



Mojave National Preserve

Jin André



Rob Fulton

Lake Tuendae, on the edge of Soda Dry Lake, provides a stunning backdrop for California State University's Desert Studies Center.

Welcome to Mojave

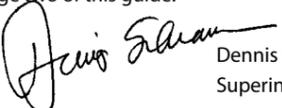
As the new superintendent of Mojave National Preserve I want to extend my personal welcome and my hope that your visit will be rewarding. Rangers here are about the friendliest and most knowledgeable around—in fact, in our latest visitor survey, they achieved a 99% good or excellent visitor satisfaction rate. Rangers are eager to help you plan your visit and share their excitement and knowledge, so please ask them.

You will soon find that this Preserve protects a vast area of the Mojave Desert ecosystem and offers opportunities to enjoy a variety of unique desert environs, including: sand dunes, Joshua tree forests, cactus gardens, cinder cones, quiet canyon hikes, backcountry road trips by four-wheel-drive, and visits to old mines and military outposts. Campers will experience the dark night sky and see an amazing number of stars.

Cooler fall temperatures make this a great time of year to drive out to the desert, and the newly opened Kelso Depot Visitor Center is a great destination for a day-trip. The renovation and re-opening of this marvelous building could not have happened without the efforts of people and organizations from across the region. Former railroad employees, local tribes, and many others contributed to the exhibits. I encourage everyone to see this desert landmark.

This year, Mojave had its share of wildfires that were quickly attacked and extinguished by interagency fire crews. In July alone there were 22 fire starts! If you visit Mid Hills or Hole-in-the-Wall you'll still see the remnants of last year's Hackberry Complex of Fires that burned nearly 80,000 acres. Spring brought a profusion of wildflowers in the burn areas, and bitterbrush and banana yucca are vigorously re-sprouting from old stems. While this is encouraging, it will be decades before the pinyon and juniper forest that used to cover these slopes returns. Several research projects are underway to learn as much as we can about the recovery process here.

Many adventures await you at Mojave National Preserve. I encourage you to experience the diversity of the desert by taking short walks in various habitats. If you would like to learn more about park resources or management activities, stop by the Kelso Depot, visit our website, or call the headquarters information number listed on page two of this guide.


Dennis Schramm
Superintendent

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Desert Studies Center Celebrates 30 Years at Zzyzx

By Rob Fulton, Manager, CSU Desert Studies Center
IN LATE 1974, A FEW VISIONARY PROFESSORS from the California State University system (CSU) saw an opportunity to enhance education and research in natural environments. The opportunity took the form of an abandoned mineral springs resort on the shore of Soda Dry Lake, now in Mojave National Preserve. At that time, the former Zzyzx Mineral Springs Resort was under the jurisdiction of the Bureau of Land Management (BLM), who had sought the removal of the resort's developer, Curtis Howe Springer, when it was determined that his operations illegally occupied federal land under mining claims.

The BLM's dilemma was what to do with the ecologically and culturally rich oasis, with all its exceptional wetlands and other diverse habitats, historical

remains, and resort developments, at a time of increasing awareness of ecological issues and their importance to a rapidly growing population. A critical part of the mix was the presence of a minnow in the man-made ponds at Zzyzx, the Mohave tui chub, which had recently been listed as an endangered species.

Several groups and organizations showed an interest in the site and made proposals for its use. The BLM even considered bulldozing the buildings and trying to rehabilitate the area to "natural" conditions. Eventually, the BLM declared the site an "Area of Critical Environmental Concern," and determined that CSU's proposal for a teaching and research facility was most compatible with their management goals of protecting the natural and cultural resources of

the unique oasis, while still allowing for public access and appreciation.

Thus it was, in July of 1976, that CSU and BLM signed a Cooperative Agreement outlining shared management of the site. The University formed the California Desert Studies Consortium to act as the governing body for the operations of the newly established Desert Studies Center (DSC), drawing modest funding and board members from seven of the university's campuses in Southern California. A director was elected, a small staff hired, and the daunting task of bringing the facilities up to standards began.

Most of the infrastructure of the old Zzyzx Mineral Springs Resort was in disrepair, vandalized, or did not meet (continued on page 4)

3 Turtle & Tortoise

The desert tortoise and the loggerhead sea turtle are both threatened species. Learn about the similarities and differences between these two fascinating reptiles.

4 Fire in the desert

Lightning strikes during the summer of 2006 kept Mojave interagency fire crews busy. Fire fighters responded to 29 fires inside park boundaries, and more than 30 additional fires across the desert.

4 The desert deer hunt

Desert deer hunting is challenging, but has its own rewards.



National Park Service
U.S. Department of the Interior

Mojave National Preserve

Established in 1994, Mojave National Preserve encompasses 1.6 million acres ranging in elevation from 800 feet near Baker to 7,929 feet at Clark Mountain. Here, three of the four major North American deserts meet. Although most of the park lies in the Mojave Desert, the southeast section grades into Sonoran Desert, and elements of the Great Basin Desert are found at higher elevations east of the Granite, Providence and New York Mountains.

Superintendent
Dennis Schramm

Chief Ranger
Denny Ziemann

Chief, Resource Interpretation (Acting)
Linda Slater

Contact Information

Mailing Address
2701 Barstow Road
Barstow, CA 92311

E-mail
Click on "Contact Us" at nps.gov/moja

Park Headquarters
760 252-6100

Fax Number
760 252-6174



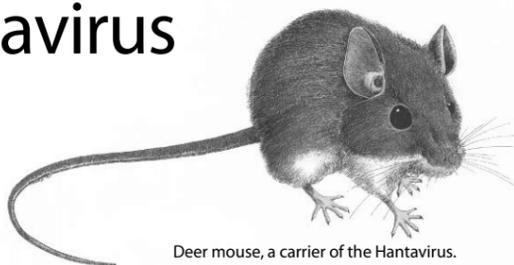
Kelso Depot Visitor Center

Built in 1924, the Kelso Depot was used as a train station, employee housing, and restaurant by the Union Pacific Railroad. The building shut down completely in 1985.

Recently renovated, the Depot has re-opened as the new Visitor Center for Mojave National Preserve. The building now houses an information desk, bookstore, and exhibits describing the natural world of the desert and the people who have lived and worked here.

Kelso Depot Visitor Center is open from 9 a.m. to 5 p.m. daily except Christmas Day.

Hantavirus Alert



Deer mouse, a carrier of the Hantavirus.

Hantavirus pulmonary syndrome is a respiratory disease caused by a virus shed by deer mice and other rodents. The disease is extremely rare, but very serious: there is no cure, and nearly half of the known patients have died.

