# Chapter 10

# Recreation Use on Federal Lands in Southern Nevada

**Alice M. McSweeney**

## Introduction

Providing for appropriate, diverse, and high quality recreational use of southern Nevada's lands and ensuring responsible visitor use is an ongoing challenge for the Federal agencies that manage the majority of the area (fig. 1.1). Over 87 percent (61,548,000 acres out of Nevada's 70,275,000) of Nevada's lands are administered by the Federal government, which is the highest percentage in the nation (DeLoney 2004). Some of the largest values are for the counties of southern Nevada. The amount of Federal land in Clark, Lincoln, and Nye Counties estimated from the Nevada State Library and Archives in 2000 was 89.4 percent; 98.2 percent; and 92.4 percent respectively (http://nsla.nevadaculture.org/index.php). This chapter addresses Sub-goal 2.4 in the SNAP Science Research Strategy which focuses on recreation use on Federal lands in southern Nevada (table 1.3; Turner and others 2009). The demands for various types of recreational opportunities are discussed and the ways in which Federal agencies can provide quality recreational experiences without compromising resources are explored. Also discussed are current visitor use patterns and services provided by the designated recreation areas in southern Nevada.

## Nevada's Population

There is a correlation between population growth and an increase in outdoor recreation. The rapidly growing population of southern Nevada results in an increase in recreational demands on the area's public lands, and an associated shift in demographics brings changes in recreation tastes and preferences.

Two significant factors influence recreationists and the natural resource base that supports outdoor recreation in Nevada. One is the fact that the State of Nevada ranks first in Federal lands; and the second is the highly urbanized population of the state, in which 94 percent resided in urban areas in 2000 (DeLoney 2004). According to the 2010 U.S. Census, the population of Nevada (2,700,551) grew by 35.1 percent since 2000. Nevada is the only state that has maintained a growth rate of 25.0 percent or greater for the last three decades and, until the recent economic downturn, was the fastest-growing state for five straight decades (U.S. Census Bureau 2011a). In southern Nevada, the population of Clark County (1,951,269) grew by 41.8 percent since the 2000 Census. The city of Las Vegas (population 583,756) grew by 22.0 percent; Henderson (population 257,729) grew by 47.0 percent; and North Las Vegas (population 216,961) grew by 87.9 percent since 2000 (U.S. Census Bureau 2011b).

Nevada's population is heavily concentrated in metropolitan counties and, while population growth has been significant across the state, population increases in Clark County far exceed those in other areas. Over 1.9 million people, or more than 72 percent

of Nevada's 2.7 million residents, live in Clark County. In addition, the state's minority population has grown rapidly from 16.8 percent in 1980 to 45.8 percent in 2010. Growth of the Hispanic population has been especially rapid in Nevada. In 2010, 26.5 percent of the state's residents were of Hispanic origin (WRDC 2011). The highest proportion of Hispanics (29.1 percent) resides in Clark County, which also has significant Black (10.5 percent) and Asian (8.7 percent) populations. Over 22 percent of Clark County residents are foreign born and 32.1 percent of persons above the age of 5 years speak a language other than English at home (U.S. Census Bureau 2012). The Clark County School District, 5th largest in the nation (Sable and others 2010) has a racial/ethnic distribution of 41% Hispanic, 14.1% Black, 34.6% White, 9.6% Asian, and 0.7% Native American. Just over 18% of students have limited English proficiency (CCSD 2010). The increasing demographic diversity of southern Nevada can lead to difficulties in educating a diverse urban population about recreational issues.

## Outdoor Recreation Issues

The 2003 Statewide Comprehensive Outdoor Recreation Plan (SCORP) developed by the Nevada Division of State Parks (NDSP) is Nevada's 8th edition of such a plan since the passage of the Federal Land and Water Conservation Fund Act of 1965. The plan provides review and study of recreational use within the State and presents the expectations of Nevadans regarding outdoor recreation. The plan's goal is to increase and improve the quality of outdoor recreation opportunities to meet the needs of the citizens of Nevada as well as the State's many visitors. SCORP identifies the top outdoor recreational issues facing Nevada and recommends actions to address each issue (DeLoney 2004).

The issues and recommendations reflect results of participant responses from a public input process through a mail-in survey titled "Nevadans Outdoors – a Survey on Outdoor Recreation in Nevada." A function of the plan is to provide information and recommendations that will minimize uncertainty in the decision making process of allocating outdoor resources. The dominant concern of the respondents was to keep Federal lands open for a wide variety of outdoor recreation activities while protecting the state's natural resources. According to the SCORP study, Nevadans understand the necessity of balancing recreational use with natural resource conservation (DeLoney 2004).

The eight top recreation issues derived from the SCORP study are (1) public access to public lands for diverse outdoor recreation, (2) funding parks and recreation, (3) providing recreational trails and pathways, (4) balancing the protection of Nevada's natural, cultural, and scenic resources with user demands, (5) protecting water resources as vital components of Nevada's recreational base, (6) interpretation and education of outdoor recreation opportunities, (7) increasing demand from Nevada's growing population on outdoor recreation resources and suppliers, and (8) coordination and cooperation among recreation providers (DeLoney 2004).

The following expanded discussion of the issues is drawn from participant responses in the 2003 SCORP report. Keeping Nevada's abundant open space accessible was ranked as the most pressing issue. The growing need to protect, maintain, and increase public access to public lands in Nevada reflects a demographic population growth and reduction of open space nation-wide. Development, particularly in the urban interface, was cited as a major threat to public land access (DeLoney 2004).

Issue number two states that existing levels of funding for outdoor recreation are inadequate to meet the needs of Nevada. As noted by participants, maintenance of outdoor recreation areas and facilities (Federal, state, and local) has not kept pace with demands

created by a rapidly growing population and increasing numbers of out-of-state visitors (DeLoney 2004).

The third issue calls for provision of recreation trails and pathways throughout Nevada's rural and urban areas. As with other issues, population increase is a major factor; the promotion of recreation-based tourism adds to the demand. Connectivity is important for recreational trails and for transportation needs in urban areas such as in Clark County. This requires cooperation between agencies when trails are to cross through differing jurisdictions (DeLoney 2004).

