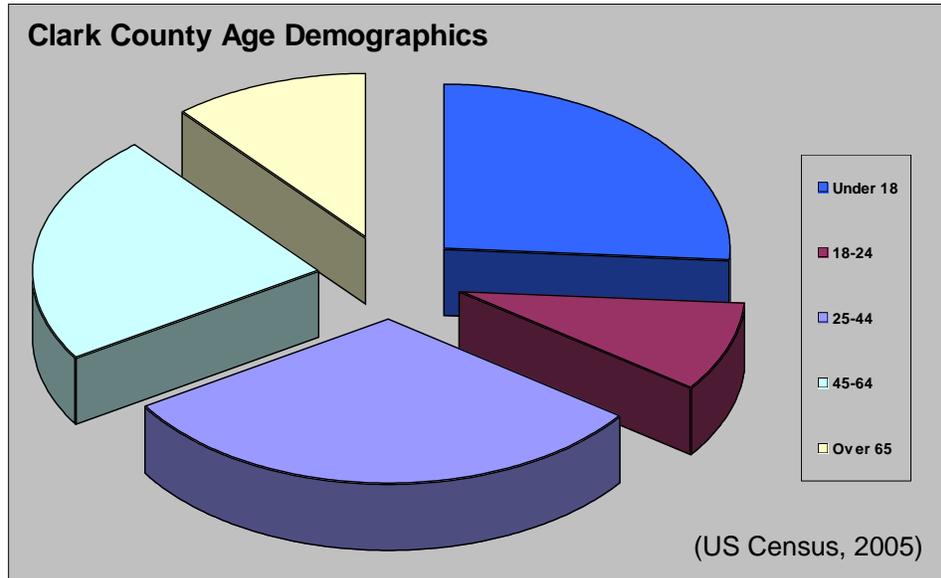


Figure 2.3 Clark County Age Demographics

There is a fairly even distribution of age groups with a slight lean towards children and 25-44 yrs which supports the large 'family' demographics below.

b. Las Vegas Demographics

Las Vegas is a census-designated place (CDP) located in Clark County, Nevada. The demographics of the city of Las Vegas represent urban Clark County.

Las Vegas is located at 36°10'34" North, 115°8'13" West (39.176, -115.137) (Wikipedia, 2007). According to the United States Census Bureau, the CDP has a total area of 340.0 km² (131.3 mi²). As of the census of 2000, there were 478,434 people, 176,750 households, and 117,538 families residing in the city. The population density was 1,630.3/km² (4,222.5/mi²). There were 190,724 housing units at an average density of 649.9/km² (1683.3/mi²) (US Census Bureau, 2000).

The racial makeup of Las Vegas in 2005 was very similar to that of Clark County: 52.3% White, 28.5% Hispanic, 11.1% African American, 0.6% Native American, 4.7% Asian, 0.4% Pacific Islander, 3.0% from two or more races (US Census Bureau, 2005).

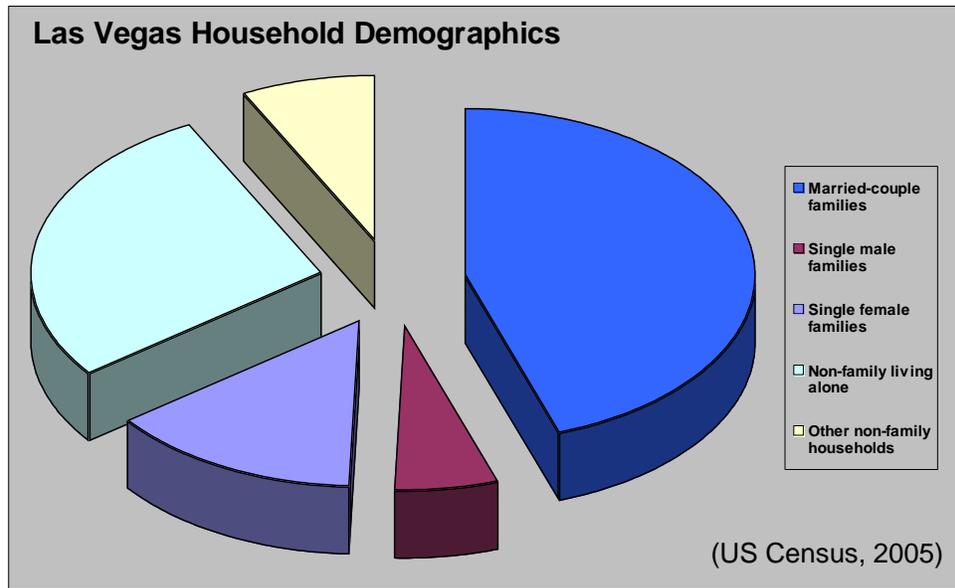


Figure 2.4 Las Vegas Household Demographics; about a third of the households in Las Vegas are non-family.

There are a slightly smaller proportion of families in the City of Las Vegas when compared to the demographics of overall Clark County. In 2005, there were 204,688 households of which 132,735 are family households (Figure 2.4 Las Vegas Household Demographics). Of the family households, 48% had children under the age of 18 living with them. Of these family households, 41,098 are single parent households with more than two times as many single female parents as male parents. There were 56,733 households made up of individuals living alone. There were 45,667 households with one or more people 65 years of age or older. The average household size was 2.63 and the average family size was 3.26 (US Census, 2005).

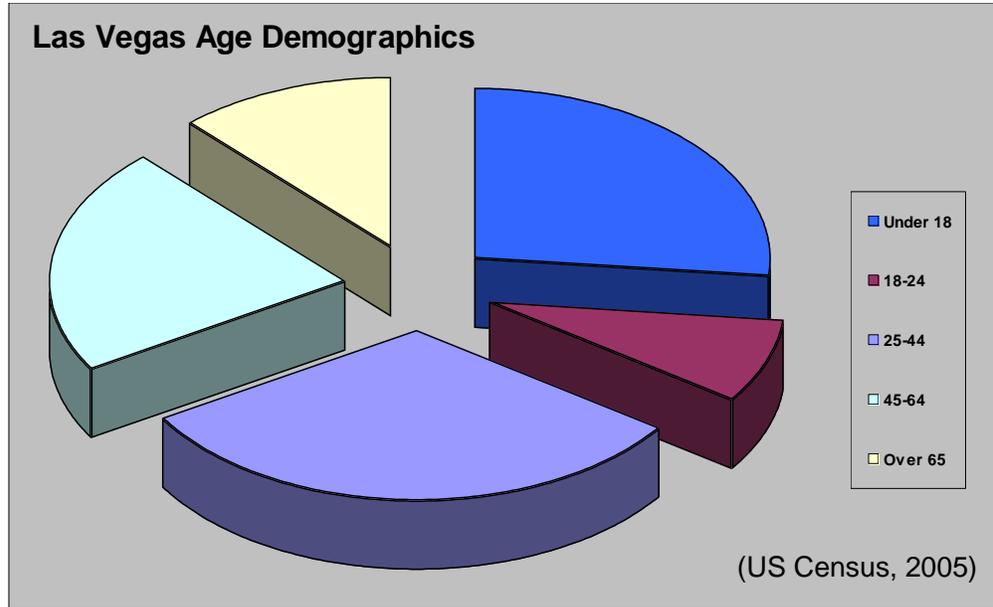


Figure 2.5 Las Vegas Age Demographics

In Las Vegas the population was spread out with 27% under the age of 18, 8% from 18 to 24, 32% from 25 to 44, 22% from 45 to 64, and 12% who were 65 years of age or older (Figure 2.5 Las Vegas Age Demographics). Las Vegas demographics show slightly larger percentage of people under the age of 18 and over 65 than Clark County. The median age was 34.8 years.

c. Moapa Valley Demographics

The City of Overton lies just under 20 miles from the park and resides in the Census Designated Place (CDP) of Moapa Valley. Census statistics also include the towns of Logandale and Moapa.

As of the 2000 census there were 5,784 people, 1,934 households, and 1,525 families residing in the CDP. Clark County’s estimate for 2008 was 7,200.

In 2005, there were 1,934 households out of which 38.8% had children under the age of 18 living with them, 69.8% were married couples living together, 6.5% had a female householder with no husband present, and 21.1% were non-families. 17.8% of all households were made up of individuals and 10.4% had someone living alone who was 65 years of age or older. The average household size was 2.99 and the average family size was 3.43.

In the CDP the population was spread out with 33.5% under the age of 18, 6.7% from 18 to 24, 23.0% from 25 to 44, 21.6% from 45 to 64, and

15.2% who were 65 years of age or older. The median age was 36 years. For every 100 females there were 101.7 males. For every 100 females age 18 and over, there were 98.2 males.

The median income for a household in the CDP was \$39,942, and the median income for a family was \$47,575. Males had a median income of \$42,348 versus \$26,442 for females. The per capita income for the CDP was \$16,696. About 5.7% of families and 6.9% of the population were below the poverty line, including 7.3% of those under age 18 and 8.3% of those age 65 or over.

The Las Vegas metropolitan region augments the population of the Moapa Valley as a bedroom community to Las Vegas. Other future development in the area such as Coyote Springs to the North appears to be increasing use of Valley of Fire State Park by regional and local users.

C. RECREATIONAL DEMAND

1. Effect of Population Increases and socioeconomics and Demand

Past rapid development in the Las Vegas, Moapa Valley and Clark County in general increases pressure on all recreation facilities in the region. Increasing populations raise demand for these facilities at all levels. City and County recreation providers continue to try to catch up and to keep pace with demand and use. Residents may apply increasing pressure on the State system to meet their needs.

The recession that began at the end of the decade has reminded recreation providers that recreation areas continue to be in high demand during economic stress. There is a "stay close to home" need with less folks traveling as far to recreation due to cost. At this point, due to demand, the Nevada Division of State Parks (NDSP) is currently upgrading old facilities and has already added and upgraded the campgrounds at Valley of Fire. The lack of projected funding for the State in the next decade demands that maintenance is critical to our parks. The increasing proximity of Las Vegas development reduces travel time to the Park, making the park more accessible and increasing demands. International visitation is also increasing and the park is currently upgrading the visitor's center to help meet those demands.