The risk of exposure is highest in rural areas, especially in abandoned cabins where rodents are present. Hantavirus has now been reported in 31 states.

The disease spreads to people when rodent urine, droppings, or nesting materials are stirred up. You may be infected by breath-

ing in the virus, touching your mouth or nose after handling contaminated materials, or from a rodent bite.

Symptoms include fatigue, fever and muscle aches, followed by coughing and shortness of breath as the lungs fill with fluid.

To avoid exposure to hantavirus, use extreme caution when exploring abandoned buildings. If you see droppings or nests, stay away. Don't camp in areas where rodent droppings are present.

Temperatures: Average high/low in degrees Fahrenheit

	Granite Mountain Elevation 4,200 feet	Zzyzx Elevation 930 feet
January	50/36	61/34
February	54/38	69/40
March	59/41	74/46
April	68/48	83/53
May	75/54	93/61
June	85/63	103/70
July	90/67	109/77
August	89/66	107/75
September	83/61	100/68
October	73/52	77/55
November	59/41	73/43
December	50/34	62/34
Average Annual Precipitation	8.5 inches	3.37 inches

Information

Entrance Fee

There is currently no entrance fee for Mojave National Preserve.

Dates and Hours of Operation

Mojave National Preserve never closes. Two information centers offer orientation and maps.

Kelso Depot Visitor Center

Located 35 miles south of Baker on Kelbaker Road. Open daily 9 a.m. to 5 p.m., except Christmas Day. Phone 760 733-4456.

Hole-in-the-Wall Information Center

Located near Hole-in-the-Wall Campground. Winter hours (October through April) Wednesday through Sunday from 9:00 a.m. to 4:00 p.m. Summer hours (May through September) Friday through Sunday, 9:00 a.m. to 4:00 p.m. Phone 760-928-2572.

Gasoline

There are no gas stations in the park, so be sure to fill up before entering. Gas is sold along I-40 at Needles, Fenner, and Ludlow, along I-15 at Baker, Cima Road, and Primm, and along U.S. 95 at Searchlight and at the Nevada 163 junction south of Cal Nev Ari.

Water

Always carry plenty of drinking water in your car and especially when hiking. The only drinking water available within the park is at Kelso Depot Visitor Center, Hole-in-the-Wall and Black Canyon Campgrounds, and at the Providence Mountains State Recreation Area (Mitchell Caverns) Campground.

Lodging

There are no motels within the park. Lodging can be found in Barstow, Nipton, Ludlow, Needles, and Baker, and Twentynine Palms, California, and in Primm and Searchlight, Nevada.

Permits

Recreation Permit \$50.00

A Recreation Permit is required for all organized events, including school groups, hiking clubs, jeep tour groups and scouting groups, or for any group of more than 15 individuals or 7 vehicles. Proof of insurance may be required. For more information, call (760) 252 6107, or click on "Permits" at nps.gov/moja.

Special Use Permit \$200.00

A Special Use Permit is required for large, organized events and commercial activities such as filming. Proof of insurance and posting of a bond may also be required. For more information, call (760) 252-6107, or click on "Permits" at nps.gov/moja.

Weather

Expect wide fluctuations in day-night temperatures, seasonal strong winds, and bright, clear skies. At low elevations, temperatures above 100 degrees F. typically begin in May and can last into October. Annual precipitation ranges from 3.5 inches at low elevations to nearly ten inches in the mountains. Most rain falls between November and April; summer thunderstorms may bring sudden heavy rainfall and flash flooding. Strong winds occur in fall, late winter, and early spring.

Telephone & Web Directory

Emergency	911	
Emergency: Interagency Communications Center		909-383-5651
San Bernardino County Sheriff - Baker		760-256-1796
- Needles		760-326-9200

Mojave National Preserve

Barstow Headquarters Office	760-252-6100
Hole-in-the-Wall Fire Center	760-928-2573
Hole-in-the-Wall Information Center	760-928-2572
Kelso Depot Visitor Center	760-733-4456
Kelso Ranger Station	760-733-4011

Nearby parks

Anza Borrego Desert State Park	760-767-4205
Calico Ghost Town	760-254-2122
Death Valley National Park	760-786-2331
Joshua Tree National Park	760-367-5500
Lake Mead National Recreation Area	702-293-8990
Mitchell Caverns/Providence Mountains State Park	760-928-2586

Mojave National Preserve	www.nps.gov/moja
National Park Service	www.nps.gov
Bookstore (Western National Parks Association)	www.wnpa.org
CSU Desert Studies Center	http://biology.fullerton.edu/facilities/dsc/zzyzx.html
Bureau of Land Management	www.blm.gov
California Desert	www.californiadesert.gov
Leave No Trace	www.lnt.org
Mitchell Caverns/Providence Mtns. State Park	www.calparksmojave.com/providence
Wilderness System information	www.wilderness.net
Federal government jobs	www.usajobs.opm.gov
Desert USA wildflower reports	www.desertusa.com/wildflo/wildupdates

An uncertain future for two ancient species

By Hilary Clark, Park Ranger

THE DESERT TORTOISE (*GOPHERUS agassizii*) and the loggerhead sea turtle (*Caretta caretta*) both share a 340 million year evolution, and also a threatened status which leaves them with a precarious future.

In California and Arizona, tortoises construct their burrows in both the Mojave and Sonoran Deserts. Along the eastern beaches from New Jersey to Texas, sea turtles lay and bury their eggs in the sand. Unprecedented development in desert communities and oceanfront properties has meant that both desert tortoises and loggerhead sea turtles have fewer places to live and reproduce. When tortoises cross roads which dissect desert land, they can be crushed by vehicles, just as over-sand trucks kill sea turtle hatchlings along barrier island beaches. Tire ruts may further prevent hatchlings from reaching the ocean. Loss of habitat and indiscriminate vehicle use are only a few of the threats to these reptiles; they face a myriad of complicated obstacles to their continued survival.

Although linked by their vulnerability, the two reptiles are separated by their physiological differences. A desert tortoise may weigh nine pounds and live for 80 years whereas a sea turtle can reach 900 pounds and live to be 100. The desert tortoise has columnar legs with heavy claws, while sea turtles have streamlined bodies and powerful flippers. Desert tortoises thrive on flowers, leaves, cacti and grasses, whereas loggerheads feast on crabs, mollusks, and jellyfish. Both have unique mechanisms for surviving extreme environments, from the ocean depths to the rugged, arid deserts. The blood of a sea turtle can quickly replace oxygen to major tissues at extreme underwater depths.



above: the loggerhead sea turtle makes a slow return to the ocean after laying eggs on the beach.
right: the desert tortoise contends with the encroachment of people into its habitat.



Desert tortoises can store water in the bladder as an internal reserve.