Respondents emphasized in the fourth issue that responsible use is essential to conserve the natural resources that make areas attractive to recreationists. Public education and active law enforcement were cited as means of protecting valuable resources. "There is no such thing as non-consumptive outdoor recreation activity…The degree of consumption is dependent on the outdoor recreational activity and the outdoor recreationist engaged in the activity" (DeLoney 2004: 26).

Water resources, listed as fifth, must be protected to maintain the quantity, quality, and accessibility needed for public recreation. However, recreational use of water often competes with other uses such as water for human and municipal consumption or for agricultural use. Another consideration is the fact that wildlife also depend on the limited water resources (DeLoney 2004).

The sixth issue involves provision for environmental, cultural, and heritage interpretation and educational programs. Suggestions include:

1. Educate the general population, the youth of the state, new residents, and visitors about natural resources and outdoor recreation activities;
2. Provide information that allows families to make safer choices concerning their outdoor recreation plans; and
3. Provide greater accessibility for those with impairments (DeLoney 2004).

As Nevada's multi-cultural population continues to expand, there is an issue of greater recreational demands on resources and suppliers. With an increasing number of recreationists, there is a change in the types of interests they choose to pursue. There is a shift from "the old traditional" uses of hunting, fishing, and camping to such activities as off road vehicle use and rock climbing. There are also changes in visitor types to a more urban population who expect recreation enhancements (toilets, developed campsites, brochures, and site interpretation). These increasing recreation demands require funding, planning, and staffing. At the same time, consideration must be given to reducing the added impacts to natural resources (DeLoney 2004).

Coordination and cooperation between public and private recreation providers was the final issue discussed in the SCORP study. There is concern that various recreation interests are becoming polarized against each other and that lack of cooperation and duplication of effort result in a waste of taxpayers' money. Needs were expressed for more cooperation between agencies and more use of volunteers (DeLoney 2004).

## SNAP Interagency Recreation and Wilderness Planning

There are four Federal land management agencies in southern Nevada that oversee eight congressionally designated resource areas. The Bureau of Land Management (BLM) oversees the Red Rock Canyon and Sloan Canyon National Conservation Areas (NCAs) and approximately 3.4 million acres of lands outside of the National Conservation Areas (Reardon, personal communication 2011b). The National Park Service (NPS) administers Lake Mead National Recreation Area (NRA). The United States Forest Service (USFS)

manages Spring Mountains National Recreation Area (NRA). The United States Fish and Wildlife Service (USFWS) is responsible for the Desert National Wildlife Refuge Complex, which is comprised of four distinct National Wildlife Refuges (NWRs): Ash Meadows NWR, Desert NWR, Moapa Valley NWR, and Pahranagat NWR (SNAP 2002).

In 2002 the Federal managers of SNAP directed the four agencies (BLM, NPS, USFW, and USFS) to conduct interagency recreation management and to form the Interagency Recreation Team. The team's vision is to provide interagency collaboration in the planning and management of recreational opportunities, facilities, and services while honoring the natural setting and complementing the quality of life in southern Nevada. The team's mission is for agencies to work together and with the surrounding communities to promote natural and cultural resource stewardship by providing appropriate and sustainable recreation opportunities (SNAP 2002).

Accomplishments include completion of the National Visitor Use and Monitoring Survey and an inventory of over 9,000 miles of roads and trails. The survey and inventory will serve as a foundation for Recreation Area Management Plans, which will identify roads and trails on Federal lands, including connections to adjacent urbanized communities. In addition to planning, the Recreation Team is working with the Education Team to provide public information for recreation opportunities on Federal lands through outreach products, including the OHV Adventure Guide and the forthcoming interactive and recreation opportunities maps and non-motorized trail guide (Reardon, personal communication 2011a).

The SNAP Recreation Team initiated recreation visitor sampling on all SNAP lands using a single monitoring program based on the USFS National Visitor Use Monitoring (NVUM) program. Collectively, these NVUM reports provide comprehensive statistics on recreation use, visit characteristics, visitor spending, and the satisfaction of recreationists with recreation opportunities and resource conditions. Although the individual Federal agencies have differing management objectives, this information is useful given the proximity of these lands to each other and the shared potential base of local recreationists and tourists (SNAP 2010).

Nearly 3,000 visitors were surveyed during the 2005-2008 sampling period; data collected were used to assess visitor use of the public lands that comprise SNAP. The 2,896 visitor-completed surveys were fairly evenly distributed throughout the year, representing the full range of seasonal activities available on SNAP lands. Over all, the most popular activities reported were hiking and viewing natural features. There were differences in the popularity of recreation choices across agencies, because management objectives, topography, and recreation resources differ from agency to agency. For example, on BLM lands there was a greater percentage that listed driving for pleasure and rock climbing as primary activities; water-based recreation was most prevalent on NPS lands; viewing wildlife was listed as the primary activity on USFWS lands; while camping was listed as the primary activity on USFS land (SNAP 2010).

Based on the results of the NVUM sampling approach, recreation use on BLM, USFWS and USFS lands during the survey period (2005-2008) amounted to 2.7 million public land visits annually. The National Park Service has a locally developed estimate for recreation use and counted 6,263,530 visits to Lake Mead National Recreation Area in Nevada during 2009. When the NPS locally developed recreation estimate is combined with the estimates for the other agencies, using the NVUM sampling data, recreation use for the SNAP agencies sums to more than 9 million visits (SNAP 2010).

The BLM and NPS manage major land bases in southern Nevada, and account for nearly 90 percent of the area's recreation use. The survey determined that approximately 53 percent of visits are by people who traveled less than 50 miles from home to participate in some form of recreation. More than half of the visits were from Nevada

residents. People traveling greater than 500 miles from home made up 25 percent of visits, and slightly over 5 percent were foreign visitors. Recreation visits to SNAP lands generate economic activity (motel/hotel, restaurant, fuel, groceries, etc.) to communities surrounding agency lands (SNAP 2010).

The overall satisfaction rating of the four SNAP agencies indicated that the vast majority of visitors surveyed were at least "somewhat satisfied" with their visit. Individually, the BLM had the highest rating. Visitor satisfaction for each was greatest at developed sites and lowest at undeveloped sites. Satisfaction was consistently lowest overall for services such as information, signage, and employee helpfulness. Areas identified as needing attention included restroom cleanliness, information provided, signage, and trail condition. Over 90 percent of responses indicated a satisfactory perception of safety (SNAP 2010). Informational maps and signage were the items most frequently cited as increasing the perception of safety.

