



Mojave National Preserve

Issue 17 / Spring 2010



Wildflower season at Mojave National Preserve is truly a feast for the senses.

Predicting Mojave's Spring Bloom

As with the lore that goes with forecasting the weather, just about everyone has their own formula for predicting desert blooms. While certain basic rules apply (i.e. there must be precipitation), annual wildflower blooms are, in fact, extremely difficult to predict.

Many, such as ecologist Janice Beatley (1974), have stressed the importance of November and December precipitation to germination of spring-flowering annuals in the Mojave Desert. While fall and early winter rains can be important triggers to germination, they are not necessarily a prerequisite to outstanding spring blooms. Even heavy spring rains can promote later germination of winter annuals, as

furthermore, even during the best years, certain areas rarely have mass displays; soil type and vegetation cover are important factors. Prior to the Hackberry Fire in 2005, the Mid Hills were covered in places by dense stands of sagebrush. Today the areas opened up by the burn have enabled spectacular annual blooms.

Of the 920 known plant species in the Mojave National Preserve (MNP), approximately 35% are annuals. Some are summer annuals, which flower only in late summer or early fall after summer thunderstorms. The majority, however, are winter annuals that can be observed throughout the preserve this spring. Perennials run about two to four weeks behind the peak blooms of annuals. Thus, at any given location in the MNP, one might observe a peak bloom of showy annuals in March, but wish to return three weeks later to see the sage, mallow, penstemon, larkspur, and brittlebush!

The following are excellent wildflower-viewing locations in the preserve, with estimated peak-flowering periods. Examples of some of the more showy species are listed.

Cima Cinder Cones (mid to late March) Annuals: purple mat, Wallace daisy, Bigelow mimulus, brown-eyed primrose, desert dandelion, fiddleneck, lilac sunbonnet, little gold poppy, desert sunflower; Perennials/Shrubs: Anderson lycium, ratany, bladderpod, desert mallow, desert trumpet, Mojave aster, hedgehog cactus, and desert willow.

Kelso Dunes (late March to early April) Annuals: Borrego locoweed, dune primrose, sand verbena, wooly marigold, silk dalea, spectaclepod; Perennials/Shrubs: dune lily, big galleta grass, indian rice grass, sandpaper plant, and dune panic grass.

Von Trigger Hills and Piute Range (late March to early April) Annuals: Canterbury bells, notch-leaved phacelia, stellate gilia, sand blazing star; Perennials/Shrubs: beavertail cactus, Mojave mound cactus, Mariposa lily, and desert senna.

Hole-in-the-Wall (late March to early April) Annuals: desert tobacco, forget-me-not, Fremont pincushion, white-stemmed stick-leaf; Perennials/Shrubs: Mojave horsebrush, desert alyssum, windmills, and prince's plume.

Cima Dome and Mid Hills Campground (mid to late April) Annuals: desert marigold, yellow throats, white tidy tips, groundsel, chia, locoweed, rattlesnake weed; Perennials/Shrubs: turpentine broom, palmer penstemon, Mojave yucca, Joshua tree, linear-leaved goldenbush, indian paintbrush, and Mojave sage.

High peaks (early May) Annuals: hoary aster, groundsel, California chicory, Pringle eriophyllum, golden gilia; Perennials/Shrubs: Apache plume, serviceberry, heliotrope, long-leaf phlox, piñon aster, yellow cut-leaf, banana yucca, and giant four-o'clock.

Jim Andre & Tasha La Doux
Sweeney Granite Mountains Desert Research Center

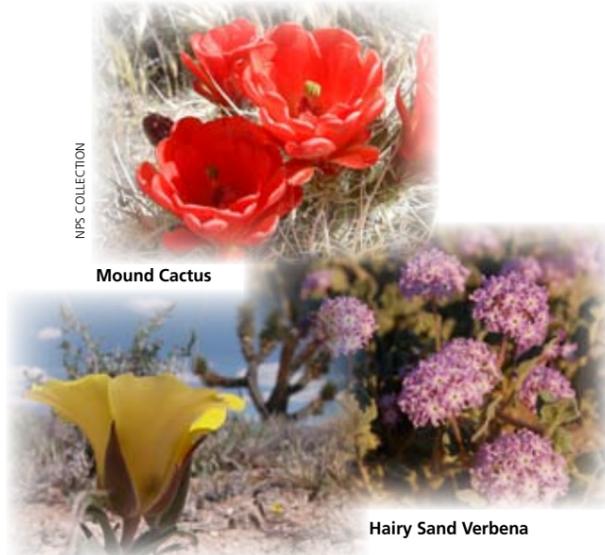
Welcome to Mojave!