Both have a carapace, which is the upper half of their shell, connected to a plastron, the lower half. The desert tortoise has an elongated bony area called the gular horn which the male uses to prove his prowess as a mate. The tortoise will lay from three to five eggs in a clutch, whereas loggerheads can have as many as 50 to 300 eggs.

Sea turtle eggs, protected under beach sand, are sensitive to any temperature changes which can result from raking, beach nourishment (dumping additional sand on beaches), and other human disturbances. Artificial light can disorient sea turtle hatchlings away from the ocean and lead to their death. Desert tortoise hatchlings are equally vulnerable as prey for coyotes, golden eagles, kit foxes, and especially ravens, whose numbers are increasing dramatically because they scavenge at dumpsters and other concentrations of garbage. Sea turtle hatchlings float among sargassam weed and debris in hopes of staying concealed from potential predators. Unlike the desert tortoise, they cannot

hide their head underneath their shell. As they age, sea turtles risk entanglement in fishing lines and trawlers. Autopsies on sea turtles show many a death that result from consumption of plastic bags which they perceive as jellyfish.

Pollutants in ocean waters are as detrimental to sea turtles as releasing pet tortoises is to wild desert tortoises. Contact with people exposes pet tortoises to a fatal upper respiratory disease which can then be spread to wild tortoises. With so many threats, populations of both the desert tortoise and the sea turtle have been declining; both are now under the protection of the Endangered Species Act, described by the US Fish and Wildlife Service as the "last barrier to extinction." National Park Service areas like Mojave National Preserve in California and Gulf Islands National Seashore in Florida provide protected habitat for these vulnerable creatures. Yet, preserves and parks cannot ensure the survival of a species. Volunteers participate heavily in monitoring sea turtle nesting; in the Mojave Desert it is critical that the public understand how their actions can effect the desert tortoise.

Protect the Desert Tortoise

Do not pick up or harass a tortoise: observe it from a distance. Tortoises store water in their bladders and can re-absorb the liquid during a drought. When frightened, they frequently empty their bladders. Loss of this important water source can be fatal.

Check under your vehicle before driving away. Tortoises enjoy the shade under your car on a hot day.

Observe posted speed limits, and be especially watchful during and after rainstorms, when tortoises often enter roadways to drink from puddles.

Keep vehicles on established roads only. Vehicles will crush tortoise burrows, killing the tortoises and eggs within.

Do not release captive tortoises. They may carry diseases that can be transmitted to wild tortoises. Instead, turn them in to a licensed tortoise rescue center. For information, call 760-252-6101.

Barstow students help protect the desert tortoise

FIRST GRADERS AT LENWOOD ELEMENTARY SCHOOL NEAR Barstow, California, raised \$214 to buy an acre of land to donate to Mojave National Preserve by collecting aluminum cans and plastic bottles to recycle. For the students, the goal was to insure the protection of desert tortoise habitat, after learning that loss of habitat to development was one of the many threats contributing to the decline of desert tortoise populations.

"With their effort, coupled with an \$86 contribution from San Bernardino County's waste management department, we presented a check for \$300 to the National Park Service to add a little bit of land to the Preserve," teacher Ginger O'Brian said. "Eighty students in four classrooms collected the recyclables. It was part of our program to teach children to understand and appreciate the desert. Hopefully they will continue this appreciation throughout their lives."

Since Mojave National Preserve was established in 1994, there has been a continuing effort by private citizens and non-profit organizations to purchase private lands within the park's boundaries and donate the lands to the National Park Service to create a more cohesive park. Private land acreages within Mojave have dropped from 220,000 in 1994 to just under 100,000 acres today.

Lenwood teachers Ginger O'Brian, Wendi Matley, Melissa Moor and Debbie Williams spearheaded the project, which was just one component of their conservation education program.

Dirt Road Driving

Driving tips for sand and mud

- Use low gearing and just enough throttle to maintain forward movement
- Engage 4-wheel drive before entering deep sand or mud.
- Turn the steering wheel rapidly from side-to-side if you sense a loss of traction. This can help to generate traction.
- Don't gun the engine. This will spin the tires and dig you down, not forward, and could bury you to the frame. Smooth, easy power is better than too much power.
- If your vehicle gets stuck, put solid material such as floor mats under tires to gain traction.
- If you are really stuck, it's best to stay with your vehicle since it is much easier to find than someone traveling on foot. Avoid strenuous activity during the heat of the day. Stay in the shade of your vehicle.

Rules of the Road

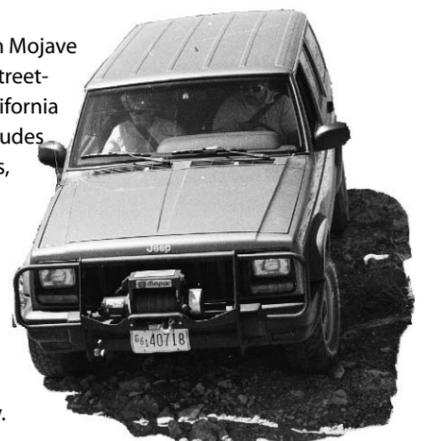
All vehicles operating within Mojave National Preserve must be street-legal in accordance with California DMV requirements. This includes current registration and tags, lights and turn signals, and valid insurance. California "Green Sticker" and "Red Sticker" programs are not recognized within the park.

Road Conditions

Road conditions vary widely. Dirt roads may be rough. Sandy or muddy roads may be impassable, trapping the unprepared motorist many miles from help. Watch for cattle, burros, and wildlife on roadways.

Not all roads are shown on all maps; traces and illegal shortcuts add to the confusion. Carry a good map and ask a park ranger for current road conditions.

Traveling off pavement within the park is allowed only on existing, open dirt roads. Do not



travel cross-country or create new routes. This rule is strictly enforced; citations are issued for violators. Watch for and respect Wilderness Boundary signs; motorized vehicles (and bicycles) are not allowed in Wilderness Areas. Driving in washes is not permitted.

Your Vehicle

Ensure that your vehicle is in good condition. Check your tires, oil, and gas gauge before you leave. Be prepared for an emergency. Carry a tire jack, tools, towrope, and extra water and fluids for your vehicle.



Desert Studies Center celebrates 30 years

(continued from page 1)

codes. Students were enlisted to help with the renovations, guided by carpenters, electricians and plumbers from California State University Fullerton, which eventually became the DSC's home campus. Although some teaching, research and public tours began shortly after its establishment, much of the activity during the DSC's first decade involved scraping, painting, re-roofing, window replacement, wire pulling, re-plumbing, and the construction of a laboratory and restroom/showers facility.