Agencies also are working to develop interagency Wilderness Management Plans. The first interagency Wilderness Management Plan in the nation was completed for the Muddy Mountains Wilderness, which is jointly managed by the BLM and the NPS. Plans for North McCullough, South McCullough, and Wee Thump-Joshua Tree Wilderness Areas have also been completed by the BLM. Planning is underway for other jointly managed areas such as El Dorado, Ireteba Peaks, Spirit Mountain, Pinto Valley, Jimbilnan, Black Canyon, Bridge Canyon, and Nellis Canyon and the remaining six designated Wilderness areas—Mt. Charleston, Rainbow Mountain, La Madre, Jumbo Springs, Lime Canyon, and Arrow Canyon. Additionally, SNAP and the Friends of Nevada Wilderness are working in partnership to establish a Wilderness Steward Program. Wilderness maps with interpretive and educational information are also under development (Holland 2011, personal communication; SNAP 2011a).

### *Bureau of Land Management (BLM)*

**Red Rock Canyon National Conservation Area (NCA)**—Red Rock Canyon National Conservation Area is located approximately 17 miles west of the Las Vegas strip. It was designated in 1990 to preserve the environmental, cultural, and scenic qualities of the area for present and future generations. Red Rock's dramatic visual attraction is the result of a geologic thrust of grey limestone up and over younger red sandstone, 65 million years ago (USDI BLM 2010a).

The NCA consists of two distinct areas. The northern portion is mostly undeveloped and primitive and includes designated wilderness areas. The southern portion features a 13-mile scenic drive, visitor's center, picnic areas, camp sites, and over 100 miles of trails. The visitor's center contains extensive interpretive exhibits and provides environmental education opportunities. Recreational activities include birding, hiking, horseback riding, and rock climbing. Also available to visitors are informative walks and talks, demonstration programs, and educational series (USDI BLM 2010a).

Red Rock Canyon NCA has three major goals. One is to provide for public enjoyment and visitor experience. This involves visitor safety and satisfaction, while promoting understanding and appreciation of the area. A second goal is the enhancement of appropriate recreational opportunities by improving and expanding the trail system, campground, and other high-use visitor areas. Also considered are the impacts of human activity, removal of public safety hazards, and coordination with other trails and maps within adjacent urban areas. The third goal is the preservation of Red Rock Canyon's resources. This involves ecosystem restoration, landscape rehabilitation, wildlife management, and cultural resource protection. It is expected that proposed fee increases needed to achieve these goals will have a minimal impact on most visitors; social benefits should outweigh the economic costs (USDI BLM 2010a).

**Sloan Canyon National Conservation Area (NCA)**—Sloan Canyon National Conservation Area was designated by Congress in 2002 to preserve a portion of southern Nevada's Mojave Desert. The Northern McCullough Wilderness is entirely contained within the NCA. Sloan Canyon NCA encompasses 48,438 acres and forms the mountainous southern skyline of the cities of Las Vegas and Henderson. It contains scenic resources, wildlife habitat, and archaeological sites, most notably the Sloan Canyon Petroglyph Site. Sloan Canyon is located approximately 20 miles southeast of the City of Las Vegas and borders the City of Henderson, Nevada. It is situated at the edge of a rapidly urbanizing valley. Residential and business development is expected to border much of the northern and western edges of the Conservation Area (USDI BLM 2009).

Recreation in the form of hiking, mountain biking, equestrian, and illegal off-highway vehicle (OHV) use have become more prevalent in the northern portion of Sloan Canyon NCA as urban growth in the Las Vegas Valley encroaches. The more rugged and isolated southern portion receives limited visitation, primarily cross-country hiking and equestrian use (BLM 2010b). Activities encouraged in the North McCullough Wilderness include hiking, horseback riding, and wildlife observation. Vehicles, including mountain bikes, are prohibited within the Wilderness. (USDI BLM 2010b)

Red Rock Canyon and Sloan Canyon NCAs represent just two of the areas the BLM Southern Nevada District manages that are enjoyed by the public. Although most lands managed by BLM do not contain recreational improvements, hundreds of miles of trails are available for exploration as well as 15 wilderness areas and 22 Areas of Critical Environmental Concern, totaling over one million acres. BLM Public Lands located outside the National Conservation Areas comprise over 3.4 million acres and include popular recreation areas, such as Logandale and Gold Butte, that provide additional recreation opportunities such as OHV riding (Logandale), rock crawling, camping, hiking, hunting, cultural resources, and scenic driving. Other treasured areas include Nellis Dunes and Big Dune for OHV thrill-based recreation (Reardon, personal communication 2011a; Ronning, personal communication 2012).

In order to plan for these varying uses and link with the BLM's 2001 Strategy for Motorized Off-Highway Vehicle Use, the agency is developing a non-motorized Trails Master Plan to meet the needs of hiking, equestrian, and mountain biking groups. The trail network would connect with the trails of Henderson's Open Space and Trails Plan (City of Henderson 2005). The intention is to manage for public use and enjoyment while protecting the NCA's sensitive resources (USDI BLM 2009).

The BLM's 2001 Strategy for Motorized Off-Highway Vehicle Use was an effort to determine and implement management solutions designed to conserve soil, wildlife, water quality, native vegetation, air quality, heritage, and other resources, while providing for appropriate motorized recreational opportunities (USDI BLM 2001). The OHV Guide to Public Lands within Clark County provides users with information on where roads and trails are open to motorized recreation as well as tips on safety, responsible riding, and potential impacts to the environment (SNAP 2011c).

### *National Park Service (NPS)*

**Lake Mead National Recreation Area (NRA)**—Established as America's first National Recreation Area, Lake Mead NRA was set aside as a unit of the NPS in 1964 to provide recreation for visitors and to preserve the natural and cultural resources of the area. The NRA encompasses over 1.5 million acres of land and includes two man-made lakes. Hoover and Davis Dams backed up the Colorado River as it flows through this extremely arid region and created Lake Mead and Lake Mohave respectively. Open year round, these lakes/reservoirs provide a startling contrast with the surrounding desert ecosystem and are a great attraction to recreationists (USDI NPS 2011a).