With mild temperatures and longer days, spring is a great time to visit the Mojave. Desert-dwellers monitor winter rains carefully, hoping that enough falls at the right time to produce a good spring bloom. Rains were sparse early in the winter, but several storms in January brought significant rainfall, so there could be some great wildflower-watching this spring. The season generally begins in late February at the lower elevations, with flowering continuing up to higher elevations through May.

As you are about to discover, the preserve encompasses a vast area of the Mojave Desert ecosystem and offers landscapes unlike any you might see elsewhere, including sand dunes, Joshua tree forests, cactus gardens, lava beds, and cinder cones. Here you will find opportunities for quiet canyon hikes, backcountry road trips, and visits to old mines and military outposts. Stay at one of the campgrounds or pick from hundreds of backcountry campsites, and you will experience the dark night sky and see an amazing number of stars. Most of us don't get to see this anymore, so enjoy it while you're here.

Many adventures await you at Mojave National Preserve. I encourage you to enhance your experience by taking short walks in various habitats. Suggested hikes are listed on page 7. For trip-planning advice or to learn more about park resources and management activities, rangers are on duty at all information centers. You can also visit us online or contact park staff by phone as indicated on the second page of this guide.

Dennis Schramm
Superintendent



NPS COLLECTION

Mound Cactus

Hairy Sand Verbena

Mariposa Lily

occurred in 1965 and again in 1991. Both years saw spectacular spring blooms following very dry fall and winter seasons. In addition to the timing of precipitation, there are many other environmental factors such as temperature, herbivory, and the status of the seed bank, which can strongly impact annual plant establishment and development.

Heading into the winter of 2009-2010, the Mojave Desert was exceedingly dry. And while a moderate El Nino had developed by late 2009, it was not until January 17-22, 2010, that a characteristic El Nino weather pattern finally emerged. The result was two to five inches of precipitation throughout the preserve. This signature event transformed the 2010 spring bloom prediction from one of dismal to very promising. Another one to two inches of widespread precipitation fell during two storms in early February. If all goes well in the next month, we should see the finest spring bloom since 2005.

However, even at this late date a number of potential scenarios could preclude an excellent spring bloom: several weeks of warm, windy weather might trigger premature flowering, leading to an early and brief bloom that diminishes by late April; a late-season cold snap might kill or retard growth of seedlings, especially at the higher elevations, and herbivores (those whose diet is plants) such as rodents, rabbits, quail, and insects can really foil a good show.

2-Wildlife Viewing

Mojave National Preserve is home to hundreds of species of amphibians, reptiles, mammals, birds, and even fish. For many traveling through this vast, harsh, desert landscape, the question becomes, "where are they"? Wildlife biologist Neal Darby gives insights into where you might see some of these elusive creatures.

5-Speeding Kills

Long stretches of straight, paved blacktop and wide, graded dirt roads can be ideal scenic alternatives to I-40 and I-15. But, when traveled at high speeds, they can also spell disaster for people and wildlife. Ranger Kirk Gebicke speaks of the all-too-familiar story...

6-Campgrounds

Mojave National Preserve is a camper's paradise. Developed campgrounds, roadside camping, and backcountry camping offer opportunities for individuals and groups of diverse ages, interests, and skills. Careful planning and knowledge of camping rules and regulations will help ensure an enjoyable and safe experience for you, future visitors, and the fragile desert environment...

Essential Information...2, 3

The Mojave Road...3

Desert Bighorn...4

Ranger Programs...5

Hiking...7

Mojave National Preserve Map...8





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' near Baker to 7,929' at Clark Mountain. Although most of the park lies in the Mojave Desert, the southeast section grades into the 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

Deputy Superintendent
Larry Whalon

Chief Ranger
David Ashe

Chief, Resource Interpretation
Linda Slater

Newspaper Editor
Jennifer Morrell

Mailing Address
2701 Barstow Road
Barstow, CA 92311

Web and E-mail
www.nps.gov/moja
For e-mail, click "Contact Us"

Park Headquarters
ph: 760-252-6100
fax: 760-252-6174

The National Park Service cares for the special places saved by the American people so that all may experience our heritage.

Where Can I See the Wildlife?