A number of data sources provide insight into the socioeconomic condition of regional residents and park visitors. This information can be used to help determine the ability of regional residents to participate in the full range of recreational activities available. The 2010 Census is getting underway and no data is available at present. The 2005 Census data for Clark County shows a slightly lower percentage of poverty level families and senior citizens than that of the rest

of the United States. The population of the area leans towards families, and therefore affordable family and group activities areas are needed. Due to this demand, Valley of Fire is adding and upgrading camping facilities and other older facilities. The Park is also upgrading the trail signage and interpretive/education signage to meet these needs.

The median income for a household in the county was \$44,616, and the median income for a family was \$50,485. Males had a median income of \$35,243 versus \$27,077 for females. The per capita income for the county was \$21,885 (U.S. Census Bureau, 2000).

The U.S. Census Bureau described the national poverty line for 2005 as an individual income of \$10,160 or less. A total of 10.8% of the Clark County population and 7.9% of Clark County families were below the poverty line which are significantly lower than the national percentages of 12.6 and 10.8. 14.1% of those under the age of 18 and 7.3% of those 65 and older in Clark County were living below the poverty line (U.S. Census Bureau, 2000). According to Clark County data, the poverty rate in Clark County, Nevada has increased by 0.4 percent from the levels reported in the Decennial Census of 2000, moving from 10.8 percent to 11.2 percent in 2006.

2. Visitation Characteristics

Overall visitation to all Nevada State Parks has gradually increased between 1990 and 2008 with relatively smaller fluctuations. Following its peak of 3,472,248 visitors in 2000, overall visitation leveled off in the last few years at approximately 3,200,000 visitors, which is larger than the mean of 3,165,657.

3. Activity Preferences and Demand

The 2009 NDSP Statewide Visitor Survey Report listed the following outdoor activities as being the most popular in NV State Parks based on participation: relaxing outdoors, walking, both vehicle camping and tent camping, picnicking and hiking. Water-based activities are the most popular where water bodies and fishable streams are available. Past surveys from the 2003 Statewide Comprehensive Recreation Plan and the 2005 Nevada Trails Plan resulted in similar preferences: pleasure driving, picnicking, walking, wildlife viewing, and hiking. The trails plan brought forth biking and OHV use as two of the addition top five trail uses.

The Nevada 2005 State Recreational Trail Plan Survey information on demands for trail activities was a statewide random sample of trail users was asked to select the activities that they engaged in during the twelve months preceding the survey. The percentage is of total survey respondents who indicated participation in each

trail activity. Respondents could pick more than one activity; therefore, the sum of the percentages is greater than one hundred.

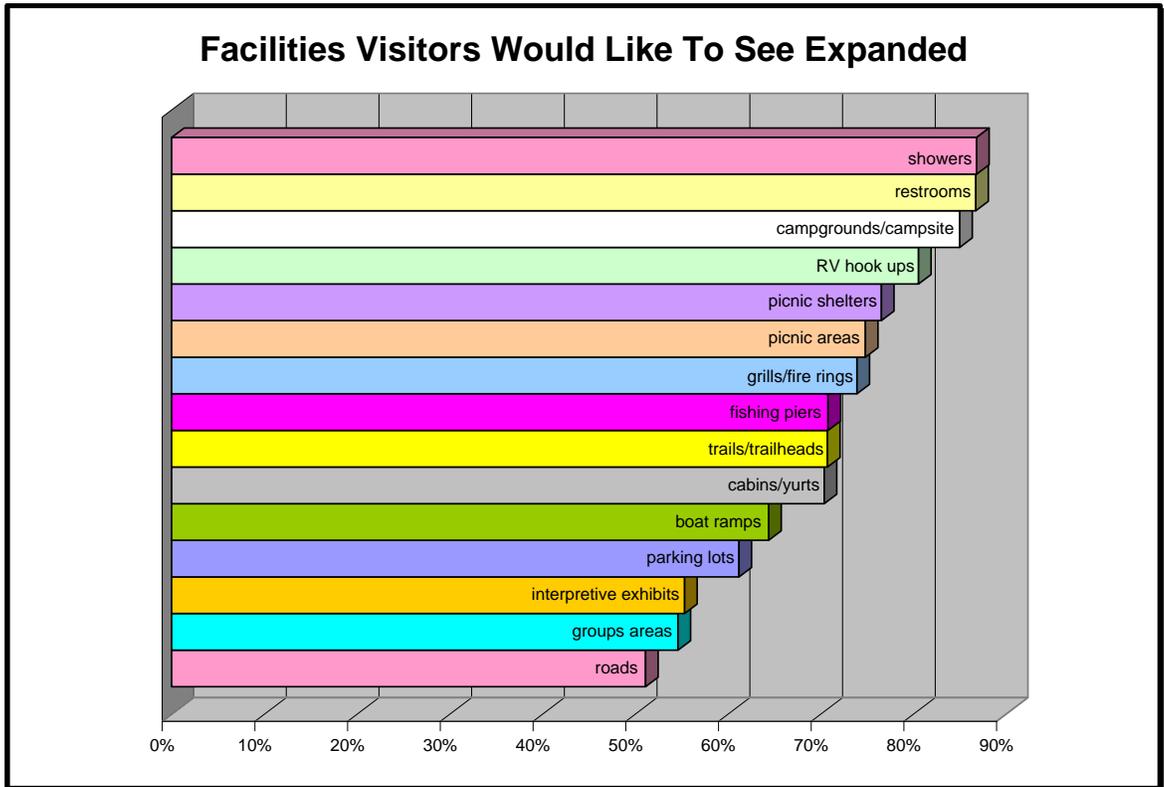


Figure 2.6 2009 Statewide Survey

Applying 2009 Statewide and regional data to Valley of Fire we can see that users are asking for renovated or updated facilities that provide for highly developed camping, picnicking, family gathering, hiking, scenic views photography and visiting historical, paleontological and archaeological sites.

Valley of Fire surveys indicated a demand for more interpretation and protection of the Paleolithic sites and better signage for all trails. Users of the backcountry on the Logandale trails system asked for better signage on the trails and for the Park to consider the possibility of a dry campground for OHV/ATV's in the north end of the park. Separation of the generator vs. non generator campers is a continuing issue.

D. RECREATIONAL SUPPLY

1. Valley Of Fire

Valley of Fire State Park provides the park visitors with the opportunity to escape the urban pace of Las Vegas and enjoy the unrestrained beauty of the Mojave

Desert. Developed activities include camping, group camping, individual family and group picnicking, an events center, guided historic and nature tours, wildlife and nature viewing, and historic interpretation.

a. Family Picnic and Group Use Areas

Shaded picnic areas with restrooms are located at Atlatl Rock, Seven Sisters, the Cabins, near Mouse's Tank trail head and White Domes. There are three group areas, accommodating up to 45 persons. They are available for overnight camping and picnicking by reservation only.

b. Visitor Center

The visitor center provides exhibits on the geology, ecology, prehistory, and history of the park and the nearby region. A gift shop is located within as well as restrooms and refreshments. The staff offices are located behind the visitor's center.

c. Historic Attractions

Petroglyphs and other Native American points of interest like Mouse's Tanks offer visitors a view into the past of a people who first made the Desert their home. The CCC Cabin site and the Historic Arrowhead Trail and other historic markers provide historic sites for the public.

d. Camping

Two campgrounds with RV hookup sites, and three walk-in camp sites. Campsites are equipped with shaded tables, grills, water, and restrooms. Dumpsites and showers are also available.

e. Trails, Access and Regional Connectivity

Walking and hiking are popular activities for people visiting Valley of Fire. The park has 16 trails ranging from .1 mile to 6.8 miles in length. There is currently 24.9 miles of trail in the park. This includes sections of the Logandale trail which crosses into the north end of the park in several places. Connectivity outside the park is limited to the Logandale trails system. There is opportunity to create connectivity with the Moapa Valley Trails plan, the City of Overton and Clark County in the future in the north end of the park for non-motorized and motorized uses as the Moapa Valley trails and open space plans are completed. See Chapter 3 for details on each trail (Attachment 3.10 Circulation Map; 3.11 Core Trails Map; and 3.12 Motorized Trails Map).

2. Regional Facilities

Other State Parks in the region are Spring Mountain Ranch and the Old Las Vegas/Mormon Fort. The Lost City Museum in Overton offers fine displays of Indian artifacts and reconstruction's of the original pit dwellings and pueblo found in the Moapa Valley. The Lake Mead National Recreation area is six miles away and offers a myriad of water based recreation opportunities. Other public recreation providers in the region include the incorporated cities of Las Vegas, North Las Vegas, Henderson, Boulder City, Pahrump, Blue Diamond, and Clark County. Typical urban facilities provided by these groups include swimming pools, ball fields, tennis courts, playgrounds, open multi-use turf areas, golf courses, and picnicking sites.

The federal government actively manages recreation areas in the region also. These include the U.S. Fish and Wildlife Service at the Desert National Wildlife Refuge, the National Park Service at Lake Mead National Recreation Area, the United States Forest Service at Mt. Charleston, and of course, the Bureau of Land Management in the Red Rock Canyon National Conservation Area. Picnicking, boating, swimming, hiking, mountain climbing, hunting and other backcountry experiences are examples of activities available in these areas.