The western most portion of Lake Mead is located approximately 30 miles east of the city of Las Vegas at the base of the River Mountains. There are nine main access points to the lake. The NRA stretches north to Overton, east to the Grand Canyon National Park, and south to Laughlin and Bullhead City (USDI NPS 2011a). In 2010, visits to Lake Mead NRA totaled 7,080,758. The projected number for 2011, with an increase of 0.9 percent, is 7,146,008. In 2012, with an expected decrease of -1.9 percent, visitor numbers are forecast to total 7,011,264 (Street 2011).

According to the NPS Single Agency Report (2009) the primary activities, accounting for over half of visits to Lake Mead and Lake Mohave, are swimming, fishing, and motorized water activities. About 54 percent of visits to Lake Mead are by local area residents on day trips away from home; in contrast, there are a greater percentage of nonlocal residents on day trips to Lake Mohave (USDI NPS 2009). While the waters are a great attraction to many, Lake Mead NRA offers a myriad of other recreation opportunities to its visitors. Such activities as backcountry exploration driving, biking, camping, hiking, horseback riding, hunting, photography, and wildlife observation draw visitors to the desert landscape. In addition, the National Park Service offers a variety of ranger-led programs throughout the year. Guided hikes are presented at both Lake Mead and Lake Mohave throughout the fall and winter seasons (USDI NPS 2011a).

Recreation decisions at Lake Mead are based on the General Management Plan (USDI NPS 2011b). The NPS is addressing recreation and access within Lake Mead through development concept plans, such as plans for Katherine Landing and Cottonwood Cove (USDI NPS 2011c). The official website of Lake Mead NRA is an excellent source of information for the prospective visitor. Along with maps and facts about the area, the NPS offers detailed advice on safety precautions, essential equipment, and any regulations that pertain to various activities such as boating, fishing, hiking, hunting, or horseback riding. Throughout the literature there are reminders to respect the animals and plants that occur in the area (USDI NPS 2011a).

In a 1997 study by Graefe and Holland, the two most serious problems cited by lake users were crowding by personal watercraft operating too close together and litter along the shore. Forty-three percent reported observing unsafe boating situations. Shoreline litter was identified as a problem needing management attention at Lake Mead NRA. Lake users expressed great support for aggressive enforcement of safety rules and regulations (Graefe and Holland 1997).

### *U.S. Forest Service (USFS)*

**Spring Mountains National Recreation Area (NRA)**—Spring Mountains NRA encompasses more than 316,000 acres in the Humboldt-Toiyabe National Forest. The General Management Plan (GMP) for Spring Mountains NRA includes goals, objectives, desired future conditions, and standards and guidelines for the entire NRA as well as specific direction for each of the four management areas: Developed Canyons, Mt. Charleston Wilderness, West-side, and Mt. Stirling (USDA FS n.d.a).

The Forest Service-managed NRA is located in Clark County, Nevada, 30 minutes west of downtown Las Vegas, and shares its eastern boundary with Red Rock Canyon NCA. The Spring Mountains, with its wide range in elevation, provides a haven for wildlife and a vital watershed fed by numerous springs. This mountain range serves as a quick get-away for urban residents of the Las Vegas metropolitan area. High elevations and cooler temperatures in proximity to the large population base offer visitors a welcome respite from the prevalent valley heat (http://www.fs.usda.gov/wps/portal/fsinternet/).

Spring Mountains NRA contains three Federally designated wilderness areas; Mt. Charleston, La Madre Mountain, and Rainbow Mountain (also in the Red Rock Canyon

NCA). Mt. Charleston, elevation 11,918 feet, is the third highest peak in Nevada and the only peak in southern Nevada that rises above treeline. The diverse life zones range from desert to alpine and support a wide variety of wildlife. The Spring Mountains provide habitat for more than 25 plants and animals found nowhere else on earth. Visitors are reminded to protect the animals and plants of the area that depend on Spring Mountains as an "island in the desert" (USDA FS n.d.b).

Spring Mountains NRA is a year-round recreation area and, owing to its great variation in elevation and temperature, offers a wider array of recreational opportunities compared with the rest of southern Nevada. Camping, picnicking, and hiking are available in the warmer months. Other activities include horseback riding, mountain biking, rock climbing, hunting, and wildlife viewing. There are opportunities for snow-based activities in winter (USDA FS n.d.b). According to the Single Agency Report, visitors to Spring Mountains NRA identified the top five recreation activities as viewing natural features, hiking/walking, relaxing, driving for pleasure, and viewing wildlife. Developed camping was also listed as a top "main" activity (USDA FS 2006).

There are 51 miles of hiking trails on Spring Mountains NRA. Most are open to horseback riding, with the exception of the upper section of the Bristlecone Trail. Riding is discouraged in areas of dangerously steep terrain or heavy visitor use. Mountain biking is limited to specific trails as posted and is prohibited in wilderness areas. Off-highway vehicle (OHV) use is restricted to roads and trails designated as "Motorized Trail" or "Forest Road." The visitor guide lists travel advice, safety tips, trail and boundary restrictions, and warns against littering and disturbance of cultural sites (USDA FS n.d.b).

### *U.S. Fish and Wildlife Service (USFWS)*

**Desert National Wildlife Refuge (NWR) Complex**—The Desert NWR Complex, encompassing more than 1.6 million acres of land, is located in Clark, Lincoln, and Nye Counties of southern Nevada. The Complex consists of four separate refuges, Ash Meadows NWR, Desert NWR, Moapa Valley NWR, and Pahranagat NWR. Visitor services are primarily focused on wildlife-dependent recreation and vary at each refuge. The four refuges also provide resources that are important to local culturally affiliated tribes (USDI FWS 2009a).

**Ash Meadows National Wildlife Refuge (NWR)**—The Ash Meadows NWR is located approximately 90 miles northwest of Las Vegas and 30 miles west of Pahrump in the Amargosa Valley of Nye County. A day-use area, the refuge currently expects over 50,000 visitors annually. Ash Meadows NWR is comprised of over 23,000 acres of spring-fed wetlands and alkaline desert uplands. Providing habitat for at least 24 plants and animals found nowhere else in the world, Ash Meadows contains the greatest concentration of endemic life of any locale in the United States. This desert oasis is a major discharge point for an underground aquifer system stretching 100 miles to the northeast (USDI FWS 2011a).