THE MOJAVE DESERT HAS AN INCREDIBLY DIVERSE assemblage of wildlife. 38 species of amphibians and reptiles, 50 species of mammals, and over 300 species of birds call Mojave National Preserve home. In addition, despite the scarcity of water, a fish does just fine here.

So why don't we see all these wildlife species when traveling through the desert? Animals have adapted in order to survive in the harsh desert. Because it's extremely hot and dry six months out of the year, wildlife need to conserve water. They do that by being more active at night or inactive during the hottest and driest times of the year. This means they are less likely to be seen by the casual passerby. This article is intended to introduce some of their adaptations and to increase the likelihood that you will see some of Mojave National Preserve's wildlife.

We hope you'll have the opportunity to experience and appreciate the wildness of this place, but because wildlife in the preserve can be unpredictable and dangerous please take note of the following guidelines:

- Maintain an appropriate distance of 50 to 100 yards.
- Avoid surprising wildlife, and do not surround them.
- Do not feed or attempt to feed wildlife.
- Do not harass or harm wildlife.
- Stay clear of nests, dens, and baby wildlife.
- If you believe a baby or adult animal is abandoned or injured, call for a ranger's assistance. Do not handle them.
- Please drive slowly, and follow posted speed limits.
- Park your vehicle safely off the road before viewing wildlife.
- Respect the rights of private landowners.

If you can agree to these conditions, read on to learn how to increase your chances of seeing some keystone species. To many people, desert bighorn sheep are the king of the Mojave Desert. These regal animals are adapted to open areas of low to sparse vegetation on mountainous terrain. Unlike most other desert wildlife, bighorn sheep are

well adapted to the desert heat and are most active during the day. In winter, bighorn are widely scattered and it takes a trained and experienced eye to spot them on steep mountain slopes near rocky crags. Keep an eye out in the Woods Mountains and Wildhorse Mesa

near Hole-in-the-Wall. Also check out Jackass Canyon in the Kelso Mountains. In summer, bighorn visit water holes more frequently, increasing your chances of seeing them. Drive the road to Zzyzx, but be careful, as the bighorn can often be found right on the road! If you're willing to walk in the heat, Piute Creek and Hackberry Springs are other good viewing areas.

Mule Deer have adapted to the desert by being most active at dawn and dusk as well as at night, and they tend to stick to areas with heavier vegetation cover. Slowly drive the Cedar Canyon Road from the Black Canyon Road junction east towards Rock Springs at dawn or dusk. Or better yet, spend a night or two in the Mid Hills Campground and watch the sunrise and sunset. Along with this comes the potential to see mule deer near your camp.



Top to Bottom: Bighorn Sheep and Mule Deer.

Of course we cannot forget the desert tortoise, which defines the Mojave Desert. Tortoises have adapted to the desert by being active for only brief periods throughout the year. Spring and after-summer rains are favorite times for tortoises. They avoid the heat and dryness of summer and the cold of winter by escaping into deep burrows. When temperatures and precipitation are just right they come out en masse. At these times, they can often be seen crossing roads or standing on road shoulders in flat, lower-elevation areas dominated by creosote bush. Please be careful and slow down so you do not hit them with your vehicle. April and May are the best times to see them, especially along the Ivanpah, lower Morning Star Mine, and Essex roads.

This covers just a speck of potential wildlife-viewing opportunities in the preserve. Ask a park ranger for further guidance.

Neal Darby, Wildlife Biologist

Essential Information

Dates and Hours of Operation

The preserve is always open. Information centers (see below) maintain regular hours of operation.

Fees and Reservations

There are no entrance fees. See page 6 for information about campground reservations and fees.

Information Centers

Three information centers provide orientation, information, and trip-planning advice. Park rangers are on duty. Western National Parks Association (WNPA) bookstores offer books, maps, and more.

Kelso Depot Visitor Center

Located 34 miles south of Baker, Calif., on Kelbaker Road. Open daily, 9 a.m.–5 p.m.

Hole-in-the-Wall Information Center

Located 20 miles north of I-40 on Essex and Black Canyon roads. Winter hours (October–April): Open daily, 9 a.m.–4 p.m. Summer hours (May–September): Friday through Sunday, 9 a.m.–4 p.m.

Headquarters Information Center

Located at 2701 Barstow Road, Barstow, Calif. Open Monday through Friday, 8 a.m.–4:30 p.m.