E. REGIONAL LAND USE TRENDS

1. Ownership and Land Use

The Park boundary consists of two large areas separated by BLM and private lands. Lands administered by the U.S. Bureau of Land Management border the park on the west, north and south. Lake Mead National Recreation Area, administered by the National Park Service, lies directly east of the park. The park is also bordered by lands managed by the Bureau of Reclamation and private property owners. (Appendix 1.2 Land Ownership Map)

2. Patterns and Trends.

Since 1980, the park has grown to encompass over 35,300 acres (Appendix 1.3 Park Acquisition History Map). Land use surrounding the park is all outdoor recreation. In cooperating with the Clark County and the Moapa Valley trails and open space plans meetings and with the NPS and BLM in this process, there are no plans for changing any of these lands to non-outdoor recreation use. Plans include collaborative trail building and cooperation in management of the motorized trail system in the north.

3. Zoning

The park lies within the Northeast Planning Area for Clark County. The park is within the Public Facilities and rural open land districts. Therefore the park is in compliance with County zoning and no conflicts exist.

4. Existing Access

Two entry/rest stations are located at the east and west entrances into the park along State Highway 169. The main park road bisects the southern portion of the park from east to west. This main road is paved and well maintained. The second main road is the White Domes Road. There are also several secondary roads within the park including Atlatl Rock loop road, Beehives road, Cabins road that are open to the public. There are other tertiary roads for staff use only (Attachment 3.10 Circulation Map).

There is a third heavily used entry point at the Logandale Trails area through the BLM lands on the north end of the park (Attachment 3.10 Circulation Map and 3.12 Motorized Trails Map). The park also has a number of unofficial access points which are found mostly in the northern portion of the site. Most of these access points require 4WD vehicles and are difficult to traverse due to constant wash outs.

F. SUPPLY/DEMAND ANALYSIS

A supply demand analysis using uncertain demand and demographic data is difficult. However, the future of the State of Nevada, Division of State Parks General Fund Budget future which supports maintenance and operations is anticipated to be inadequate. It is anticipated that demand may increase while supply is going to remain constant, and operating and maintenance budgets will likely decrease.

Economists are estimating that the State of Nevada Government budget and the economy may take a decade to recover. The same is being said for the nation. Worldwide impacts cannot be estimated at this point either. Because of this, it is only prudent to focus on maintaining current facilities as the priority of this plan.

The National Parks Service Newsletter, January 2010, *The Connections* included an article from Rick Potts, Chief, NPS Conservation & Outdoor Recreation Division. In it he explained best a problem with nationwide park implications, including Valley of Fire: "You cannot love a park to death. When a special place has a constituency of people who personally know and experience it, their love of that place rises up to protect it when it is threatened. When people know and love a place, they protect it. For all their importance, physical connections between parks and the land or communities near them are not enough to protect the parks. Parks also need deep connections with the hearts of people all around them. Although love cannot kill an area, apathy and irrelevance surely can."

During 2009, the park saw a visitation increase of over 16% and set an all-time record number of visitors at 1,519,732. Therefore, we must anticipate continued increasing visitation impact and demand. The facilities, natural beauty and valuable archaeological resources within the park are the features that draw the users. Therefore, their upkeep, maintenance and protection will hold priority over that of redevelopment or new facilities.



III. THE EXISTING PARK

A. NATURAL RESOURCES

1. Physiography/Slopes

Valley of Fire State Park is located approximately 60 miles northeast of Las Vegas, Nevada in Clark Co. It lies in the Basin & Range physiographic province, with typical north-south trending valleys and ridges. The park possesses a series of rock formations which are unique to the basin area. The elevations of the park range from a low point of 1320 and climb to an elevation of 3009 feet.

Valley of Fire lies in the Muddy Valley and lies to the west of the Overton Arm of Lake Mead. The dominant Muddy Mountains lie to the south of the park boundary and rise to an elevation of 5363 feet at Muddy Mountain. The Muddy Valley along with the Virgin Valley is unique for Clark County in that it does not contain a central basin. These valleys drain into the Colorado River and are the only open drained basins in Clark Co. Two parallel ridges lie to the west of the park. These ridges are known as the Weiser Ridge and the North Muddy Mountains.

Slopes range in the park from near level to near vertical relief. In some areas overhangs and land bridges are common. Limestone formations are often moderately high, steeply sloping ridges which are grey in color. The less resistant sandstone formations form low ridges or valleys; these units form the spectacular displays of color and interesting erosional features (See Appendix 3.1 Slope Map). The most striking formations are located within the core of the park and to the north. Visitor use areas are typically flat except in trail areas.

2. Climate

a. Temperature

The park has predominately two seasons of summer and winter. Fall and spring are typically very short compared to areas in the north and north central portion of the state. The park's location in the low-latitude desert is characterized by mild winters and hot summers. The southern subtropical desert region averages 20 degrees (F) warmer than areas in the northern portion of the state. Approximately half of this variation is due to latitude and the other half to elevation. Winters in the park may be cool but a zero degree (F) temperature has never been recorded. Summers in the park are very hot with a July mean temperature of 90 degrees (F) and daily highs well over 100 degrees (F). The highest temperature set in Nevada of 122 degrees (F) was recorded on June 23, 1954 near the park in Overton, NV.

As in many desert areas where clear skies exist, there is usually a large variation in temperatures from day to night. In the park that range can reach as high as 24.4 degrees (F) in July.

b. Precipitation

Rainfall within the park is slight as is typical to most low lying southern deserts. The occurrence of rain within the park is infrequent with the majority of precipitation occurring in the winter months. Summer rains are in the form of highly localized thunder showers which may offer rain to portions of the park while leaving other areas dry.

Due to the topography of the rock formations and soil characteristics, there is a high potential for flash floods. Flash floods may occur with even moderate rainfalls within the park. During flash floods erosion and silt damage may also occur. The largest recorded rainfall at the park was 2.36 inches in November of 1987.

c. Solar and Wind

The park is in full sun approximately 83% of the time which makes it one of the sunniest locations in the country. June and September have full sun for 92% of the month. The least sunny month at the park is December which is sunny 73% of the month (Houghton, Sakamoto, Gifford, 1975).

Surface winds in Nevada are governed primarily by the prevailing storm tracks and the basin-range topography. The highest wind speeds are generally recorded in May in the extreme southern portion of the state. The average high wind speed is 10.9 MPH. The lowest average wind speeds are recorded in November and December, 6.8 MPH.

The prevailing wind direction is southwesterly from February through September and changes to westerly from October through January. The diurnal effects of wind result in calm morning winds with winds picking up in the afternoon.

3. Geology of the Area

The geologic evolution of Valley of Fire dates well into prehistory. The Cambrian period, 500 to 600 million years ago, provides a good starting point for the explanation of its unique geology. During the Cambrian period a large inland sea covered all of the Great Basin, leaving a thick deposit of limestone. Located above these formations were the deposits of red Kaibab limestone of the Permian period, which ended approximately 200 million years ago.

The visible geology of the park began with the Triassic period. Sediments including shale, sandstone, gypsum and marine deposits were known as the Moenkopi formation. These sediments were washed down from surrounding uplift areas to form layers called Shinarump Conglomerate. This layer was formed in the late Triassic period and after they were formed a layer of Chinle shales were deposited above them.

Along the park borders, many petrified logs can be found and are a result of the extruded conglomerate. These petrified logs are the fossilized remains of a long extinct pine like conifer.

During the Jurassic period, from 135 to 180 million years ago, most of the region underwent a period of drying. These desert-like conditions are evidenced by the thick layer of sandstone which was cross bedded by wind driven particles. The bright, brick-red layers are what give the park its unique core. This Aztec Sandstone is exhibited in low, rugged, lowland belts. As the formations are followed from the north boundary they bend to the southeast and east in response to the anticlinal uplift directly north of the Arrowhead fault. The anticline is broken by faults which cause irregularities in outcrops. The most striking natural formations are located on the north limb of this structure.

Above the Aztec Sandstone that borders the park are thick Cretaceous deposits, made of conglomerate, sandstone, clay, and volcanic ash. The deposits were laid down after the initial disturbance of the older rocks but the Cretaceous beds were in turn highly tilted, and in a local area they were overridden by a plate of Aztec Sandstone (Longwell, Pampeyan, Bowyer, and Roberts, 1965).

Mountain-building occurred after the Jurassic period and eventually created the Muddy Mountains. Materials which were displaced and relocated by water went to the formation of the Baseline and Willow Tank formations located in the eastern part of the park.



Seven Sisters

In the early Cenozoic times about 70 million years ago, major uplifting, folding, and faulting resulted in the Willow Tank Thrust and the Glendale Thrust. The Glendale Thrust resulted in the highlands which were eroded on one side to produce huge alluvial fans. This produced the Overton Flaglomerate which is now displayed by the steeply tilted ridges along the park's eastern boundaries. From this point on, the primary geologic process at work in the valley has been erosion. Extremely low rainfall is typical to the area, however, even this small amount of rainfall over the millions of years has stripped off most of the upper layers from the Glendale highland and has cut deep canyons in the Aztec Sandstone. Along with the action of erosion, wind also has scoured the exposed walls of buttes and canyons, pockmarking and gouging them into strange textures and unusual shapes.

(Appendix 3.2 Geology Map)

4. Soils

a. Description

Valley of Fire falls into a mapping unit known as a Bard-Colorock-Tonapah. This unit covers the entire site and is moderately deep and deep, well drained and excessively drained. The land is near level to strongly sloping on broad alluvial fans and old terraces. This map unit consists of large areas characterized by mountain ranges and by depressional areas consisting of drainage ways through mountains. Bard soils make up 36% of the unit and Tonopah soils about 10%. Arizo, Arrolime, Cave, St. Thomas, and Badland make up the remaining 30%.

The Bard soils are found on old terraces and alluvial fans. These are shallow, have indurated, lime-cemented hard pan. These soils are well drained and are gently to strongly sloping. The surface layer is pink gravelly fine sandy loam about 5 inches in depth. The underlying material is pink sandy loam about 14 inches thick over an indurated, lime-cemented hardpan about 27 inches in depth. This layer overlies a light grey very gravelly sandy loam that extends to a depth of 60 inches or more. The vegetation which is supported by this soil type include; creosote bush, white bursage, cholla and other cacti, and annuals.