As it celebrates its 30th year, the DSC has become a world-class desert field station, with students and researchers coming from all over North America, and even Europe, giving students the opportunity for learning beyond the classroom, and researchers a support facility while working in remote areas. The DSC staff welcomes the public for day visits, or to take numerous classes on weekends through university extended education courses.



Rob Fulton

top: Students from California State University Fullerton install CSU's first entrance sign in 1976. bottom: Archaeology students from University of Nevada sift through material excavated from a cultural site at Desert Studies Center.

Gone are the days of intermittent power from generators, lack of climate control in the buildings, and the use of outdoor showers and porta-potties. Today, guests are treated to cooled or heated rooms, flush toilets and hot showers, catered meals, 24-hour electricity from the Center's solar power plant, modern teaching and lab facilities, a library and even wireless internet access via satellite. For more information on the Desert Studies Center, or to register for a class, visit <http://biology.fullerton>.

Summer lightning strikes kept Mojave fire crews busy



Tim Duncan

Fire burns through Joshua trees on Cima Dome during the Valley Wells fire. The blaze was quickly contained with only 70 acres burned.

LIGHTNING STRIKES FROM EARLY JULY TO early August started 29 separate fires in Mojave National Preserve. Fire crews were able to keep the fires from spreading, with only about 1,500 acres burned.

Other parts of the Mojave Desert experienced large fires due to dried vegetation left over from the spring of 2005, when record-setting rainfall led to a tremendous growth of plants, especially fast-growing annuals. When these plants die, their dried stems and leaves create a carpet of fuel across the landscape that has the potential to carry fire for long distances.

Due to the extreme fire potential, Fire Management Officer Chuck Heard brought in additional fire fighters to support the two Mojave engine crews stationed at Hole-in-the-Wall. Engines from the Bureau of Land Management in Las Cruces, New Mexico, Santa Monica National Recreation Area, and San Luis National Wildlife Refuge in the

San Joaquin Valley, California, rotated through Mojave.

"The fire fighters did a tremendous job of keeping these fires from spreading in spite of the heavy fuel load," said Heard. "The additional crews allowed us to react quickly and keep fire acreages small."

Mojave's largest fire this summer was the Tuff Nut, which burned nearly 1,200 acres high in the Providence Mountains near Tough Nut Spring. Ignited by lightning on July 20, the fire burned on steep slopes about two miles from the nearest road access.

The Valley View fire was ignited by lightning on July 7th, and burned about 70 acres on Cima Dome. "We really appreciate the hard work of our fire crews, especially on the Valley View Fire," said Superintendent Dennis Schramm. "They protected the unique Joshua tree forest on Cima Dome from what could potentially have been a devastating fire."

Park or Preserve? Hunting in Mojave

By Debra Hughson, Science Advisor

It's a preserve, not a park... Hello! So what's the difference? What's in a name? Simply put, you can hunt in a National Preserve but not in a National Park. When you see names like Big Cypress National Preserve or Big Thicket National Preserve, think "hunting season."

Mojave National Preserve has hunting seasons for quail, chukar, doves, cottontail, badger, gray fox, bobcat, mule deer, and bighorn sheep. Seasons for jackrabbits and coyotes are all year. If you're lucky you might draw one of four tags for bighorn sheep and be guided on a big game hunt in the rugged Old Dad and Kelso Mountains.

Five hundred mule deer tags are sold each year on a first-come-first-served basis for Zone D-17, which includes Mojave National Preserve. Mojave is by far the best mule deer hunting area in Zone D-17: very few mule deer are shot in Zone D-17 outside its boundaries. But then very few mule deer are shot in Zone D-17 at all, as compared to other areas of the state. Only 47 mule deer were taken in 2005 from Zone D-17 (46 of which came from within the Preserve), as compared with 3,929 from Zone A in central California west of I-5.

Hunters are also more successful in Zone A (26.9% success), although hunters had more success in Zone D-17 (14% success) than in any of the other desert zones.



Four point buck photographed by motion-sensor camera at a Mojave watering hole.

So what's the attraction for deer hunting in the desert? Besides the unique experience of desert solitude and the beautiful wide-open spaces, the bucks are bigger. Less than 1% of the bucks taken in Zone A had more than 4 antler points on each side while over 4% taken in Zone D-17 were from this point class. Only in the X-zones, along the state's eastern border from Inyo County north, will you have a better chance of bagging a record-sized buck.

So plan your trip well in advance. Obey all laws and regulations, "Leave No Trace," respect Wilderness Areas, practice good sportsmanship, and happy hunting.

Zzyzx buildings date from Doc Springer era



Rob Fulton

Once used as guest rooms at Zzyzx Mineral Springs & Resort, Doc Springer's stucco buildings and palm trees still grace the Boulevard of Dreams, now a part of the CSU Desert Studies Center.

By Anne Maasberg, Park Ranger

Curtis "Doc" Springer was known throughout the Mojave Desert as the builder and proprietor of the Zzyzx Mineral Springs & Resort. In 1944, on a visit to Soda Dry Lake, he felt an immediate affinity to Zzyzx. Recruiting unemployed men and using surplus materials from World War II, Springer made his vision a reality.

Born in 1896, the West Virginia native saw himself as a physician, despite never attending medical school. Springer declared that he had received many an honorary medical degree as well as a Ph.D. A self-proclaimed Methodist minister and health food salesman, Springer was deeply religious.

Starting in 1928, Springer combined his two vocations in creating his own radio show. Throughout the next couple of decades, he sermonized over the airwaves that a healthy lifestyle was the path to spiritual well-being. According to the preacher, the best way a radio listener could improve their physical and spiritual health was to order Springer's "Antediluvian Herb Tea," "Hollywood Pep Cocktail" or one of the other products "Doc" Springer concocted and advertised. Although Curtis Springer left Zzyzx in 1974, his colorful history survives.

Exploring Mojave

Kelbaker Road

"At Kelso, we took on supplies and found that Baker lay just across another small range. There was no road or trail, but once we gained the summit, Baker could be seen in the white alkali sink below. Thirty-six miles away, just twelve merciless hours of walking; and on Armistice Day 1936 we stumbled wearily into Baker."

—Edna Calkins Price, Burro Bill and Me

Today, Kelso and Baker are connected by Kelbaker Road, a paved highway that extends south of Kelso to I-40. The 57 mile drive from I-15 at Baker to I-40 east of Ludlow winds past cinder cones, lava flows, the Kelso Depot and the Kelso Dunes.

Cinder Cones & Lava Flows – 14 miles south of Baker. No signs or services.

Kelbaker Road cuts through an area of thick lava flows intermixed with more than 30 volcanic cinder cones covering an area of 25,600 acres, creating an eerie red-black moonscape. These cones and lava flows are thought to range in age from 10,000 to 7 million years.