Food: The Beanery @ Kelso

The lunch room concession offers hot & cold beverages, soups, salads, sandwiches, snacks and desserts. Located at Kelso Depot Visitor Center. Open Friday through Tuesday, 9 a.m.–5 p.m.

Water

Drinking water is available only at Kelso Depot Visitor Center, Hole-in-the-Wall (HITW) Information Center, and the following campgrounds: HITW, Black Canyon, Mid-Hills and Providence Mountains State Recreation Area.

Gasoline

There are no gasoline stations within Mojave National Preserve. Gasoline can be purchased along I-40 at Needles, Fenner, and Ludlow, CA, along I-15 at Baker, the Cima Road exit, and Primm, NV, and along U.S. 95 at Searchlight, and the 163 junction at Palm Gardens, NV.

Lodging

There are no motels within Mojave National Preserve. Lodging is available in Barstow, Nipton, Ludlow, Needles, Baker, and Twentynine Palms, CA, and in Primm and Searchlight, NV.

Bicycles

Bicycles are allowed in parking areas, on paved roads, and on existing open dirt roads. Bicycles are not allowed in Wilderness Areas, on hiking trails, or for cross-country travel.

Mojave Temperatures: Average High / Low

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

Pets

Pets are welcome in Mojave National Preserve, though they are not allowed inside information centers. They must be leashed and never left unattended. Dogs used during hunting activities must be under the owner's control at all times. Please collect and dispose of pet waste in garbage receptacles.

Collecting and Vandalism

Disturbing, defacing, or collecting plants, animals, rocks, historic or archeological objects is prohibited. Leave these resources as you find them for everyone to enjoy. Metal detectors are not allowed.

Exploring Mojave

Scenic Cima Road connects I-15 with Cima, CA, traversing the world's largest concentration of Joshua trees.

Avenues to Adventure

Mojave National Preserve is vast. At 1.6 million acres, it is the third-largest unit of the National Park System in the contiguous United States. Some of Mojave's wild and historic splendor can be seen from the primary roads of the preserve, while even more awaits those who travel its trails and unmaintained roads.

Long before the coming of white men, an ancient trade trail spanned the Eastern Mojave Desert. It connected the villages of the powerful Mojave Indians on the Colorado River (in the vicinity of Needles) with the California Coast. This ancient trail is now known as the Mojave Road. This unpaved corridor runs 133 miles through the heart of the Preserve. Exploring any portion of it will give you insight and appreciation into the cultural and natural history that makes this desert unique.

Dennis Casebier, local historian and founder of the Mojave Desert Heritage & Cultural Association (MDHCA), leads travelers on this historic trail in his book, *Mojave Road Guide, An Adventure Through Time*. Below are excerpts from this text that will take you past one of the most vital water sources on the Mojave route, the earliest wagon road, magnificent views of the Providence Mountains, and dramatic lava flows and cinder cones as you follow the ancient trail from the Kelso Cima Road to Kelbaker Road.



Historical marker at Kelso Cima Road junction.

Start at the junction of the Kelso Cima Road and the Mojave Road, 14 miles north of the Kelso Depot Visitor Center. This will be mile 62.1. Head west past the stone historical marker. The country ahead is primitive and isolated. There are no good roads until you reach the pavement of Kelbaker Road 23 miles away. **This route is recommended for 4WD high-clearance vehicles only. Drive with caution and be prepared for off-pavement conditions.**

Mile 62.6 - Cross large Kelso Wash - continue ahead directly west.

There are beautiful spots along here for a break. Magnificent views of the Providence Mountains, Kelso Valley, the Union Pacific Railway track with perhaps a train laboring along it, the Kelso Dunes, and much more.

Mile 66.7 - Intersect with improved road directly ahead and to the left. Continue on the road directly ahead.

Road to the left goes to an area of mining and prospecting in the Beale Mountains.

Mile 67.3 - Road bends southwest around the point of the mountains to the left leaving the less-well traveled road that continues northwest.

Watch mileage and look for cairns to avoid missing this turn. The road to the northwest goes to Rainbow Wells.

Mile 68.2 - Cross a large wash. The road strikes out across an open area toward Marl Springs.

The Marl Mountains lie less than two miles, directly ahead. Continue toward Marl Springs.

Mile 69.4 - Continue ahead across north-south pole line road.

To the south, on the pole line, it is 10.5 miles to Kelso Cima Road.

Information Continued...