Colorock soils are typically located on smooth, broad alluvial fans. These soils are generally shallow over hard pan. They are well drained and gently sloping to moderately sloping. A 3 inch layer of pink very gravelly clay loam make up the upper portion of the profile. The next layer is a

pink very gravelly sandy loam about 12 inches in depth. Below this is an indurated, lime-cemented hardpan about 27 inches thick over light grey very gravelly sandy loam that extends to a depth of 60 inches or more. The vegetation on these soils is mainly creosote bush, white bursage, cacti, and annuals.

Tonopah soils are alluvial fans and terraces. These soils are deep, somewhat extensively drained, and nearly level to strongly sloping. The surface layer is light brown gravelly sand loam about 6 inches in depth. The underlying material is light brown very gravelly sand and extends to a depth of 60 inches. These soils host several plants including; creosote bush, white bursage, and annuals (Soil Conservation Service, Virgin River Area, 1980).

Another soil survey was completed in 1985 which covers the entire park boundary (Appendix 3.3 Soils Map). This survey was done by the Bureau of Land Management as part of an Oil and Gas Leasing Environmental Assessment. This survey of soil associations generally parallels the SCS survey in many areas especially those containing the Badland and Rock Outcrops units. The major differences occur within the valley itself which exhibits a far greater degree of alluvial fan soils. These soil associations include Weiser-Cave-Arizo, Weiser-Isom, Tencee-Weiser-Normud, Canutio-Elvada, and Canutio-Nickel-Cajon. These associations dominate the southern portion of the park and are considered deep, well drained soils occurring on alluvial fans (Valley of Fire, Environmental Assessment, 1985).

b. Soils Constraints

These soil units are not suited for crops and have only limited uses for livestock grazing. They provide limited food, water, and cover for wild-life species that normally inhabit the area. The location of facilities should avoid obvious dry washes and other drainage ways. These areas can be very erosive during localized heavy thunder storms (See Appendix 3.4 Soils Map).

5. Water Resources

a. Watershed/Streams

Most of the normal runoff in the Valley of Fire follows moderate to heavy rain which occurs on a sporadic basis and follows dry washes. The largest of these dry washes, Valley of Fire Wash, occurs in the southern part of the park and roughly parallels the main road from west to east. Another major wash, Overton Wash, occurs in the northern reaches of the

park and runs from the southern edge of the Weiser Ridge to the Overton. In addition to these two main washes there are several secondary washes which also are prominent in the park, such as the Fire Canyon, Kaolin, Magnesite, Wieber, and Logan Washes. As with the other main washes these washes also run west to east where they eventually tie into the Overton Arm of Lake Mead.

Typical of all desert areas with extremes of topography, runoff occurs rapidly in the form of flash floods as soils typically are non-permeable. The park contains no permanent, free-flowing streams within its boundaries. (Appendix 3.5 Hydrology Map)

There are only three small springs located in the park. They are all low volume springs with little to no runoff. These springs are Charlie's spring, another just east of it in same wash, and one in Magnesite wash.

b. Water Rights

There are no known surface water rights in the park. There is one operating well with underground rights located at Atlatl Rock dump station. There are underground water rights at the reverse osmosis plant to be moved to the well in the future.

6. Park Ecology

a. Communities/Vegetation Types

Valley of Fire State Park, with its location near the borders of Nevada, Utah and Arizona, lies in a broad transition corridor between Mojave and Great Basin Deserts. There are a large number of native species of shrubs, grasses, cacti, and wildflower/annuals which occur in the Muddy Mountains and surrounding valleys.

Patterns of association within the park and the adjacent Muddy Mountains are complex, reflecting the effects of climate, substrate, and physiography. This highly varied geology, elevation and soils results in a large diversity of plants in what at first glance would be considered a desolate desert landscape.

Community Types as described by the EPA Southwest Re-Gap database for Clark County include:

- Inter-Mt. Basins Semi Desert Shrub Steppe.
- Mojave Mid-Elevation Mixed Desert Scrub.

- North American Warm Desert: Badland, Bedrock Cliff and Outcrop, Pavement, Playa, Riparian Mesquite Bosque, Riparian Woodland and Shrubland, and Desert Wash.
 - Sonora-Mohave Creosote bush-White Bursage Desert Scrub
 - Sonora-Mohave Mixed Salt Desert Scrub.
- (Appendix 3.5 Vegetative Communities Map)

B. Clark County Multiple Species Habitat Conservation Plan

The Nevada Division of State Parks, as a partner in the **Clark County Multiple Species Habitat Conservation Plan** (MSHCP), has agreed to implement a total of approximately 650 specific conservation measures. The conservation measures include:

- Public information and involvement
- Research
- Inventory
- Monitoring
- Protective measures
- Restoration and enhancement measures
- Land use policies and actions

The MSHCP incorporates agreements such as the Spring Mountains National Recreation Area Conservation Agreement, the Blue Diamond Cholla Conservation Agreement, the Las Vegas Bear poppy Memorandum of Agreement, and existing general management plans and land use plans and the recently approved BLM Las Vegas Resource Management Plan.

The MSHCP provided a landscape-scale perspective for addressing the conservation needs of plant and wildlife species in the park and the habitats upon which they depend. In order to implement an ecosystem-based approach to the conservation of biological resources in the Park, the plan area was organized by elevation and range into ecological zones and ecosystem types:

ECOSYSTEM TYPE (MSHCP)
Alpine
Bristlecone Pine
Mixed Conifer (White Fir, Ponderosa Pine, Ponderosa Pine/Mountain Shrub)
Pinyon-Juniper (Mountain Shrub, Pinyon Pine, Pinyon Juniper, Juniper)
Sagebrush (Sagebrush and Sagebrush/Perennial Grasslands)
Blackbrush (Blackbrush and Hopsage)
Salt Desert Scrub
Mojave Desert Scrub (Creosote-Bursage and Mojave Mixed Scrub)
Mesquite/Catclaw

Desert Riparian/Aquatic (Lowland Riparian, including Muddy and Virgin River systems and Las Vegas Wash)
Springs
Other (sand dune, gypsiferous soil, rock outcrop, dry lake bed and playa, barren, agriculture, non-native grassland, urban)

The MSHCP recommended that recreational land management decisions and mitigation be based on each habitat and its associated species needs. In addition to these major ecosystems that occur in the Park, several other assemblages of species with shared characteristics or habitat requirements may not be adequately addressed at the ecosystem level (as defined in the MSHCP). These include bats, Mojave desert lizards and snakes, butterflies, and species associated with rock outcrops, boulder fields, lava flows, sand dunes, gypsum soils, dry lake beds and playas, and boreal islands.

Based on the criteria and analyses detailed in the MSHCP, for the entire Clark County area, there were 79 species included as Covered Species. Another 103 species are listed as Evaluation Species and 51 as Watch List Species. The general measurable biological goals for all species during Phase 1 of the MSHCP that are applicable to master planning for the Park are to manage the resource to allow for no net unmitigated loss or fragmentation of habitat and therefore maintain stable or increasing population numbers.

Review of Valley of Fire State Park, by Nevada Natural Heritage resulted in the following habitats and/or species protected by Federal or State Law that will be considered in this planning document.

c. Rare, Threatened or Endangered Plants

With such a large and diverse park, the site is host for many uncommon and rare plants. These plants are found in very specific locations which are determined by a combination of soils, temperature, orientation and other physical factors which provide a very specialized growing environment. The following species were provided by Nevada Natural Heritage as At Risk Taxa Recorded near the Valley of Fire State Park Project Area. The list was compiled by the Nevada Natural Heritage Program for the Nevada Division of State Parks, May 2007. Note that all cacti, yuccas, and Christmas trees are protected by Nevada state law (NRS 527.060-.120), including taxa not tracked by this office.

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
Plants	
<i>Astragalus geyeri var. triquetrus,</i>	Three corner milkvetch
<i>Arctomecon californica</i>	Las Vegas bearpoppy

<i>Enceliopsis argophylla</i>	silverleaf sunray
<i>Helianthus deserticola</i>	dune sunflower
<i>Pediomelum castoreum</i>	Beaver Dam breadroot
<i>Penstemon bicolor ssp. roseus</i>	rosy two-tone beardtongue
<i>Perityle intricata</i>	desert rockdaisy

d. Rare, Threatened or Endangered Animals

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
Invertebrates	
<i>Hesperopsis graciellae</i>	MacNeill sooty wing skipper
<i>Megandrena mentzeliae</i>	red-tailed blazing star bee
Reptiles	
<i>Sauromalus ater</i>	chuckwalla
<i>Gopherus agassizii</i>	desert tortoise (Mojave Desert pop.)
<i>Heloderma suspectum cinctum</i>	banded gila monster
Birds	
<i>Phainopepla nitens</i>	Phainopepla

Desert Tortoise: On April 2, 1990, the desert tortoise was listed as threatened by the USFWS (1990a), thereby bringing it under full protection of the Federal ESA of 1973. This listing was based on ongoing threats to the continued existence of the species, including loss of habitat to urban development and agriculture, potential degradation of habitat by grazing and off-highway vehicle (OHV) use, illegal collection, spread of an upper respiratory tract disease, excessive predation of juvenile tortoises by common ravens, and other contributing factors. The April listing was preceded by an emergency listing of the tortoise as endangered on August 4, 1989. In Nevada, the tortoise has been categorized as “protected” pursuant to Nevada Revised Statute (NRS) 501.110 and Nevada Administrative Codes (NAC) 503.080 and 503.090.