In 1973, the area was designated as Cinder Cones National Natural Landmark because of its scenic beauty and exceptional geological value.

Aiken Mine Road (19.5 miles south of Baker) offers an interesting side trip through the heart of the area. High clearance and/or 4x4 vehicles recommended.

Kelso Depot – 34 miles south of Baker. Information Center, exhibits, restrooms, water, picnic tables. Hours listed on page 2.

Built in 1924, the Kelso Depot served as train station, restaurant, and employee housing on the Los Angeles and Salt Lake route of the Union Pacific Railroad. The building is now the park's principal information center and museum. Extensive exhibits describe desert ecosystems, places, people, and history. Historically furnished rooms provide a glimpse into Kelso's past. Rangers show a 12 minute orientation film in the theater.

Kelso Dunes – 43 miles south of Baker, then 3 miles west on a graded dirt road. The dunes are closed to vehicles, but are open to foot traffic. Trailhead, vault toilets, no water.

Kelso Dunes were created by winds carrying sand grains from the dried Soda Lake and Mojave River Sink located to the northwest. In the path of these winds are the Providence and Granite Mountains, barriers that trapped the blowing sand. The entire dune system was created over a 25,000 year time period. The dunes are about 700 feet high and cover a 45 square mile area. Most of the sand grains are made of light-colored quartz and feldspar, which give the dunes an overall golden appearance.

The Kelso Dunes are "booming dunes." They produce a low rumbling sound when sand grains slide down the steep slopes. Sand must have the right moisture content to "boom." Try running downhill to initiate the booming sound.

Granite Mountains – 50 miles south of Baker on Kelbaker Road.

An imposing jumble of granite marks the south entrance to the Preserve on Kelbaker Road. Portions of the Granite Mountains lie within the University of California's Desert Research Center; respect the fencing that marks the boundary.

Cima Dome & Joshua Tree Forest – Along Cima Road between I-15 and Cima. Teutonia Peak Trailhead, exhibits, 12 miles south of I-15



Enticing to children of all ages, granite rock piles abound across Mojave National Preserve.

Zzyzx

Zzyzx/Soda Springs – 6 miles west of Baker on I-15, then 4 miles south on Zzyzx Road (gravel). Vault toilets, non-potable water, picnicking, nature walk.

Historically known as Soda Springs and later renamed Zzyzx (pronounced Zye-Zix), this oasis is home to the California State University Desert Studies Center. Buildings and pond were developed in the 1940s by Curtis Springer, who operated a health resort at the site. Zzyzx is open to the public—stroll around Lake Tuendae and along the shore of Soda Dry Lake. If classes are in session, be courteous and do not disturb participants.

Cima Road

on Cima Road.

A near-perfectly symmetrical dome rises 1,500 feet above the surrounding desert. Although the top of the dome is located west of Cima Road near the Teutonia Peak Trailhead, this unusual geologic feature is best seen from a distance: try the view looking northwest from 2.5 miles east of Kelso Cima Road on Cedar Canyon Road. One of the world's largest and most dense Joshua tree forests grows here.

Cedar Canyon & Black Canyon Roads

Rock Springs – 5.2 miles east of Black Canyon Road on Cedar Canyon Road, then 0.25 mile south on an unmarked dirt road. 4x4 vehicle recommended, or walk in from Cedar Canyon Road. Roadside exhibits.

The spring, nestled in a rocky alcove, was a well-known waterhole for early travelers. Camp Rock Springs, a military "redoubt" established in 1866 to protect travelers and the mail, was one of the most isolated and comfortless army posts in the West.

Mid Hills – 2 miles west of Black Canyon Road on the north end of Wild Horse Canyon Road. Campground, water, vault toilets, trailhead. Not recommended for RVs.

The effects of a fire which swept through here in June, 2005, are still evident. The fire burned through pinyon pine, juniper, and sagebrush.

Hole-in-the-Wall – Just north of the junction of Black Canyon and the south end of Wild Horse Canyon Roads. Information Center (hours listed on page 2), campgrounds, trailhead, restrooms, water, telephone.

Rhyolite cliffs riddled with holes and hollows are the backdrop for Hole-in-the-Wall.

Mojave Road 4 x 4 Route



View from Marl Mountains along the Mojave Road.

"The country, as a whole, seemed a vast volcanic desert—of mountains, canyons, and mesas—and what it was ever made for, except to excite wonder and astonishment, is a mystery to the passing traveler....Water was found only at distances of ten and twenty miles apart..."

—J.F. Rusling describes his 1866 trip on the Mojave Road in Across America.

Used by Indians to transport goods from the southwest to trade with the Chumash and other coastal tribes, this route later served the cause of westward expansion. Military forts were established along the route to protect key water sources and provide assistance for travelers. Today it is a popular four-wheel drive road.

The Mojave Road is an east-west route that enters the park near Piute Spring on the east side and on Soda Dry Lake near Zzyzx on the west. Some sections are rough and sandy; 4 x 4 recommended. Roads can become slick, muddy, and impassable after rains. Be sure to inquire about road conditions, especially if you plan to cross Soda Dry Lake.

The Mojave Road Guide by Dennis Casebier provides in-depth history and mile-by-mile descriptions of the road. It is available for purchase at park information centers.

Clark Mountain

No signs or services. Check detailed maps or ask a ranger for access information. 4x4 vehicles recommended.

The only section of the park north of I-15 is also its highest point at 7,929 feet. A relict white fir grove near the top is one of only three in the Mojave Desert. Rock climbing on existing routes is permitted.

Nipton, Ivanpah, & Lanfair Roads

Hotel Nipton – 11 miles east of I-15 on Nipton Road. Hotel and store are privately operated; call 760 856-2335 for information.

Built in 1910, this charming hotel on the park boundary reflects the railroad, ranching, and mining history of the small community at Nipton.

Caruthers Canyon – 5.5 miles west of Ivanpah Road on New York Mountains Road, then 2.7 miles north on an unsigned road. Primitive camp area, hiking; no signs or services. 4x4 vehicle recommended.

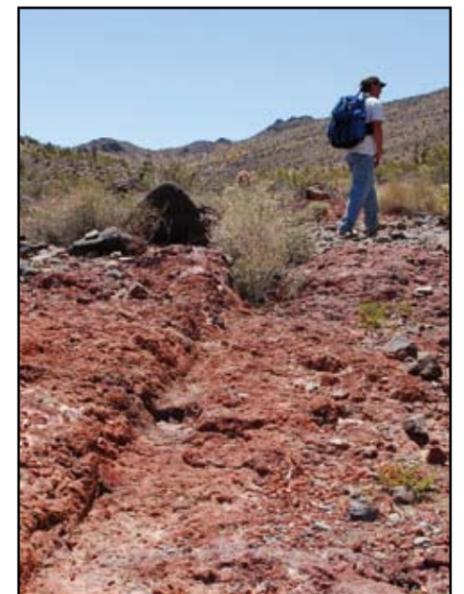
Caruthers Canyon is located in the rugged New York Mountains which rise above 7,500 feet. Chaparral plants grow here in a botanical "island" left over from wetter times.