Permits

Permits are required for all organized events, group events (more than 15 individuals or seven vehicles), and commercial activities such as filming. Fees apply. Proof of insurance and posting of a bond may also be required, call 760-252-6107 or visit www.nps.gov/moja for more information.

Hunting

Hunting is permitted in accordance with state regulations. All hunting activities require a license; requirements for additional permits and tags might apply. Visit the California Department of Fish & Game website at <http://www.dfg.ca.gov/> for more information.

Target shooting or "plinking" is prohibited. No shooting is permitted within a ½-mile of developed areas, including campgrounds, information centers, Kelso Dunes, Fort Piute, Sweeney Granite Mountains Desert Research Center, and the Desert Studies Center at Zzyzx.

New Firearms Law

As of February 22, 2010, people who can legally possess firearms under federal, state of California, and local laws, are allowed to possess firearms in Mojave National Preserve. It is the visitor's responsibility to understand and comply with all applicable state, local, and federal firearms laws.

Dirt Road Driving

Prepare Your Vehicle

Ensure that your vehicle is in good condition: check tires, oil, and gas gauge.

For emergencies, carry tools, tire jack, towrope, extra water, and fluids for your vehicle.

Know the Rules of the Road

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

Off-pavement travel is allowed only on existing open dirt roads. Do not travel cross-country or create new routes. This rule is strictly enforced; violators will receive citations. Driving in washes is not permitted. Watch for and respect Wilderness Boundary signs; motorized vehicles and bicycles are not allowed in designated Wilderness Areas.

Check Road Conditions

Road conditions vary widely. Dirt roads might be rough, sandy, or muddy, rendering them impassable, and the unprepared motorist could be trapped many miles from help. Watch for cattle, burros, and other 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.

Mile 70.4 - Arrive at Marl Springs.

There are two springs here, an upper spring and a lower spring. The Army fort and later way station were by the upper spring. The remaining arrastra is at the lower spring.

Mile 70.4 - Leaving Marl Springs, turn north and follow the road marked with cairns just above the upper spring, staying close to the edge of the Marl Mts.

The very earliest wagon road went south out of Marl Springs.

Mile 71.0 - There is a Y, take the road to the left. Pass under the Power Lines.

Passing over the crest of Cimacito, one will get exceptional views.

Mile 73.8 - Mojave Road Mail Box - sign in and continue ahead.

In 1983 Friends of the Mojave Road erected a metal mail box for passersby to record their names and impressions of the Mojave Road Recreational Trail.

Mile 74.0 - 2 range fences with cattle guards - pass through and continue ahead.

Mile 76.8 - Road gets sandy and progressively more sandy in the next two miles.

Mile 78.8 - Mojave Road crosses the Aiken Cinder Mine Road - cross it and continue toward Willow Wash.

To the right there are water tanks, troughs, and a small corral.

Mile 81.5 - Fairly good road crosses - continue ahead down Willow Wash - extremely soft and loose sand ahead.

Mile 83.6 - Cross another road that goes into the cinder cone and lava flow area.

Mile 85.2 - The Mojave Road intersects Kelbaker Road, 15 miles south of Baker.

Federal law prohibits firearms in certain facilities in this park; those places are posted with signs at public entrances. If you have any questions, please contact Chief Ranger David Ashe at 760-252-6130.

Private Property

Private inholdings are found throughout the preserve. Please respect the rights of our neighbors. It is your responsibility to obtain permission before entering private property, including to hunt or hike.

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.

Firewood and 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 and other established sites. To minimize your impact, use a firepan and pack out the ashes. Please do not leave fires smoldering or unattended.



NPS/SHAWN THOMAS

Bighorn Sheep (*Ovis canadensis*) abound in the mountain ranges of Mojave National Preserve.

Desert Light Gallery

Since the turn of the last century, transcontinental railroads have promoted rail travel to national parks by producing framed prints and advertising art that depicts the beauty of these national treasures. The tradition of close ties between the railroads, art, and national parks continues with *Mojave: Near & Far*, a photography exhibition at the Desert Light Gallery in Kelso Depot Visitor Center.

Mojave National Preserve invites desert travelers to experience the photography of Jim Smart. Smart's exhibit, *Mojave: Near & Far*, will be on display from January 23 to April 25, 2010.