Surveys for tortoise burrows and mitigation are completed on a case by case basis upon development or change of management in the park rather than at the master plan scale.

e. Fish

There are no streams or lakes that support fish within the park. The Fairy Shrimp (*Apus Longicaudatus*) has been observed in natural water holding tanks. These natural tanks hold water sporadically depending on available rainfall.

f. Weeds and Non-Natives

There have been many plant introductions within the park boundaries. A few shade trees have been planted near the staff housing area such as Chilean Mesquite and Palo Verde. The site is also host to several non-native weed species which are distributed along existing road and disturbed areas:

SCIENTIFIC NAME	COMMON NAME
<i>(Amaranthus spp)</i>	Palmer Amaranth
<i>(Conyza canadensis)</i>	Canada Horseweed
<i>(Conyza coulteri)</i>	Coulter Horseweed
<i>(Helianthus annuus)</i>	Common Sunflower
<i>(Sonchus asper)</i>	Spinny Leaf Sow-Thistle
<i>(Capsella bursa-pastoris)</i>	Shepperd Purse
<i>(Cardaria pubescens)</i>	Whitetop (Noxious Weed)
<i>(Descurainina pinnata)</i>	Pinnate Tansy Mustard
<i>(Descurainina sophia)</i>	Flixweed
<i>(Malcolmia africana)</i>	African Malcomia
<i>(Streptanthella longirostris)</i>	Long Beak Twistflower
<i>(Atriplex semibaccata)</i>	Australian Saltbrush
<i>(Salsola paulsenii)</i>	Barbwire Russia Thistle
<i>(Melilotus indicus)</i>	Indian Sweetclover
<i>(Malva parvifolia)</i>	Cheeseweed
<i>(Plantago lanceolata)</i>	English Plantain
<i>(Rumex crispus)</i>	Curry Leaf Dock
<i>(Bothriochloa barbinodis)</i>	Cane Beardgrass
<i>(Sorgham halepense)</i>	Johnson Grass

7. Perceptual

Scenic views abound in this park, therefore, appendix 3.8 identifies those developed viewpoints separate from the Composite analysis. This map identifies areas which offer good views and vistas. (Appendix 3.8 Developed Scenic Viewpoints Map).

a. Scenic Attributes

The name Valley of Fire comes from the intense red color of the eroding sandstone located throughout the park. The dominant red sandstone formations are located in the southern portion of the park and run east-west along the existing park road. Other isolated formations are located throughout the southern portion of the park. Another major concentration of these formations exists within the northern portion of the park. All red

rock formations are best viewed when the sun is on a low angle such as in early morning and late afternoon.

The red sandstone formations are carved into intricate patterns. Spires, serrate ridges, domes, and even anthropomorphic shapes have been carved into the sandstone by water and primarily wind. In the park area are also some mesa remnants capped with gravel. The most predominate mesa is Baseline Mesa which has a nearly flat top that extends for nearly one mile.

Valley of Fire also has a large collection of petrified wood located just east of the Beehives. Although significant, there are not many full logs but instead a large number of fragments. This area has been fenced off to prevent the public from vandalizing the site and taking home pieces of petrified wood. One prime example of a petrified log is located along the main park road and west of the Cabins road.

Along with the spectacular views of the park's natural resources, the park also contains excellent petroglyphs which have national and international significance. The park also contains significant paleontological resources to interpret and protect.

b. Location and Direction of Views

The primary views are along the existing park road. The park is accessed by two main points of entry, one each on the east and the west side. Both entrances provide excellent views of formations as the visitor travels the main park road. The eastern entrance is most striking when entered in the early morning. At this time the early morning sun strikes the formations providing the most intense color. The western entrance is best for viewing the formations in late afternoon. Views of Lake Mead are also afforded while traveling to the east along the main park road.

The park presently has two main vistas, Fire Canyon and Rainbow Vista. Fire Canyon is viewed to the south and Rainbow Vista looks out to the north. Both vistas are located near the end of the Mouse's Tank road on top of the main formations.

This analysis indicates a potential location for an additional vista located on the northwest side of the park. This vista is accessed by a paved mining road which intersects Interstate 15 northeast of the Valley of Fire exit. This vista is highly desirable due to its location on top of the Weiser Ridge, accessed from the Byron Exit off of I15. The access crosses BLM lands and coordination to gain access is needed.

The views looking to the east are expansive from Lake Mead to Rainbow Vista. This vista gives the visitor a unique view of the rugged and colorful

back country of the park. The road is presently used for mining operations and visitation is not allowed. However, the site may be of significance when the mining operations are completed.

Views are also excellent within the formations of the northern back country. These views are primarily of smaller formations with a minor vista toward the Weiser Ridge. Access to these views is through another mining road which enters the park near Logandale, NV off Highway 169. The views are excellent within the tight confines of the formations but access is difficult, requiring a 4WD vehicle.

Undesirable views within the park consist of road clearing scars in several locations, views of active mining claims, and existing structures within the park's residential area. The site is so large and remote that it has not been severely impacted by the encroachment of man.

The southern portion of the park also offers views of interesting isolated formations. These formations include; Beehives, Atlatl Rock, Seven Sisters, and Elephant Rock.

Beehive rock is located just off the main park road near the west entrance. This formation carved into a beehive is one of the most photographed rocks within the park. Its location also makes it extremely accessible to all visitors.

Atlatl Rock is located across the main park road from the Beehives and offers excellent views of red rock formations as well as a large collection of petroglyphs.

Seven Sisters is a collection of monoliths located on the south side of the main park road near the middle of the park. These monoliths have a nearly vertical relief and are located in the valleys which enhance their unique character.

Elephant Rock is located near the east entry station and is a remarkable theriomorphic formation. The rock is not directly accessible to the main road and does require a short hike. This formation is also one of the most photographed by visitors.

An area which has been largely unexplored is the Pinnacles located near the western entrance to the park. Located in a valley just north of the park maintenance complex, the Pinnacles are very striking with their near vertical relief, red color and isolated location. These formations are surrounded by the drab grey color of the desert limestone which helps accentuate their red color. Compared to other formations within the park

the Pinnacles are not particularly large but their isolation from surrounding formations makes them particularly interesting.

Also located in the southern portion of the park, are other points of interest including the CCC cabins and petrified logs. Throughout the park are located several theriomorphic rock formations which are a favorite of visitors. These formations are extremely varied and include spires, land bridges, caves, and balancing rocks.

Proceeding northward on the Mouse's Tank Road, the visitor is taken to the top of the main formations where an interpretive trail takes them to Mouse's Tank through Petroglyph Canyon. Petroglyph Canyon is a narrow wash that contains several excellent examples of Indian petroglyphs. The interpretive trail terminates at the Mouse's Tank. The Tank is a natural basin formed out of the surrounding rock. The basin can hold water for months at a time and has other historical/cultural significance.

North of the Mouse's Tank trail are two main vista/overlooks. Rainbow Vista, which provides excellent views of multi-colored rock formations to the north, is the terminus of White Domes road. Fire Canyon is located east of Rainbow Vista and provides a colorful view to the south.

The areas north of Rainbow Vista offer exceptional views and recreational opportunities including White Domes, Duck Rock, and large expanses of red rock formations. White Domes is typified by large white dome formations and isolated canyons.

The isolation and size of the park aid in its protection from unsightly views. There are a few less attractive views located on site including the park staff residences and abandoned roadways which cut through the desert landscape. Other potentially obtrusive views such as maintenance facilities are well screened by natural formations.

c. Significant Areas Outside of Park Boundaries

There are several areas outside of the park boundaries which offer excellent views and recreational opportunities. The Lake Mead National Recreation Area lies to the south and east of the park boundary. The recreation area is expansive and offers excellent views, natural springs, boat launches, and other recreational activities. Also located near the park are two scenic areas, Arrow Canyon and the Virgin Mountains which are managed by the Bureau of Land Management.

A narrow hiking and climbing trail is located just east of the park boundary at the Overton Ridge. This wash is known as the Overton Wash

and is a major water course during rain storms. The wash bisects two huge ridges and produces an extremely narrow passage between the two. Following this wash to the west will provide views into the north central portion of the park.

Vehicular, access to this area is difficult since the existing road is washed out in several places. This road would be the only possible vehicle access to the park in the area, but the upper wash itself narrows in places to three feet. Overton Ridge and Wash are primarily located on BLM lands adjacent to the park. But, a Recreation and Public Purposes Act (R&PP) land transfer application is currently under review for the eastern portion of the park.

An excellent vista is provided at an existing mining site located in northwest portion of the park. This mining operation is accessed from I-15 via the Byron exit and is a paved road which terminates at the top of the Weiser Ridge. The mine site looks out to the east at expansive red rock formations with Lake Mead in the distance.

North of the existing park lies a huge area of red rock which is contained in another Recreation and Public Purposes application. This R&PP application contains areas of excellent scenic value. The northern red rock formations are typified by a long, continuous escarpment which runs from north to the south with a small scale interior valley. The other escarpment which frames this interior valley is located to the east but is broken in several locations and is not as unique as the western escarpment.

The interior valley offers many interesting views and recreational opportunities. A large sand dune area is located at the north end of the valley. Extremely fine sand which has a slight red to orange color predominates in the dunes area. These dunes are located in a confined area which combined with orientation and wind direction has resulted in these formations. Also located in this northern valley are several narrow canyon views, minor land bridges or windows and echo effects against the escarpment.

Proceeding south along this valley is a point of rock several hundred feet high separating the sand dune valley from the rest of the interior valley. This point is covered on its northern face by a huge wind driven sand dune. The views provided by this point are exceptional both to the north and south.

Moving southward, a series of open valleys appear with excellent views of red rock formations. At the southern end of the interior valley lies an area known as Buffington's Pocket. There is an oasis like appearance to the pocket area which is a result of an abandoned dam structure. This dam

which was originally built for water retention by ranchers has long since silted over and provides additional moisture for the desert environment.