Lanfair Valley – Located south of the New York Mountains along Ivanpah and Lanfair Roads. No signs or services. Respect the rights of private property owners.

This high valley shelters an impressive Joshua tree forest and was an early ranching and homesteading center. From 1893 until 1923, the Nevada Southern Railway ran up the valley from Goffs, providing services to homesteaders and ranchers in the valley and the miners in the mountains beyond. Little evidence remains of homesteads that once dotted the valley.

Piute Springs

6.1 miles west of U.S. 95 on the unmarked Mojave Road, then 3.1 miles west on an extremely rough unmarked dirt road. Trail; no signs or services. 4x4 vehicle recommended.



Wagon ruts from the historic Mojave Road are visible near Piute Springs.

A narrow ribbon of willows, cottonwoods, and rushes thrive along a half-mile section of Piute Creek. Fort Piute, one of a string of military outposts built along the Mojave Road, was located at this water source.

The recently stabilized ruins of Fort Piute are visible. Please respect these ruins. Don't climb on the foundations; don't remove rocks or anything else from the area.

Camping

Campgrounds

Two family campgrounds have vault toilets, trashcans, and potable water. There are no hookups, but there is a dump station at Hole-in-the-Wall. Each campsite has a picnic table and a fire ring. No reservations; \$12 per site per night, \$6 for Golden Age/Golden Access Passport holders. The group campground does accept reservations—see below.

HOLE-IN-THE-WALL CAMPGROUND

Located at 4,400 feet in elevation and surrounded by sculptured volcanic rock walls; there are 35 campsites for RVs and tents, and two walk-in tent sites.

MID HILLS CAMPGROUND

A fire swept through here in June, 2005, burning over much of the area. Unburned campsites are surrounded by pinyon pine and juniper trees. At 5,600 feet in elevation, Mid Hills is much cooler than the desert floor below. The access road is not paved and is not recommended for motorhomes or trailers; 26 campsites, about 1/3 in unburned areas.

BLACK CANYON EQUESTRIAN & GROUP CAMPGROUND

Located across the road from Hole-in-the-Wall Information Center, this campground has vault toilets, water, a picnic shelter with tables, fire ring, and corrals. Fee is \$25 per night; call 760-928-2572 for reservations.



above: Mojave yucca and cholla cactus grow near campsites at Hole-in-the-Wall. right: Wildfire in spring, 2005, burned pinyon and juniper at Mid Hills Campground.

Nearby Camping Areas

Providence Mountains State Recreation Area (Mitchell Caverns), 16 miles north of I-40 on Essex Road, has six campsites with tables and fire rings available on a first-come basis for \$12 per night.

Afton Canyon, 25 miles west of Baker on I-15, has a BLM campground with tables and fire rings for \$6 per night.

Commerical camping is available at Nip-ton and Needles, California.



Roadside Camping

Roadside car camping is permitted in areas that have been traditionally used for this purpose. Camping tramples vegetation; by picking sites that have already been used for camping, you help protect the desert from further damage. Not all sites can accommodate multiple vehicles; please don't enlarge sites. Do not camp along paved roads or in day-use areas, and stay at least 200 yards from all water sources.



Campfires are allowed in existing fire rings only; or bring a fire pan and pack out your ashes.

Selected Roadside Camping Areas

Near Kelbaker Road:

Rainy Day Mine Site

15.2 miles south of Baker on Kelbaker Road, then 0.3 miles northeast on the road to the Rainy Day Mine. 4x4 vehicle recommended; no RVs.

Granite Pass

6.1 miles north of I-40 on Kelbaker Road, just north of Granite Pass, then west on one of several access roads. Campsites are located just north of the granite spires. High clearance vehicle recommended; no RVs.

Kelso Dunes Mine

4 miles west of Kelbaker Road on Kelso Dunes Road, an unpaved road. Many campsites are available 1 mile beyond the marked trailhead near a clump of trees. Roadside camping is not allowed at the Kelso Dunes parking area or anywhere else along the Kelso Dunes Road, except at this site.

Near Cima Road:

Sunrise Rock

12 miles south of I-15 on the east side of Cima Road. Trailhead for Teutonia Peak Trail is nearby on the opposite side of Cima Road.

Near Black Canyon Road:

Black Canyon Road

5.2 miles south of Hole-in-the-Wall Information Center on the east side of Black Canyon Road, near rock piles.

Near Ivanpah and Cedar Canyon Roads:

Caruthers Canyon

5.5 miles west of Ivanpah Road on New York Mountains Road, then 1.5 to 2.7 miles north to campsites. 4x4 vehicle recommended; no RVs.

Guidelines for Explorers

Private Property

Private property inholdings are found throughout the Preserve. Please respect the rights of our neighbors. It is your responsibility to receive permission before hunting, hiking, or entering private property.

Cattle and Fences

Most grazing within Mojave National Preserve occurs on public land. This land is open to you to explore, but please don't disturb cattle, fences, or water tanks. Leave gates as you find them.

Pets

Pets must be confined to a leash no longer than six feet at all times, with the exception of dogs used while hunting. Dogs used for hunting must be under the owner's control at all times. Do not leave pets unattended inside or outside of vehicles.

Bicycles

Bicycles are allowed on dirt and paved roads, but are not allowed on hiking trails unless they are former roads. Bicycles are not allowed in Wilderness areas or for cross-country travel.

Collecting and Vandalism

Disturbing, defacing, or collecting plants, animals, rocks, historic or archaeological objects is prohibited. These are part of our national heritage, and should be left as you found them for all to enjoy. Metal detectors are not allowed.

Firewood & Campfires

Wood is scarce in the desert. Cutting or collecting any wood, including downed wood, is prohibited. All firewood, including kindling, must be brought in.

Campfires are allowed in fire rings in campgrounds and other established sites. To minimize your impact even more, use a firepan and pack out the ashes. Please do not leave fires smoldering or unattended.

Firearms

Target-shooting or "plinking" is not allowed within Mojave National Preserve.

Possession or use of firearms is prohibited, except during lawful hunting activities. A valid hunting license and appropriate tags are required. Do not shoot within 150 yards of any development (campgrounds, visitor centers, residences, etc.). Please remove all spent shells.