Wildlife-dependent activities at Ash Meadows include bird watching, photography, wildlife observation, environmental education, interpretation, and hunting (in the fall). Picnicking and hiking are the major non-wildlife activities (USDI FWS 2009a). The refuge office (open weekdays 8AM to 4PM) offers brochures and leaflets, bird lists, an interpretive kiosk, and access to the Crystal Springs Interpretive Boardwalk Trail. Point of Rocks Boardwalk and Longstreet Boardwalk are two other interpretive trails (USDI FWS 2011a).

Rules, regulations, and safety advice are stated clearly in Ash Meadows NWR literature. Such activities as fishing, off-highway vehicles (OHVs), horseback riding, and collecting of artifacts or natural objects are prohibited on the refuge. Strict regulations

are enforced during hunting season, including restrictions regarding use of hunting dogs, and reminders regarding trespass on private land in-holdings (USDI FWS 2011a).

Ash Meadows NWR works with a variety of agencies and organizations in the management of the refuge. Partnerships include Death Valley Natural History Association, Death Valley National Park (NPS), Southern Nye County Conservation District, U.S. Geological Service (USGS), local land owners, and others (USDI FWS 2009b).

**Desert National Wildlife Refuge (NWR)**—The Desert NWR is located immediately north of the rapidly expanding cities of North Las Vegas and Las Vegas. The western portion of the Refuge contains military withdrawn lands that are closed to public access (USDI FWS 2009b). Currently the refuge expects over 68,000 visitors annually (USDI FWS 2011b).

The largest refuge in the contiguous United States, the Desert NWR includes more than 1.5 million acres (over 2,300 square miles) of rugged mountain ranges and panoramic valleys. Elevations ranging from 2,200 feet to nearly 10,000 feet and corresponding variation in rainfall (less than 4 inches at lower elevations to greater than 15 inches on the highest peaks) have created diverse habitats that are suited to a wide variety of flora and fauna. Desert NWR is home to 52 species of mammals and over 320 species of birds. It forms one of the largest intact blocks of desert bighorn sheep habitat remaining in the southwest (USDI FWS 2005).

Wildlife-dependent recreational activities available on the Desert NWR include wildlife observation, photography, environmental education, interpretation, and hunting (limited). Non–wildlife-dependent recreational activities include primitive camping, picnicking, backpacking, and hiking (USDI FWS 2009a). "There are several unmaintained social trails used regularly by the public, including Hidden Forest, Gass Peak, Bird Song Loop and trails around Corn Creek" (Yost, personal communication 2012). Rules, regulations, and safety advice are stated clearly in Desert NWR literature. Cellular telephone coverage is limited in the area. The roads are primitive, no fuel or service is available in the refuge, and road warnings are posted for safety. Only licensed street-legal vehicles are allowed on the backcountry roads. Use of All-terrain Vehicles (cycles and quads) is not permitted within the refuge. Travel into the backcountry is best appreciated by foot or horseback (USDI FWS 2005).

**Moapa Valley National Wildlife Refuge (NWR)**—The Moapa Valley NWR is located approximately 60 miles northeast of Las Vegas in Clark County. The refuge is situated within the Moapa Valley south of State Highway 168 and the upper Muddy River, between Interstate 15 and U.S. Highway 93 (USDI FWS 2009b). Moapa Valley NWR is only open on Saturdays and Sundays (9 a.m. to 3 p.m.) from Labor Day through Memorial Day. This is due to the refuge's small size, fragile habitats, and ongoing restoration work (USDI FWS 2011c).

Moapa Valley NWR encompasses 116 acres and is part of a system of thermal springs at the headwaters of the Muddy River, which eventually flow into Lake Mead. These springs provide riparian and aquatic habitats for sensitive birds, bats, and fish. Most notably, the refuge protects an endangered population of the endemic Moapa dace (a small fish commonly found throughout the waters of the Muddy River system) and supports a diversity of birds including breeding populations of the endangered southwestern willow flycatcher. Hiking, picnicking, interpretation, environmental education, wildlife viewing and photography are recreational activities available at Moapa Valley NWR (USDI FWS 2009b). Moapa Valley was the first refuge in the National Wildlife Refuge System to be created for an endangered fish (USDI FWS 2011c).

**Pahranagat National Wildlife Refuge (NWR)**—The Pahranagat NWR is located approximately 90 miles north of Las Vegas at the southern end of the Pahranagat Valley in Lincoln County. Pahranagat NWR consists of 5,380 acres of marsh, open water, native grass meadow, cultivated cropland, and riparian habitat. This diversity of habitat supports over 230 species of migratory bird and other resident wildlife. There are four main water impoundments. The refuge expects over 32,000 visitors annually (USDI FWS 2011d).

Wildlife-dependent recreation activities include interpretation, environmental education, (USDI FWS 2009a) wildlife observation, fishing, and hunting. Bird watching is popular on this refuge; bird lists are available online, at the refuge office, or at information centers located throughout the refuge. Bird abundance and diversity are highest during spring and fall migrations. Camping and picnicking are permitted along the eastern shoreline of Upper Pahranagat Lake (USDI FWS 2011d). There are two unmaintained trails, Davenport and a loop around Upper Lake, but hiking is permitted throughout the refuge (Yost personal communication 2012).

Pahranagat NWR works with a variety of other agencies and organizations in the management of the refuge. Among others, these partnerships include National Audubon Society, Nevada Department of Wildlife, U.S. Bureau of Reclamation, Great Basin Bird Observatory, Bureau of Land Management, University of New Mexico, Northern Arizona University, and NPS Exotic Plant Management Team (USDI FWS 2009b).