Additional moisture has allowed the growth of cottonwood trees which are found very rarely within the park and surrounding desert. These trees, which reach an approximate height up to thirty feet, provide shade and a welcome relief from the wide open desert. The pocket also encourages the growth of grasses and shrubs which are not seen in the surrounding desert landscape. In addition to its isolated quality Buffington's Pocket also offers several notable petroglyphs.

d. Sounds, Smells, and Sources

The park is essentially free of noise pollution due to its isolation. Although Nellis Air Force Base is located 50 miles to the south, low level jet operations do not normally occur above the park. The park has helicopter tours flying overhead every evening. Offensive odors are ordinarily limited to garbage placed in garbage bins or some smells associated with the pit toilets. Both of these instances are highly localized and occur only on a sporadic basis.

e. Spatial Patterns

Two camping loops are located at Atlatl Rock in the southern part of the park. These campsites are established within the rock formations, offering a degree of privacy and sense of enclosure. There are other man-made, spatially defining, elements throughout the park including picnic shelters and shade structures. Power lines within the park are primarily below ground and do not interfere with views.

The park is defined primarily by basically two spatial types: wide open desert valley and broken rock formations. The valleys are flat with no defining vertical elements. In contrast, the rock formations offer a variety of enclosures and vertical scale. The sense of enclosure changes from "canyon like" to small scale with vertical sheer walls. Fire Canyon is an excellent example of the "canyon like" spatial pattern.

Petroglyph Canyon, which leads to Mouse's Tank, runs along a dry wash which exhibits the vertical sheer walls typical of a small scale enclosure. These spaces defined by the formations provide a stark contrast to the wide open spaces of the valleys.

B. CULTURAL RESOURCES

1. ARCHAEOLOGICAL and PALEONTOLOGICAL

The major users of the Valley of Fire area were the people of the Lost City. The Lost City was an enormous cluster of pit houses and pueblo villages which were located along the flood plain of the Muddy River, running east of the park. These Lost City residents (300 B.C. to 500 A.D.) used the valley primarily for hunting wild game with darts and atlatl. The Indians also would gather wild seeds from the park area. It is doubtful that any permanent residences were established within the valley due to its lack of water. This period of Lost City occupation by the Anasazi is called the Moapa Phase and is along the same period as the Basket maker II Period in Arizona and New Mexico.

The succeeding period (500 to 700 A.D.) was known as the Muddy River Phase. During this phase the pit house dwellers gathered to form small villages where the inhabitants grew crops of corn and squash. During this period clay pottery was also being made.

The Lost City Phase (700 to 1100 A.D.) was the next major phase which saw the river village grow enormously. The inhabitants moved from thatched pit houses into surface pueblos made of adobe and stone. The Indians also at this time exploited the mineral resources of the area including salt and turquoise. During this Lost City Phase the Southern Paiute began to filter into Lost City territory.

The final period, Mesa House Period (1100 to 1150 A.D.) was very brief and populations dwindled as they moved to high ridges away from the river. The Anasazi finally abandoned the area to the Southern Paiute.

Although no permanent pit houses have ever been located, several rock shelters show usage as temporary shelter during hunting forays into the park. Within the natural rock shelters artifacts such as pottery shards, projectile points, stone tools, and petroglyphs have been discovered. Pictographs are found at only one rock shelter within the park.

By far the most striking archaeological finds have been the number and quality of petroglyphs throughout the park. One the best and largest examples of petroglyphs are found at Atlatl Rock. Both geometric and naturalistic designs are found within the park.



The geometric designs include: straight lines, rectangles, zig zag lines, cross-hatching, lines with pendant triangles, crosses, concentric crosses, stars, rakes, gridirons, circles, concentric circles, connected circles, dots, rows of dots, spirals, sundisks, wavy lines, and mazes.

The naturalistic designs are both anthropomorphic and theriomorphic and included: hand and foot prints, human figures, rows of human figures with joined hands, mountain sheep, birds, lizards, snakes, and centipedes. The most popular naturalistic designs were humans and mountain sheep.

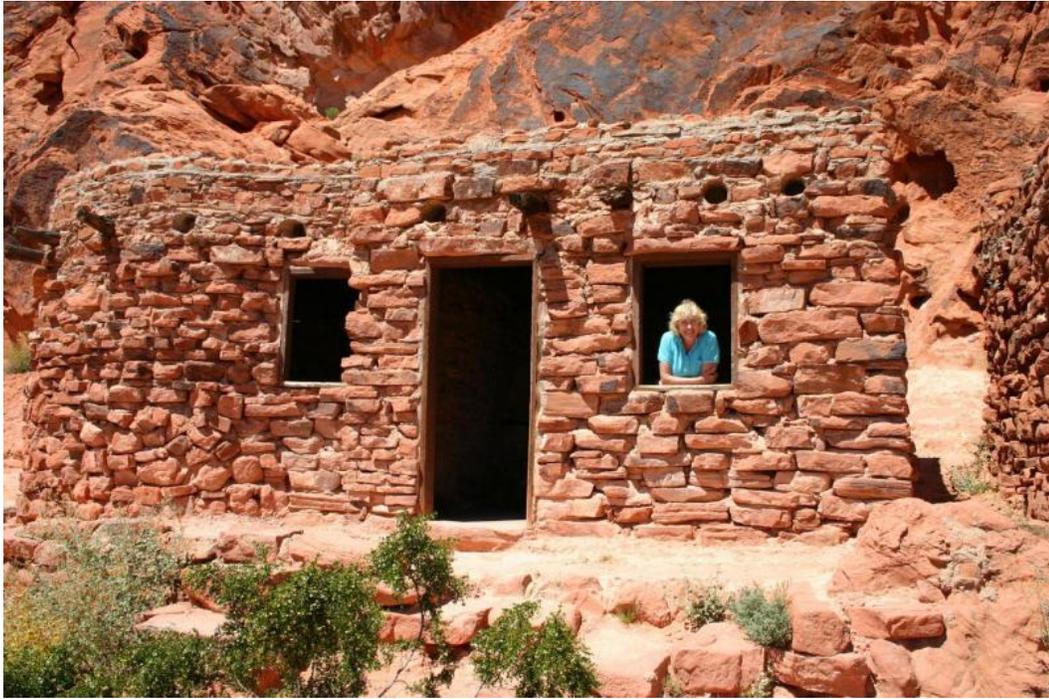
The meaning of these designs is not fully understood, however it is not considered a written language. Some of the drawings may represent aboriginal doodling while others may have had important ceremonial significance. Many primitive hunters practice imitative magic by drawing the animals they wish to kill. The carvings are also believed to represent various clans within the Indians society.

Of the 18 sites with petroglyphs, 10 sites have groups of outstanding petroglyphs. These petroglyphs are outstanding as to their form, number and variety. There are six Petroglyph sites which are considered exceptional. The petroglyphs at all the sites are slowly eroding away as the so-called desert varnish is shaling and falling off. Measures must be taken to save these carvings from natural forces as well as vandals. Continued partnerships in surveying, research and protection consulting with organization and institutions such as Dr. Kevin Rafferty, Department of Human Behavior, College of Southern Nevada is crucial to protection of these resources.

2. HISTORICAL

Valley of Fire does not contain a significant wealth of old or historical structures. However, there are several historical elements which should be included in the resource inventory.

The Valley of Fire became a wagon road cutoff to Las Vegas in the latter part of the 19th century and early 20th century. In 1914 Clark County built a dirt road through the Valley to serve as part of the Arrowhead Trail between Salt Lake City and Los Angeles. Portions of this road still exist within the park boundaries. The Route was abandoned in 1925 when a more northerly route was established along present day Interstate 15. Before the trail was abandoned, an official of the American Automobile Association named the Valley after seeing it near sunset ablaze with red orange color.



CCC “The Cabins”

The Civilian Conservation Corps (CCC) constructed roads and buildings within the Valley from 1933 to 1935. Their work remains today in the form of the stone shelters known as "The Cabins". These structures are the only standing historic structures within the park.

C. SITE ANALYSIS MAP/SUMMARY

The Composite Site Analysis indicates the constraints and opportunities available within the park. The Composite Site Analysis also indicates areas which are and

are not suitable for development. The determining factors for restrictive development are:

- Slope and Soils (Appendix 3.1 and 3.3)
- Soils Constraints (Appendix 3.5)
- USDA NRCS Soils database (online)
- FEMA flood and stream data (online)

(See Appendix 3.8 Composite Site Analysis Map)

a. Site Limitations

Most site limitations are in the high slope and highly erosive areas of the park. These same areas provide the geological features and views which draw visitors to the park (Appendix 3.8 Composite Site Analysis).

b. Development Opportunities

The lower elevation and lower slope areas that make up the core development area of the current park can be seen on the map in Appendix 3.8. There are areas within the core that have slight limitations for all types of soil disturbing uses. However, there are adjacent areas that are slightly more fragile that should be avoided when placing facilities, trails or campgrounds.” (Appendix 3.7 Composite Site Analysis).

D. Existing Facilities and Use

The existing facilities at Valley of Fire State Park consist of two campground loops, restrooms, picnic sites, group use areas, an interpretive trail, scenic overlooks, a trailer dump station, entry stations, and visitor center. The park also has staff facilities including residences, a maintenance shop, and offices. The following is a more detailed inventory of these facilities and comments concerning their use (See Appendix 3.9 Facilities Map).

1. Camping

The camping facilities consist of two campgrounds. Atlatl Rock Campground has 20 RV sites w/ water & electrical hook-ups, 18 vehicle sites and 3 walk-in sites. These sites are serviced by two plumbed restrooms. One restroom contains showers and the other is a restroom only.

Arch Rock Campground contains 29 vehicle sites with two restrooms. The restrooms in loop "B" contain no shower facilities and are pit/vault toilets. A trailer dump station services both loops and is located near the entrance to Atlatl Rock Campground.

2. Picnicking and Day Use

Picnic sites are located throughout the park's main core and contain various amenities. Atlatl contains 2 sites with approximately 14 tables, two shade structures, and one pit/vault restroom.