Jim Smart has been taking photographic images for 50 years and had intended to let the digital generation pass him by; but as an instructor in photo-journalism at CSU-San Bernardino, Smart found that he could no longer avoid converting if he were to serve the students. So he set aside his treasured Leica and Hasselblad cameras and joined the digital age. Although he continues to shoot with film, many of the images in this exhibition were taken with a Canon 5D Mark II.



© JIM SMART

In *Mojave: Near & Far*, Smart explores the stunning scenery of the desert both at the landscape level and in detail, finding interest in uncommon perspectives and unique moments created by the desert's celebrated light.

Living on the Edge

Desert Bighorn at the Precipice of Climate Change

THE DESERT BIGHORN (*OVIS CANDENSIS NELSONI*) look as lithe and graceful as ballerinas, making death-defying ascents of Old Dad Mountain in Mojave National Preserve. Water is scarce and summer temperatures are high. These animals are survivors with a history that chronicles millions of years.

The bighorn comes from the land of ice. During the Pleistocene, about two million years ago, the climate warmed and glaciers melted. The resulting geologic processes formed a land bridge that connected northern Asia to North America. The sheep crossed this terra firma and dispersed from cold, arctic areas of Canada to warm, arid regions of the southwest desert. The species evolved into thin-horns that populated colder climates and bighorns that inhabited warmer areas.

They were well adapted to mountainous regions with cloven hooves for rocky ledges and keen eyesight to spot predators. Bighorn thrived for millions of years until unregulated hunting and habitat fragmentation, during the nineteenth and early twentieth centuries, decimated their populations. Bighorn rams were highly coveted for their horns that curl to lengths of 30 inches.

Ironically, the animal from the ice is now threatened by the climatic implications of its melting homeland. This unique species, adapted to extremes, faces an uncertain enemy: climate change. Wildlife biologist Neal Darby states that even the healthy bighorn near the Old Dad Mountain are at risk if their forage disappears and their water sources dissipate. According to climatologists, temperatures are forecast to increase 2-5 degrees Fahrenheit by 2050. A general drying trend is predicted for the southwest desert, with increasing evaporation, decreasing precipitation, and more variability in precipitation from year to year.

This places the approximately 240 desert bighorn at Old Dad Mountain on a slippery slope. As ruminants with four chambered stomachs, bighorns extract optimum nutrients from plants. Even a small increase in temperature and a decrease in precipitation can adversely affect plant growth and nutrition.

Desert bighorn, particularly ewes which reach sexual maturity at two, rely on plants for nutrition and energy for lactation. Ewes that

don't have enough food for proper lactation can't support their lambs. John D. Wehausen, an authority on the Desert Bighorns, observed in field studies that lambs had the best chance of survival with adequate forage. Lambs are most often born between January and April and are completely dependent on their mother for the first four to six months of life. Low quality forage and a lack of water can spell death.

The bighorn in Mojave rely on numerous ephemeral springs to survive, in addition to artificial water sources. These springs are the lifeblood for over 300 birds and 50 mammals. If temperatures increase and precipitation drops the springs may evaporate. During the summer, temperatures can exceed 100 degrees Fahrenheit. Lactating ewes need to drink almost every other day to survive during these searing temperatures. As seeps evaporate, desert bighorn may become concentrated near artificial water sources.

If their water and food becomes less available, the desert bighorn that grace Mojave must migrate north. Migrating through Mojave poses formidable challenges. Interstate 15 bisects the Preserve separating lower ranges south of the highway from the almost 8,000 foot Clark Mountain north of the interstate. In their attempt to move from one range to the next, bighorns risk getting hit by vehicles on one of the busiest travel corridors in Southern California. Darby states that all wildlife, not only desert bighorn, must have corridors with no impediments that block or compromise their ability to move.

If bighorns are too confined and don't have enough space they are more prone to disease and inbreeding. Darby observed the crash of such a population of bighorns exposed to domestic sheep when he worked at Great Basin National Park in Nevada.

Desert bighorn may not only need to move, but also develop adaptations to survive climatic changes. Will there be enough time? Climate change is moving at a breakneck pace. Ellen Meloy, in *Eating Stone*, bemoans the sudden disappearance of desert bighorn in New Mexico, "Year after year, the river cliffs held their absence, air empty of blood and breath. The sheep were gone." The desert bighorn is truly an animal living on the edge.