### *Ongoing Recreation Issues on Federally Managed Lands*

Population growth, development, proximity of urban areas to public lands, and growing popularity of outdoor recreation have translated into a high demand for a variety of recreational opportunities on Federal lands and waters. Over the past four decades, forms of motorized recreation such as OHVs, snowmobiles, and personal watercraft, as well as other recreational activities such as mountain biking and hang gliding, have gained in popularity. These newer forms of recreation intersect with more traditional forms of recreation such as fishing, canoeing, bird watching, hiking, horseback riding, hunting, and camping. Use of OHVs on Federal lands has been particularly contentious with critics raising concerns over potential damage to wildlife habitat and land and water ecosystems and diminished experience for recreationists seeking quiet and solitude (Calvert and others 2010). Despite differences in management objectives, topography, and recreation resources agencies are faced with many common issues. They struggle with needs for adequate facilities, funding, law enforcement, and staff. At the same time they must balance the demands of an ever increasing, dynamic population with stewardship of the various natural and cultural resources under their management. As the recreational preferences of the public evolve with greater interests in activities such as climbing, driving, and organized events, increased planning, education, and enforcement are required for effective management.

## Regional Trail Planning and Outreach

Partnerships between agencies (Federal, state, regional, and local), non-profits, businesses, individual citizens, and community partners played a critical role in the establishment and management of trails in southern Nevada. An interest in preserving open space and in development of interconnecting trails has evolved over the past decade due primarily to the region's population explosion and a desire for improving quality of life. The proposed 113-mile Vegas Valley Rim Trail would serve to bind many land management areas, recreational destinations, municipalities, and agencies together (Baca 2010; Reardon, personal communication, 2011b).

Because of its proximity and access to public lands, Las Vegas Valley is gaining recognition as an outdoor recreation destination. The Cities of Las Vegas and Henderson have both completed open space planning efforts. The ultimate goal of these plans is to create and maintain a world-class, interconnected open space and trails system through the action of citizens, the business community, and city, county, state, and Federal agencies. These municipal plans are designed to provide a ring of open space and wildlands that will encircle the Greater Las Vegas area and protect scenic, ecosystem, and cultural resources (City of Henderson 2005; Clark County 2009).

Most of the corridor rests on BLM-managed lands, suggesting the need for continual coordination between the local communities and the Federal agencies. Lands being considered in the plan are outside the congressionally defined land disposal boundary and are primarily BLM-managed lands that are not congressionally designated for conservation. Given the possibility that the disposal boundary might be expanded as it has in the past, those public lands with the highest resource values could remain in public ownership or in some other form of protection to protect recreational opportunities in addition to conserving resource values. Lands bordering Las Vegas Valley that are designated for conservation by Congress include the Desert NWR, Lake Mead NRA, Sloan Canyon NCA, and Red Rock Canyon NCA (Clark County 2009). Lands designated locally for conservation include the Rainbow Gardens and River Mountains Areas of Critical Environmental Concern (BLM) and the Boulder City Conservation Easement (Boulder City and Clark County).

## Knowledge Gaps and Management Implications

Southern Nevada's rapidly increasing population has resulted in an increase in recreational demands on public lands, while an associated shift in demographics has altered recreation tastes and preferences. There are changes in visitor types to a more urban population who expect more expensive recreation enhancements such as full-service camping facilities. In addition, an increasing number of visitors come from a wide range of cultural backgrounds. For example, subtle differences in leisure time preferences of Hispanics distinguish them from other ethnicities, and understanding such differences is a critical factor in serving the increasing Hispanic population (Adams and others 2006). Many new residents have recently migrated from other countries where English is not the primary language and who may or may not have experience with the traditional forms of recreation highlighted in this report. These changes to the profile of recreation in the area emphasize the need for additional information and management strategies to meet future demands and trends. Managers will need to plan for changes in facilities and recreation area emphases as well as additional education strategies to accommodate these new visitor preferences and types.

Stemming in part from southern Nevada's population expansion, there is an accelerated impact on natural, cultural, and scenic resources. Although some impacts are being recorded through resource monitoring, it is not fully known if they are related to recreation use. In addition, protection and conservation of water resources must be considered owing to competing interests and conflicting demands of recreationists. Identification and protection of these resources need to be undertaken and accounted for in management plans. Public education and law enforcement are essential components of this process.

Increased urbanization and development adjacent to public lands provide the southern Nevada population with easy access to nearby public lands for recreation. As off-highway vehicle (OHV) use and recreational climbing gain in popularity, research is needed to

identify the potential impacts of such activities (SNAP 2011b). These are forms of recreation that impact the environment and are a common concern of the agencies managing public lands. Research is needed to identify recreation trends on public lands and ways to meet the needs and demands of recreationists without compromising the resources (SNAP 2011b).

Recreational use of all-terrain vehicles (ATVs) has resulted in an increase in vandalism and illegal looting (unauthorized excavation and removal of artifacts) on cultural sites that were previously inaccessible ( NVSHPO 2004). These remote areas, once protected by distance, are now within easy reach of the off-road vehicle user and well-equipped urban/suburban resident. Cultural resource professionals look for positive effects from their heritage education programs. They believe that such education has the potential to reduce negative impacts and inadvertent damage from recreational use on public lands by making the public aware of the fragility and uniqueness of the resource. Frustration remains over insufficient funding for law enforcement and management actions such as closure of roads and trails or construction of physical barriers for prevention of site damage (Jarvis 2006).

Changes in communication technology have affected how people get information regarding potential visits to recreation areas and associated activities. For instance, visitor guides are now available online. "Online meet-up groups are a new way people find out about hikes and may be taking the place of commercial operators or demand for agency led activities. Understanding the volume of visitation, providing information to leaders to ensure resource damage is avoided, etc. is all needed" (Ronning, personal communication). There is a trend for recreationists to desire enhanced interactive interpretive and educational programs as well as upgraded visitor centers. Funding and staffing of recreation areas and facilities must be sufficient to keep pace with these increasing demands.

Administrative and political pressures on agencies that divert effort away from activity that directly benefits ecosystems affect long-term effective management of the land. Loss of landscape knowledge when agency staffs are transferred to other locations is another serious problem. Other needs are interagency cooperation and education of recreation visitors. Lack of resources such as staffing, infrastructure, and budget affect the ability of agencies to manage southern Nevada ecosystems (Lancaster and others 2006).