White Dome's road, at Rainbow Vista turnoff, has one site with 4 picnic tables, one restroom and no shade structures. Also located on White Dome's road is the Mouse's Tank picnic area with 12 tables, one shade structure and pit/vault restrooms. A small picnic area with a shade structure and a pit/vault restroom is located at the White Dome's trailhead.

The Cabin area contains one picnic site with a shade structure and pit/vault toilet. Seven Sisters, located just west of the Cabins, has 2 main sites and 6 secondary picnic areas. There are 5 shade structures and one pit/vault toilet.

The Beehives is the only group day use area within the park. This area contains 3 group sites which each have their own pit/toilet restroom, fire ring, outdoor kitchen, and large shade structure with approximately 6 tables. All three group use sites will accommodate from 12 - 15 vehicles each. (Appendix 3.8 Facilities).

Picnic Site	Parking/ADA	Picnic Shelters	Restroom
Cabins	X	X	X
Seven Sisters	X	X	X
Atlatl	X	X	X
Arch Rock Campground	X	X	X
Beehives (Group Use reservation only)	X	X	X

3. Visitor Center/Offices

A modern visitor center is located at the foot of Mouse's Tank/White Domes Road. The visitor center has recently been renovated and a newly designed interpretive display is under construction. The visitor center offers flush restrooms, drinking water, and a retail sales area. The park staff office is located behind the Visitors Center and was completed in 2009.

4. Maintenance Shop

The maintenance shop is located near the west entrance to the park and accessed off of the main park road. The maintenance area is well sited with a natural screen provided by a ridge. The maintenance facility includes an office, service bay, wood working shop, and restroom. The maintenance contains fuel pumps and a dry storage shed.

5. Staff Residences

Park staff housing is located near the park's west entrance and shares an access road with the maintenance shop. There are a total of five houses for full time staff. The residences are not visually obtrusive to visitors on the main park road.

6. Roads and Circulation

The main park road bisects the southern portion of the park from east to west. This main road is paved and well maintained. There are many secondary roads within the park including White Domes road, Atlatl Rock loop road, Beehives road, Cabins road. There are a number of other roads for staff use only (Appendix 3.10 Circulation Map).

The park also has a number of unofficial access points which are found mostly in the northern portion of the site. Most of these access points require 4WD vehicles and are difficult to traverse due to constant wash outs.

Two entry/rest stations are located at the east and west entrances into the park along State Highway 169. The west entry station has a flush toilet and the east is a SST vault toilet. Both have open air pavilions which contains interpretive plaques. The west entry station has a fee/information booth, the east does not. The east entry station also serves as the trailhead for the Arrowhead to Elephant Rock loop trails. There is a third entry point at the Logandale Trails area through the BLM lands on the north end of the park (Attachment 3.10 Circulation Map and 3.12 Logandale Trails System Map).

TRAILS: Since the 1990 plan, there have been a total of 16 trails and routes developed. Some of these trails have informal parking areas with no trailhead facilities. Some trails have development of facilities in progress (P). There is no water available on any trails. The west entry point, campgrounds and the Visitor Center have potable water. (Appendix 3.11 Trails Map).

Use: These uses are recommended based on trail suitability. Motorized use is only allowed on trails designated for Motorized use (M).

Mt. Bikes are not recommended on most trails in the park due to the deep sand and difficult access. H - Hiking, B - Mt. Biking, E - Equestrian, M - Motorized.

Technical Rock Climbing routes are by permit only.

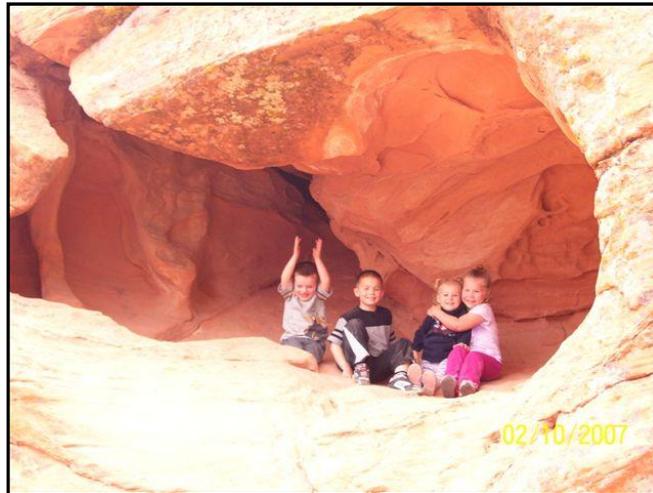
Trail or Route	Use	Developed Trailhead	Parking	ADA	Restroom	Picnic Shelter	Route/not maintained	Distance in Miles
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Elephant Rock Trail	H	X	X	X	X			.3
Arrowhead Trail	H	X	X	X	X			1.2
Old Arrowhead Trail	H, E, B		X				X	6.8
Natural Arch Trail	H		X				X	
Charlie's Spring Trail	H, E		X				X	5.5
Balancing Rock - Visitors Center	H		X	X	X			.5
Mouse's Tank and Petroglyphs	H	X	X	X	X	X		.75
Rainbow Vista Trail	H	X	X	P	P		X	1.0
White Domes Trail	H	X	X	X	X	X		1.1
Prospect Trail	H, E		X				X	11.0
Pinnacles Trail	H, E	X	X	X	X	X	X	4.5
Logandale Trail	M	X (BLM)	X		X		X	
Duck Rock	H		X				X	.25
Fire Canyon	H	P	P	P	P		X	.1
Cabins	H	X	X	X	X	X	X	.1
Petrified Logs	H		X					.1

Logandale Trails

The Logandale Motorized Trails System crosses through a small portion of the park at the northern end. This trail system was planned cooperatively with the Bureau of Land Management and completed in 2008. The majority of the trail lies on BLM lands with small sections that cross into the park boundary and back out (Attachment 3.10 Circulation Map and 3.12 Logandale Trails System Map).

Valley of Fire State Park



IV. GENERAL MANAGEMENT PLAN

A. PROCESS FOR THIS PLAN UPDATE

Data Inventory and Analysis - Staff collected site and regional area information for Valley of Fire State Park in the following categories: land use trends (ownership, land use, zoning, transportation, trails and utilities), natural resources (topography, geology, hydrology, vegetation, soils, slope, wildlife, climate, air quality and perceptual attributes), and cultural resources (existing facilities, archaeological and historical resources). This information was then analyzed to identify development limitations and site opportunities. User survey data from the past 5 years were analyzed and graphics were developed to present findings to the public at the first public workshop.

Public Participation – An assistance grant was applied for and received from the National Park Service Rivers and Trails Assistance Program. Deborah Reardon from the Las Vegas office assisted in strategic planning, meeting facilitation and public participation planning through the entire process.

Among the methods used to be responsive to existing and future needs were: 1) Survey of users, 2) Public meetings, 3) Continued liaison with community groups by staff, and 4)

Monitoring of trends and actual park use, 5) An additional survey was completed to include the internet, mailing and hard copies which were handed out at the visitors center.

The first rounds of public meetings were held June of 2009 in both Las Vegas and in Logandale. The 1990 Plan Goals and Issues were presented, as well as those brought up through surveys, staff and partners prior to the first public meeting. Maps, pictures, site inventory information, current demographics and trends, site analysis information and user survey results were presented at the public workshops.

The public was asked to provide input on issues, goals and objectives. They were also asked to put forth opportunities and ideas that the staff could use in development of alternatives.

An interdisciplinary team was gathered to include Partners in Conservation, Bureau of Land Management, Clark County, and the National Park Service to ensure that the public and private land owners adjacent to the park had ample opportunity to give input to the management plan development. Based on all available information, three alternatives were developed.

These alternatives were then presented for public comment at a second public meeting on December 8 and 9, 2009.

Participants

Participants in the development of the first phase of data inventory and analysis and assistance with the gathering of initial data and public meeting input include but are not limited to:

- National Park Service, Rivers and Trails Assistance Program
- Bureau of Land Management
- Lake Mead National Recreation Area
- University of Nevada, Las Vegas Landscape Architecture and Planning Research Office
- Nevada Natural Heritage Program
- Clark County Parks and Recreation
- The Nature Conservancy
- Partners in Conservation (PIC)
- Nevada Department of Wildlife

In 2009, four public workshops were held to discuss future development and management of Valley of Fire State Park. Together, with the public and partners, we looked closely at 15 of the main issues for the park. We developed three alternatives for each of the issues. These alternatives were based on "level of development" themes. They ranged from a low level of development/management through a relatively moderate level to a relatively higher level. The alternatives are provided in Appendix 4.1. The main park issues are provided to you below with the chosen alternative or management and development strategies for each.

B. MANAGEMENT PLAN

The new plan concept was developed by staff and the public in December, 2009. This park concept consists of five mission statements that will direct the park's management for the next 15 years or until amended or revised.

Park Concept

The Valley of Fire State Park offers some of the most unique natural landforms, archeological and paleontological resources and scenic values in the state of Nevada.

Sensitive areas in this desert ecosystem are protected for future generations while allowing for compatible recreational use; public access is controlled through designated trails, roadways and recreation areas.

The Park provides extensive interpretation and educational programs and amenities with an emphasis on engaging youth.

Valley of Fire State Park will continue to be an outdoor classroom through research partnerships that support the conservation and protection of resources.

All facilities in the park, including signs and interpretation, are designed to be unobtrusive, visually compatible with the natural landscape and consistent with scenic highway aesthetic standards.

1. General Management and Development Guidelines

- a. Design Guidelines:** Examine ways to incorporate green technologies in new facilities. Create designs that are consistent with the "desert ecosystem and Paleolithic" theme. New trails or facilities will not impact rock formations and be consistent with the State Scenic Byway standards for aesthetics.
- b. Visitors Center:** Continue updating existing visitor center to address current educational needs and environmental treasures of the park and region. Continue to provide informational and educational books, pamphlets etc. related to natural history. Continue collaboration with school groups and classes.