Hilary Clark, Park Ranger

CCC Installs Fencing at Vulcan Mine

Four miles south of Kelso, a potholed strip of pavement leads into the Providence Mountains. Follow that road for five miles into Foshay Pass, and you'll find a deep pit. The crumbling road and abandoned pit mine are reminders of a time when the entire country was focused on supporting the war effort. From 1942 until 1948, huge dump trucks rumbled down the road and into Kelso. At the time, this nine-mile section was the only paved road in the region. The trucks brought loads of iron ore from the Vulcan Mine to Kelso to be loaded onto freight cars for the 178-mile journey to the Kaiser Steel Mill in Fontana. The steel was used to build Liberty Ships, which carried war equipment and material to the European and Pacific Theaters of War.

Mining at Vulcan was suspended in 1948, leaving behind an open pit with a circumference of about 2,700 feet. The walls of the pit drop nearly vertically for 200 feet. Today, the aban-

doned mine pit is a popular place to visit, for its history, its scenic views and roadside camping nearby. But the steep-walled hole is a danger to visitors. Although the rim of the pit might appear to be stable, those who step too close may find themselves on a crumbling slope leading to a 200-foot drop.

Mojave National Preserve received funding under the American Recovery and Reinvestment Act of 2009 (ARRA) to construct a chain-link fence around the perimeter of the pit. The fence will eliminate access to dangerous slopes and pit walls. Parts of the fencing are brown or black in color to blend with the surrounding terrain. A break in the fence at the road entrance will provide access for those who wish to walk down to the bottom of the pit.

Labor for the project was provided by the California Conservation Corps. Modeled on the

Civilian Conservation Corps of the 1930s, the mission is as follows:

"The young women and men of the Corps work hard at protecting and restoring California's environment and responding to disasters, becoming stronger workers, citizens and individuals through their service." To accomplish the project, a 10- person crew from Los Angeles camped during the month of February in Foshay Pass near the Vulcan Mine. "The CCC crew did a great job on this fencing project," said Ted Weasma, project manager for the National Park Service. "The mine pit is a great place to make a connection with our history, and now it's a much safer place for families."

Linda Slater, Chief of Interpretation



NPS COLLECTION

Vulcan Mine in the 1940s



© TERESA ELLIS

Cedar Canyon is one of many graded dirt roads in the preserve that provide avenues to explore the vast terrain of the desert.

Protect Desert Tortoises

The threatened desert tortoise is a marvel of desert adaptation. Its continued survival, however, is largely dependent on responsible human behavior.

Admire from Afar

Do not harass or approach a tortoise too closely. When no water is available, tortoises reabsorb water from their bladders. If frightened, they might release their bladders and lose this vital water supply.

Mindful Motoring

Stay on established roads. Vehicles can crush burrows, killing tortoises and eggs.

Check beneath your vehicle before driving away. On hot days, tortoises enjoy the shade that cars provide.

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

Pet Smarts

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



NPS COLLECTION

High Speeds & Soft Sand Spell Disaster

HE SLOWLY AND CAUTIOUSLY APPROACHED, PEEKED OVER THE berm and looked both ways. He could see at least 100 yards in each direction. Walking ever so slowly to the edge of the road he again looked both ways. It was clear. He started across as fast as he could go, and after a short while he was about halfway; then it happened. He felt it coming and knew he was in trouble, but what could he do? At first he thought he could out run it, but then knew better.

"I'm a tortoise", he thought, and running fast is not one of my strong points. The only other option was to hide in his shell, so he pulled his limbs and head in and waited. It only took a few seconds, the noise and vibrations became more intense, the car flew by and this time he was fortunate. He made it to the other lane, slowly dusted himself off, and continued his trip across the road to the other side.



NPS/KIRK GEBICKE

Single vehicle accident on Morning Star Road. Moderate injuries.

Tortoises can live 60 to 80 years or more which is quite old, even for a human. He had seen what happened to many of the desert creatures when cars raced by. He had lost family members and other acquaintances over the years simply because they were too slow to get out of harm's way, though it's some of the faster members of the desert creatures that get hit the hardest as far as pure numbers go. He had even seen what can happen to the cars and the humans driving them when they travel too fast.

One day a car ran off the road, flipped, and came crashing through the desert near his burrow. That was a terrible day. The humans were crying, and one was dead. Others were seriously injured and it took a long time before help arrived.



NPS/KIRK GEBICKE

Single vehicle roll-over on Ivanpah Road. No injuries.

Why do the cars drive so fast he wondered? Don't the humans have the ability to control their speed? Don't they care if they hurt their loved ones or themselves? Don't they care if they run over the desert creatures on their way through?