Southern Nevada's growing population influences recreation activity on Federal lands and impacts the area's natural resources. The State of Nevada, with its great proportion of public lands, is blessed with an abundance of natural resources. The parks and open spaces of southern Nevada are valued as popular recreation and tourist destinations for Nevadans and visitors to the Las Vegas metropolitan area (DeLoney 2004). While these areas are beneficial to human populations as healthy retreats from urban life, they are essential as habitat for many native species of flora and fauna. Therefore, it is imperative to consider the effects of increasing recreation demands on natural resources. Cooperation and collaboration among the four Federal land management agencies and with southern Nevada's adjacent communities is necessary to achieve the goals of promoting natural and cultural resource stewardship while providing appropriate and sustainable recreation opportunities (SNAP 2002).

# References


Adams, L.; Baskerville, K.; Lee, D.; Spruiell, M.; Wolf, R. 2006. The Hispanic community and outdoor recreation. March 22, 2006. Presented to Outdoor Industry Foundation by UCLA Anderson School of Management Research Program. 51 p.

Baca, M. 2010. Historical context for the "Great Circle." Unpublished draft on file at: Outside Las Vegas Foundation, Las Vegas, NV.

Calvert, K.; Vincent, C.H.; Gorte, R.W. 2010. Recreation on Federal lands. Congressional Research Service Report for Congress. 7-5700 www.crs.gov RL 33525. 24 p.

City of Henderson. 2005. Open space and trails plan: adopted December 6, 2005. Henderson, NV: Community Development Department. Online: http://www.cityofhenderson.com/community_development/open_space_and_trails_plan.php [2011, May 5].

Clark County. 2009. Las Vegas Valley perimeter open space plan—Phase 1: Open space locations and Vias Verdes report. Las Vegas, NV: Clark County Department of Air Quality and Environmental Management and the Department of Comprehensive Planning. 48 p. Online: http://www.clarkcountynv.gov/Depts/comprehensive_planning/advanced_planning/Documents/LVVPerimeterPhase1Report.pdf [2012, Nov 16].

Clark County School District (CCSD). 2010. Clark County School District Accountability Report 2009-10 School Year.: 3,13. Online: http://ccsd.net/schools/pdf/acc_pdfs_2010/districtAcc2009-2010.pdf [2012, Nov 19].

DeLoney, J.A. 2004. Nevada's 2003 statewide comprehensive outdoor recreation plan – assessment and policy plan. Carson City, NV: Nevada Division of State Parks, Department of Conservation and Natural Resources. 288 p.

Graefe, A. R.; Holland, J. 1997. An analysis of recreational use and associated impacts at Lake Mead National Recreation Area: a social and environmental perspective. U.S. Department of the Interior, National Park Service, Lake Mead Recreation Area. On file at: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Albuquerque, NM. 9 p.

Holland, J. 2011. Personal communication. [E-mail to Deborah Reardon forwarded to Carol Raish]. August 4. On file at: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Albuquerque Laboratory, Albuquerque, NM; RMRS-4853 files.

Jarvis, T.D. 2006. Cultural resources on the Bureau of Land Management public lands: an assessment and needs analysis. Washington, DC: National Trust for Historic Preservation. 36 p.

Lancaster, J.; Mouat, D.; Buck, P. (eds.). 2006. Information needs and state-of-the-science summary developed for the ecosystem health assessment of southern Nevada project. Report on First Workshop—May 3-4, 2006. Reno, NV: Desert Research Institute. 31 p.

Nevada State Historical Preservation Office (NVSHPO). 2004. Nevada Comprehensive Preservation Plan 2003. Online: http://nvshpo.org/dmdocuments/HPPlan03.pdf [2012, Nov 15].

Reardon, D. 2011a. Personal communication. [E-mail to Carol Raish]. September 14. On file at: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Albuquerque Laboratory, Albuquerque, NM; RMRS-4853 files.

Reardon, D. 2011b. Personal communication. [E-mail to Alice McSweeney]. October 13. On file at: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Albuquerque Laboratory, Albuquerque, NM; RMRS-4853 files.

Ronning, C. 2012. SNAP review team. March 2. On file at: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Albuquerque Laboratory, Albuquerque, NM; RMRS-4853 files.

Sable, J.; Plotts, C.; Mitchell, L. 2010. Table A-1. In: Characteristics of the 100 Largest Public Elementary and Secondary School Districts in the United States: 2008–09 (NCES 2011-301). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office. P A-4. Online: http://nces.ed.gov/pubs2011/2011301.pdf [2012, Nov 19].

Southern Nevada Agency Partnership (SNAP). 2002. Interagency recreation team charter. On file at: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Albuquerque Laboratory, Albuquerque, NM. 6 p.

Southern Nevada Agency Partnership (SNAP). 2010. Southern Nevada visitor use monitoring. Understanding visitors to public lands in Clark County, Nevada. Southern Nevada Agency Partnership Recreation Team. On file at: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Albuquerque, NM. 4 p.

Southern Nevada Agency Partnership (SNAP). 2011a. Wilderness Team Accomplishments. Online: http://snap.gov/projects/wilderness/accomplishments.cfm [2011, Oct 6].

Southern Nevada Agency Partnership (SNAP). 2011b. Science and research needs assessment, 2011. Science and Research Team.

Southern Nevada Agency Partnership (SNAP). 2011c. OHV guide to public lands within Clark County. Online: http://www.snap.gov/upload/OHV-Brochure-Web-120327.pdf [2012, Nov 19].

Street, B. 2011. Statistical abstract: 2010. Natural Resource Data Series NPS/NRPC/SSD/NRDS--2011/147. Fort Collins, CO: U.S. Department of the Interior, National Park Service, Natural Resource Program Center. 74 p. Online: www.nature.nps.gov/socialscience/docs/PUSO_Abstract_2010.pdf [2012, Nov 19].

Turner, K.; LaVoie, A.M.; Ronning, C.J.; Sharp, R.M.; Palmer, C.J.; Miller, J.M. 2009. SNAP Science and Research Strategy (Strategy). Southern Nevada Agency Partnership. Online: http://snap.gov/upload/SNAP-S-R-Strategy-2009r.pdf [2012, June 5].

U.S. Census Bureau. 2011a. Population distribution and change: 2000 to 2010. Online: http://www.census.gov/prod/cen2010/briefs/c2010br-01.pdf [2012, Nov 19].