- c. **Park Land Protection:** The Park is encumbered under federal law which prohibits conversion of park lands into non-recreational/conservation use; therefore, non-conforming uses (i.e. cell towers) are not allowed.
- d. **Geo-caching** is allowed by permit only and is managed under statewide policies.
- e. **Hunting** is not permitted due to public safety concerns in the park's many congested areas.
- f. **Safety Improvements:** Install public safety kiosks and signs at trails that are long-distance, flash flood prone or where other dangers are known.
- g. **Park Entrances and Fee Collection:** Add fee booth at east entrance and add public safety notice kiosks.
- h. **System-wide Trail Enhancements:** Define parking areas at all trailheads and scenic viewpoint to halt vehicle parking on undesigned, sensitive areas. Add trail signs and educational signs with safety messages, desert ecosystem and Paleolithic theme. Pursue partnerships grants and alternative funding sources to complete these projects.

2. Issue Specific Guidelines

a. Utilities and Park Infrastructure

- The utilities in the state park are mostly original. Many of the facilities for visitors have been upgraded or renovated but for a few restrooms. Constant maintenance with multiple delays in water and electrical service occurs.
- *Due to the lack of projected general funding for the next decade, it has been determined that the renovation of the basic infrastructure to park utilities, with service the park staff and visitors is the priority of this development plan. (See Development Plan below).*

b. Natural Resource Management

- Continue to work cooperatively with the Nevada Department of Wildlife & US Fish and Wildlife Service to manage plants and animal habitats under the *Clark County Multi-Species Habitat Conservation Plan*.
- Continue weed abatement especially on tamarisk.
- Continue collaboration with Nevada State Parks Cooperative Association (NSPCA) on informational and educational books, pamphlets etc. related to natural history. Continue collaboration with school groups and classes.

c. Protect and interpret the historic, cultural, archaeological and Paleontological resources

- Continue partnerships with professional groups and UNLV to complete comprehensive surveys.

- Continue interpretive planning and upgrade or add educational displays at all significant sites as determined needed and appropriate.
 - In areas where the significance of the find, or the level of vandalism is extraordinary; management may include prohibiting access to resources with the use of barriers, fences, obscuring areas, or bury in situ if needed. Relocate resources or obscure from public view as needed.
- d. Northern Management Area - (NMA) - [Includes Logandale Motorized Trails within the State Park.] Motorized use and supporting facilities should be permitted in the north half of the park (This area includes the Logandale trails within Valley of Fire)**
- Motorized use will be allowed on designated trails only associated with the Logandale trail system. Strive to find and designate one connector trail through north end of park through future cooperative efforts with BLM and Clark Co.
 - Use of the area should be under annual state park permit, or park day use fee.
 - Signage and public education must be significantly increased through partnerships with local clubs, BLM, and grants.
 - With the exception of designated Logandale trails in the northern management areas, motorized use is limited to street legal vehicles on designated roads.
- e. Northern Management Area (NMA) - Special OHV Events**
- *The number and type of special OHV events to be permitted in NMA is contingent upon state park policy.*
 - Determine routes for current permits and special events and allow under permit only.
 - Install signs designating exact route(s) for events.
 - GPS these routes and make available for download from park website.
 - Designate these same routes for use by general public (fee based).
- f. Northern Management Area (NMA) Includes Logandale area which crosses into the State Park - Equestrian and Pedestrian Trails**
- Allow equestrian use on same trails as motorized OHV. However, there will be no official designations for equestrian trails or equestrian trailhead development on those trails.
 - Investigate other equestrian and pedestrian - non motorized trails in the north that are separate from motorized.
 - Identify equestrian parking/trailheads in collaboration with BLM, Clark County, Moapa Valley and Overton; work cooperatively with stakeholders to designate and sign these trails.

g. Northern Management Area (NMA) - Camping

- Identify and designate primitive camp areas to be used by permit only and fee based. These would be dry camping sites/areas and fire rings and sanitary facilities would be installed if feasible.

h. Southern Management Area (SMA) - Trails

- Formally design/build, designate and sign current trails shown below.
- Trail system includes both constructed trails and routes.
- Upgrade all trailheads to include interpretive and safety kiosks.
- Mediate problems with "migrating parking areas" with defined borders of rock/curbing and/or pavement where needed based on soils stability and natural environment. Install barriers where needed for protection of resources. Add the Duck Rock equestrian route and trailhead, Fire Wash trail and equestrian trailhead.
- Close road located past Fire Canyon Vista to motorized vehicles; open only for marathon, pedestrian and administrative use.

Trail or Route	Use	Developed Trailhead	Parking	Restroom	Picnic Shelter	Route - marked but not maintained	Distance in Miles
Petrified Logs	H	X	X				.1
Elephant Rock Trail	H	From East Entrance					.3
Arrowhead Trail	H						1.2
Old Arrowhead Trail	H, E, B	Three access pts, west, sisters, and East from Arrowhead					6.8
Natural Arch Trail	H	From East Entrance					.5
Charlie's Spring Trail	H, E	From Arrowhead				X	5.5
Balancing Rock Trail	H	From Visitors Center (VC)					.5
Mouse's Tank Trail	H	X	X	X	X		.75
Rainbow Vista Trail	H	X	X	X		X	1.0
White Domes Trail	H	X	X	X	X		1.1
Prospect Trail	H, E	X	X			X	11.0
Pinnacles Trail	H, E	X	X	X	X	X	4.5
Logandale Trail	M	X (BLM)	X	X		X	
Duck Rock	H	Combined with Equestrian					.25
Duck Rock Equestrian (NEW)	E	X	X				Unknown
Fire Canyon	H	X	X	X		X	.1
Cabins	H	X	X	X	X	X	.1
Fire Wash (NEW)	H,E, B	1. Near campground loop and 2. VC					Unknown

Mt. Bikes are not recommended on most trails in the park due to the deep sand and difficult access.

H - Hiking, B - Mt. Biking, E - Equestrian, M - Motorized. Technical Rock Climbing routes are by permit only.

i. Biking and Marathon Use

- Expand shoulders where feasible to improve user safety.
- Define and mark pull-outs.
- Work with neighboring agencies to plan potential extensions of the bike lane in the future.

j. Camping in Southern Management Area

- Maintain current sites. Add walk-in tent sites. Determine where to implement tent and car camping “non-generator” sites at Arch Rock.

k. Day Use Picnicking (SMA) and Group Use area

- Improve facilities including upgraded restrooms, interpretive signs, parking and roads, BBQ grills and shade structures.
- Redesign Group use area behind beehives to accommodate additional use and provide drinking water where feasible.
- Pave roads and parking areas where needed based on soils stability and natural environment. Install barriers where needed for protection of resources.
- If water development becomes feasible, upgrade water developments in all areas as affordable. Otherwise, manage as dry sites.

l. Staging Area for Movies and Special Events

- Re-grade unpaved parking area and add drainage improvements.
- Design staging area to be lower than road, hidden from view of Visitors Center and scenic byway.
- If future water development improves the quality and quantity sufficiently, reconsider providing comfort facilities.

m. Atlatl Rock Picnic Area and Proposed Amphitheater

- Upgrade/replace restrooms, signs and kiosks. Develop an amphitheater to seat 50-100 people based on architect’s design and redesign of parking area. Follow design guidelines to blend structures in with rock and natural environment.

n. Weddings

- Specific areas for weddings by permit only. Four existing areas: Visitors Center, Rainbow, Seven Sisters and Cabins.
- Monitor sites for damage and close/rehab as needed. New areas can be opened to meet demand or increased per day with addition of permanent full-time staff needed to manage workload.

o. Land Acquisition Plan

- State Parks continues to explore opportunities to consolidate management boundaries and connect park lands. Continually

investigate opportunities for acquisition of private lands that link north end with south end. Dispose of or consider trades for outlying park parcels in order to consolidate park lands for increased recreation viability and management efficiency.

p. Interpretation and Education - Level of investment for interpretation and education.

- Strive to find funding to increase interpretive/education.
- Increase focus on education of children in the outdoors.
- Strive to find funding to hire one FTE interpreter.
- Develop partnerships with local communities and regional partners to take Valley of Fire interpretive messages to the community.

C. DEVELOPMENT PLAN

Available funding and funding opportunities will drive the priority of implementing the upgrades and improvements in this plan. There are no improvements that must occur prior to or in support of another, therefore, there are no phases.

Development Task
Replace dilapidated electric line and conduit
Replace dilapidated water line and tanks
Replace dilapidated and outdated telemetry system
Continue to explore water availability
Design, layout and construct Fire Wash trail, trailheads, parking and signs. Add water source on the trail if feasible
Design and construct equestrian trailhead in Fire Wash if water is feasible.
Design and construct amphitheater at Atlatl Rock Picnic Area.
Develop a new combined trailhead for Clark's Monument, Clarks Wash, and Arrowhead Trails.
Maintain and therefore widen the main road shoulders to accommodate non-motorized traffic for special events and general public; runners, walkers and bicycles.
Redesign parking areas at trailheads and scenic vistas and delineate parking areas with structures that eliminate undesigned parking.
Renovate/replace old signs and kiosks
Install public safety kiosks and signs at trails that are long-distance, flash flood prone or where other dangers are known.
Reseed and naturalize social trails in all areas of the park that are no designated trails or routes
Install signs, directional signage etc... and restore undesigned trails in the Logandale trails area on State Park lands
Upgrade toilets were needed using green technology if feasible
Redesign and re-develop Beehives parking area and road to group use area.
Redesign and re-develop group use area.

Designate or develop tent sites at Atlatl Campground
Design and construct new trailhead parking at Duck Rock.
Design and construct new parking area and interpretive kiosks at Fire Canyon Scenic Vista
Place directional signage on all trails and routes as needed
Reconstruct and maintain trails as needed
Add fee booth at East Entrance
Design and place protective barriers around paleontological and archeological sites.