Firearms must be unloaded and cased within campgrounds and vehicles at all times.

Possession and use of fireworks or model rockets is not allowed.

Safety

Let someone know your trip route, destination, and return date, vehicle make and license plate. Cell phone coverage is sporadic.

Take a minimum of one gallon of water per person per day (two gallons if you are hiking), and drink it freely. Carry extra drinking water for emergencies.

Carry plenty of food, sunscreen, proper clothing, and a first aid kit with you at all times. Hikers should wear a hat and sturdy shoes and carry a good map, sunscreen, plenty of water, extra clothing and a flashlight for after sunset.

Familiarize yourself with the area and learn about desert travel and survival before you begin your exploration. Carry a good map and know how to use it.

Wilderness

Nearly 50% of Preserve lands have been designated by Congress as Wilderness. These special places offer the chance to escape the sights and sounds of civilization. Exploration on foot or horseback is encouraged; cars and other mechanized vehicles are not allowed. Please watch for and respect Wilderness boundary signs.

Backcountry Camping Guidelines

Including Roadside Camping, Backpacking and Horse Camping

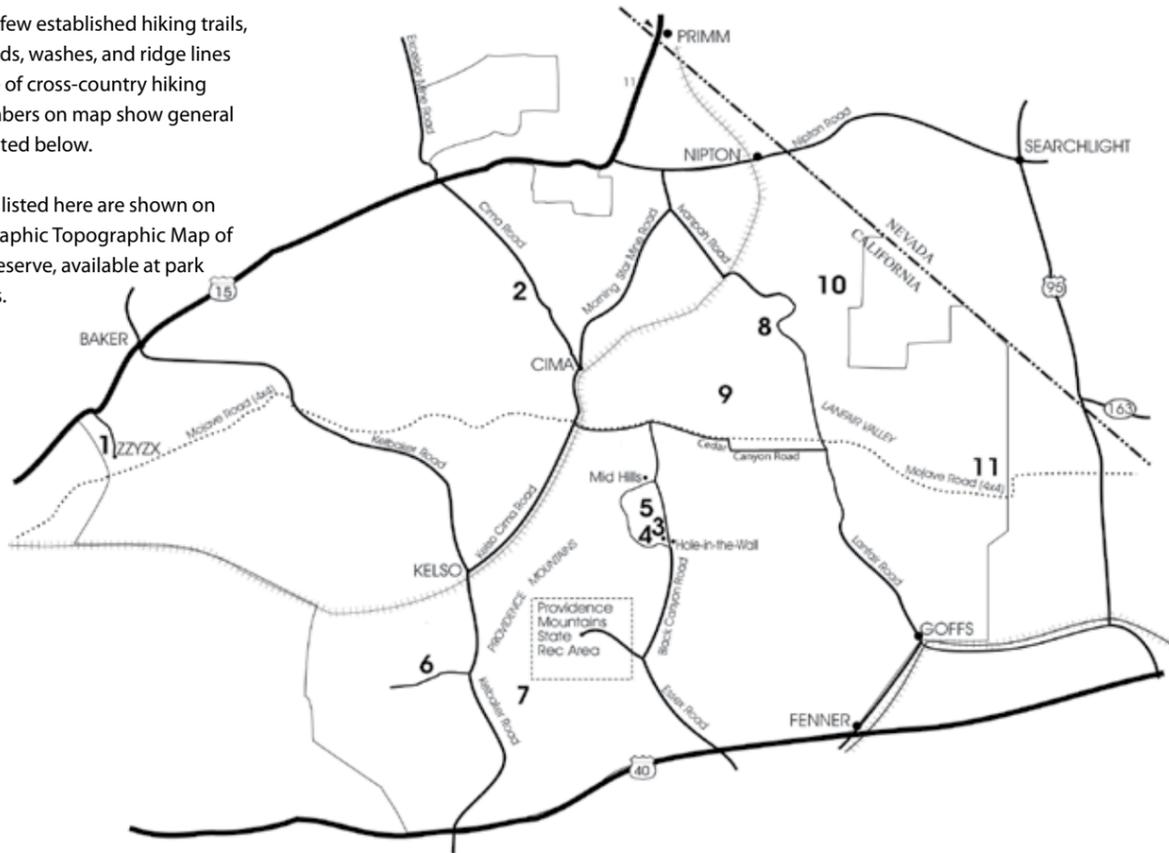


- There is no registration system, so be sure to let someone know where you are going and when you plan to return.
- Backcountry camping is limited to a 14 day stay.
- There are few trails; take a good map and become familiar with the area you are hiking through.
- In the summer, do not set up in a dry wash as flash floods can develop quickly in the desert.
- Carry plastic bags and pack out all of your trash.
- Bury human waste in "cat" holes six inches deep. Don't bury your toilet paper; put it in a plastic bag and pack it out.

Hiking

Although there are few established hiking trails, abandoned dirt roads, washes, and ridge lines offer an abundance of cross-country hiking opportunities. Numbers on map show general locations of trails listed below.

All trails and routes listed here are shown on the National Geographic Topographic Map of Mojave National Preserve, available at park information centers.



Developed Trails

1) Lake Tuendae Nature Trail – 0.25 miles round trip. Trailhead at Zzyzx parking area, 4 miles south of I-15 on Zzyzx Road.

Stroll around Lake Tuendae and learn about its importance to the natural and cultural history of the area.

2) Teutonia Peak Trail – 4 miles round trip. Trailhead 12 miles south of I-15 or 6 miles north of Cima on Cima Road.

Explore the dense Joshua tree forest on the way to a rocky outcropping on Cima Dome.

3) Hole-in-the-Wall Nature Trail – 0.5 mile round trip. Trailheads at Hole-in-the-Wall Information Center and Campground.

Learn to identify desert plants as you walk between the campground and information center.

4) Rings Trail – 0.5 mile round trip. Trailhead at picnic area 0.2 mile northwest of Hole-in-the-Wall Information Center. Trail connects to the Mid-Hills to Hole-in-the-Wall Trail.



Descend through Banshee Canyon with the help of metal rings mounted in the rock, and discover the holes of Hole-in-the-Wall.

5) Mid Hills to Hole-in-the-Wall Trail – 8 miles one way. Trailheads at entrance to Mid Hills Campground and about 1 mile west of Black Canyon Road on the south end of Wild Horse Canyon Road.

Hike through a maze of washes decorated with barrel and cholla cacti, then through the Hackberry Fire burned area. Watch carefully for trail route markers. Total elevation gain is 1,200 feet.

Recommended Routes

Warning: these routes are not established trails. Check a detailed map or consult a park ranger for route information. Maps and guidebooks are available at park information centers.