U.S. Census Bureau. 2011b. U.S. Census Bureau delivers Nevada's 2010 census population totals, including first look at race and Hispanic origin data for legislative redistricting. Online: http://2010.census.gov/news/releases/operations/cb11-cn51.html [2012, Nov 19].

U.S. Census Bureau. 2012. Clark County quick facts. Online: http://quickfacts.census.gov/qfd/states/32/32003.html [2012, Nov 19].

USDA Forest Service. 2006. National visitor use monitoring results for Spring Mountains National Recreation Area. Single Agency Report. Southern Nevada Agency Partnership, Southern Nevada Visitor Use Monitoring. U.S. Department of Agriculture, Forest Service, Region 4. On file at: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Albuquerque, NM. 43 p. Online: http://www.fs.fed.us/recreation/programs/nvum/reports/year5/spring_mt_nra.htm#_Toc148252978 [2012, Nov 19].

USDA Forest Service. [n.d.a]. General management plan for the Spring Mountains National Recreation Area. Online: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5143059.pdf [2011, October 6].

USDA Forest Service. [n.d.b]. Spring Mountains National Recreation Area 2009-2010 visitor guide. Las Vegas, NV: U.S. Department of Agriculture, Forest Service, Humbolt-Toiyabe National Forest. Online: https://fs.usda.gov/Internet/FSE_DOCUMENTS/fsm9_026404.pdf [2011, April 29].

USDI Bureau of Land Management. 2009. Sloan Canyon National Conservation Area trails master plan. Final Environmental Assessment. Las Vegas, NV: U.S. Department of the Interior, Bureau of Land Management, Red Rock-Sloan Field Office. 199 p. Online: http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/blm_special_areas/sloan_canyon_nca/sloan_canyon_nca_trails.html [2012, Nov 19].

USDI Bureau of Land Management. 2001. National management strategy for motorized off-highway vehicle use on public lands. Washington, DC: U.S. Department of the Interior Bureau of Land Management.

USDI Bureau of Land Management. 2010a. Red Rock Canyon National Conservation Area final business plan. Las Vegas, NV: U.S. Department of the Interior, Bureau of Land Management, Southern Nevada District Office. 87 p. Online: http://www.blm.gov/pgdata/etc/medialib/blm/nv/field_offices/las_vegas_field_office/red_rock/red_rock_business/2010_final_red_rock.Par.24616.File.dat/RRBP-2010_final-online.pdf [2012, Nov 19].

USDI Bureau of Land Management. 2010b. Sloan Canyon National Conservation Area. [Homepage of Sloan Canyon NCA]. Department of the Interior, Bureau of Land Management, Southern Nevada District Office, Sloan Canyon National Conservation Area. Online: http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/blm_special_areas/sloan_canyon_nca.html [2011, April 4].

USDI Fish and Wildlife Service. 2005. Desert National Wildlife Refuge. Las Vegas, NV: U.S. Department of the Interior, Fish and Wildlife Service, Desert National Wildlife Refuge. oOnline: http://www.fws.gov/desertcomplex/desertrange/reference.htm [2011, May 20].

USDI Fish and Wildlife Service. 2009a. Desert National Wildlife Refuge Complex: Final comprehensive conservation plan and environmental impact statement summary—August 2009. Sacramento, CA: U.S. Department of the Interior, Fish and Wildlife Service, Pacific Southwest Region. 42 p. Online: http://www.fws.gov/desertcomplex/ccp.htm [2011, April 4].

USDI Fish and Wildlife Service. 2009b. Desert National Wildlife Refuge Complex: Final comprehensive conservation plan and environmental impact statement volume I—August 2009 and volume II (appendices). Sacramento, CA: U.S. Department of the Interior, Fish and Wildlife Service, Pacific Southwest Region. 359 p.

USDI Fish and Wildlife Service. 2011a. Ash Meadows National Wildlife Refuge. Sacramento, CA: U.S. Department of the Interior, Fish and Wildlife Service, Pacific Southwest Region. Online: http://www.fws.gov/desertcomplex/ashmeadows/ [2011, April 4].

USDI Fish and Wildlife Service. 2011b. Desert National Wildlife Refuge. Sacramento, CA: U.S. Department of the Interior, Fish and Wildlife Service, Pacific Southwest Region. Online: http://www.fws.gov/desertcomplex/desertrange/ [Date accessed: April 4, 2011].

USDI Fish and Wildlife Service. 2011c. Moapa Valley National Wildlife Refuge. Sacramento, CA: U.S. Department of the Interior, Fish and Wildlife Service, Pacific Southwest Region. Online: http://www.fws.gov/desertcomlex/moapavalley/ [2011, April 4].

USDI Fish and Wildlife Service. 2011d. Pahranagat National Wildlife Refuge. Sacramento, CA: USDI Fish and Wildlife Service, Pacific Southwest Region. Online: http://www.fws.gov/pahranagat/ [2011, April 4].

USDI National Park Service. 2009. Southern Nevada Visitor Use Monitoring—Southern Nevada application. Comparison of Lake Mead and Lake Mojave in Clark County, NV. Single Agency Report. Southern Nevada Agency Partnership, Southern Nevada Visitor Use Monitoring. U.S Department of the Interior, National Park Service. On file at: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Albuquerque, NM. 76 p.

USDI National Park Service. 2011a. Lake Mead Recreation Area. U.S. Department of the Interior, National Park Service. Online: http://www.nps.gov/lake/index.htm [2011, April 18].

USDI National Park Service. 2011b. Lake Mead Recreation Area. U.S. Department of the Interior, National Park Service. Online: http://www.nps.gov/lake/parkmgmt/park-management-plans.htm [2011, October 6].

USDI National Park Service. 2011c. Lake Mead Recreation Area: Park management plans. U.S. Department of the Interior, U.S. National Park Service. Online: http://www.nps.gov/lake/parkmgmt/docs.htm [2011, October 6].

Western Rural Development Center (WRDC). 2011. Trends in the western U.S. population brief. A Western Rural Development Center publication. Online: http://wrdc.usu.edu/htm/regional-data/nevada [2012, Nov 19].

Yost, A. 2012. SNAP review team. [Personal communication]. March 8. On file at: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Albuquerque Laboratory, Albuquerque, NM; RMRS-4853 files.