6) Kelso Dunes – Hike is 3 miles roundtrip. Trailhead is 3 miles west of Kelbaker Road on the well graded but unpaved Kelso Dunes Road. Road is rough with “washboard” in places.

Early morning and late afternoon climbers will appreciate both the rose-colored glow of the dunes and cooler temperatures. The hike may take several hours as you slog through the sand, then slide down the slopes.

7) Quail Basin – Hike is 6.5 round trip. No marked trailhead. Begin hike 12.5 miles north of I-40 on Kelbaker Road, then 1 mile east of Kelbaker Road on an unmarked dirt road. Park at junction with closed dirt road heading south.

Follow the closed dirt road to the south to a road that loops around a small valley. After walking the loop, return on via the same route. 4X4 vehicle recommended.

The route leads past jumble rocks into a small valley of Mojave Yucca and juniper surrounded by granite outcroppings.

8) Keystone Canyon – Hike is 3 miles one way. No marked trailhead. Route begins 18 miles south of Nipton Road on Ivanpah Road, then travel 2.5 miles west on an unmarked dirt road, bearing right at two forks. Bear left at 2.5 miles, then travel a short distance downhill to a parking area. 4X4 vehicle recommended.

Hike the deteriorating closed road into Keystone Canyon up to near the top of the New York Mountains. Continue cross-country to the top of the ridge for views to the west.

9) Caruthers Canyon – Hike is 3 miles one way. No marked trailhead. Route begins at primitive campsites in Caruthers Canyon, 5.5 miles west of Ivanpah Road on New York Mountains Road, then 2.7 miles north on unsigned road. 4x4 vehicle recommended.

Hike through a rocky basin to an abandoned gold mining area. Do not enter mine shafts or climb on abandoned structures; they are unstable and extremely dangerous.

10) Castle Peaks Corridor - Hike is 4 miles one way. No marked trailhead. Isolated area; requires 15 miles of rough dirt road driving. Hike begins 4.9 miles east of Ivanpah Road on signed Hart Mine Road; left at fork, then 0.9 miles, left at fork, then 3.4 miles, crossing an earthen berm; left at fork, then 1 mile more to where road ends. 4x4 vehicle recommended.

Walk up the closed road to the ridgetop and beyond into a small canyon. Excellent views of Castle Peak spires. The hiking route is not marked.

11) Piute Creek – Hike is 6.5 miles round trip. No marked trailhead. Hike begins on a hill 9.5 miles east of the junction of Lanfair Valley and Cedar Canyon Roads on a dirt utility road, then 0.5 miles north. 4x4 vehicle recommended.

Hike 6.5 miles roundtrip through colorful Piute Gorge and explore the ruins of Fort Piute, one of several military redoubts built and manned in the 1860s to protect mail and travelers on the Mojave Road. Return to your vehicle by following a now-unused trace of the Mojave Road. A perennial stream near Fort Piute, rare in the Mojave, supports riparian plants and animals. You will see stream-side plants recovering after a fire swept through in August, 2004.

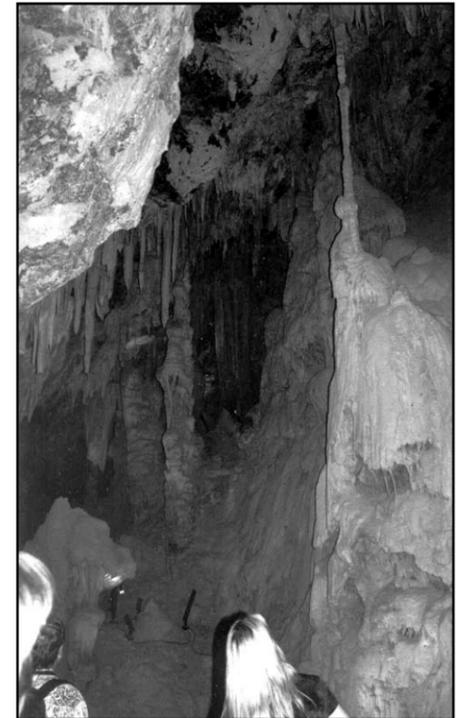
Providence Mountains State Recreation Area Trails

All trails begin near Mitchell Caverns headquarters, 6 miles west of Black Canyon Road on Essex Road.

Nina Mora Trail – 0.5 miles round trip. Path begins at east end of campground, travels over a ridge dotted with cactus and yucca, and past the grave of Nina Mora, a Mexican silver miner's daughter who died near here, and on to a viewpoint.

Crystal Spring Trail – 2 miles round trip. Steep trail passes through Crystal Canyon, a limestone and rhyolite rock gorge with castle-like formations. Cross slopes of pinyon and juniper mixed with barrel and prickly pear cactus, with excellent views of Providence Mountain Peaks nearby and the Clipper Valley below.

Mary Beal Nature Study Trail – 0.5 mile round trip. Booklet keyed to trail offers an introduction to high desert flora. The trail honors Mary Beal, an early desert botanist.



State park rangers conduct regularly scheduled tours of Mitchell Caverns.

Mitchell Caverns: A State Park within Mojave National Preserve

STALACTITES, STALAGMITES, HELICTITES, shields, and draperies are but a few of the formations inside Mitchell Caverns at Providence Mountains State Recreation Area. Located south of Hole-in-the-Wall in Mojave National Preserve, this 5,900 acre California State Park offers cave tours, camping, and hiking in the spectacular Providence Mountains.

TOURS

Guided tours of Mitchell Caverns require a 1½ mile walk and last about 1½ hours. Tour size is limited to 25 people. From Labor Day Weekend through Memorial Day, weekday tours start at 1:30 p.m.; weekend and holiday tours start at 10:00 a.m., 1:30 p.m., and 3:00 p.m. Summer tours, from Memorial Day through Labor Day, are offered at 1:30 p.m. daily. The cost is \$4 for adults, and \$2 for children ages 16 to six. No charge for children five and under. Reservations can be made by calling at least three weeks in advance. Groups of ten or more are by reservation only. Reservations are optional for groups smaller than ten. The temperature inside the cave is a comfortable 65°F, so dress for the outside weather. Wear sturdy shoes.

CAMPING AND HIKING

At 4,300 feet in elevation, the campground offers superb views of the surrounding desert. Six campsites with tables and fire rings are available on a first come, first served basis for \$12 per night. Water and flush toilets are provided. The Mary Beale Nature Trail, near the Visitor Center, features desert plants and animals along a moderate walk; a trail guide is available. There are two other short trails. Cross-country hikers can reach the peaks of the Providence Mountains. Groups planning to hike cross-country require a free permit from the Visitor Center.

For reservations and additional information, call 760-928-2586.