Mojave Preserve averages one vehicle accident a week. These are typically injury accidents that are caused by no other reason than vehicles traveling too fast for drivers to react to situations. The maximum speed limit is 55 MPH in the Preserve. Please watch your speed, help avoid the desert creatures, keep yourself safe, and save your money. (Speed is costly on your gas costs and can be costly if you receive a citation)

Please don't let the desert creatures wonder about you. Watch your speed and be aware that tragedies happen regularly. YOU have the ability to change what has become a common outcome of cars traveling too fast for the road conditions. Cars hit a dip, or catch the soft sand shoulder and roll.

Kirk Gebicke, Law Enforcement Ranger

Park Ranger Programs



NPS COLLECTION

NPS COLLECTION

Kelso Depot Tours - Kelso Depot (year-round)
Monday-Friday @ 11:00 a.m. & 2:00 p.m.

Kelso Dunes Walk - Kelso Dunes Trailhead (October-April)
Saturdays @ 11:00 a.m.

Petroglyphs: Rocks that Talk - Hole-in-the-Wall (October-April)
Saturdays @ 3:00 p.m.

Someplace Special - Hole-in-the-Wall Amphitheater (October-April)
Saturdays @ 7:30 p.m.

Geology Talk - Hole-in-the-Wall Information Center (October-April)
Sundays @ 9:00 a.m.

Flora & Fauna Walk - Teutonia Peak Trailhead
Sundays - March 14, 28 & April 11, 25 @ 2:00 p.m.

Camping & Backcountry Travel

Backcountry Guidelines & Regulations

Backcountry travel and camping—backpacking, dispersed camping, and horsepacking—require careful planning in order to ensure a safe and rewarding experience. Visitors should adhere to National Park Service regulations and are further encouraged to follow Leave No Trace guidelines to minimize their impact on the fragile desert environment. Additional regulations apply for roadside camping (see below) and horsepacking (talk with a park ranger or visit us online for more information: www.nps.gov/moja).

Leave No Trace principles are rooted in scientific studies and common sense. The message is framed under seven Leave No Trace Principles presented below with accompanying regulations and guidelines specific to Mojave National Preserve:

1. Plan Ahead and Prepare

- There is no permit or registration system for backcountry camping at Mojave National Preserve; be sure to notify others of your travel itinerary.
- Few established trails exist; carry a good map and familiarize yourself with desert travel and survival skills before beginning your trip.

2. Travel and Camp on Durable Surfaces

- Reuse existing campsites (required for dispersed camping—see below).
- Do not make camp in a dry wash—flash floods develop quickly in the desert.
- Camping is limited to a maximum of 14 consecutive days per visit/stay and 30 total days per year.
- Campsites must be more than 200 yards from any water source.
- Camping is not permitted: within 1/4 mile of any paved road; within 1/2 mile of Fort Piute or Kelso Depot; within 1 mile north of the Kelso Dunes (i.e., the crest of the dunes) or 1/4 mile south of the Kelso Dunes access road. (Exceptions might apply for dispersed camping—see below.)

3. Dispose of Waste Properly

- Store all food and garbage in a manner that will prevent access by wildlife. Carry plastic bags and pack out all trash.
- Bury human waste in catholes 6-8 inches deep, at least 200 feet from water, camp, and trails. Pack out all toilet paper and hygiene products.
- Pet excrement must be collected and disposed of in garbage receptacles.

4. Leave What You Find

- Disturbing, defacing, or collecting plants, animals, rocks, and historic or archeological objects is prohibited. As part of our national heritage, these resources should be left as they are found for all to enjoy. Metal detectors are not allowed.

5. Minimize Campfire Impacts

- Campfires are allowed in established fire rings only, or with use of a portable firepan (be sure to pack out ashes). Do not leave fires smoldering or unattended.
- Cutting or collecting any wood, including downed wood, is prohibited. All firewood must be brought into the preserve.

6. Respect Wildlife

7. Be Considerate of Other Visitors

This copyrighted information has been reprinted with permission from the Leave No Trace Center for Outdoor Ethics. For more information or materials, please visit www.LNT.org or call 303-442-8222.



Friends and family enjoy the spectacular setting of Hole-in-the-Wall Campground.

Campgrounds

Hole-in-the-Wall Campground

Facilities: pit toilets, trash receptacles, potable water, fire rings, picnic tables, dump station; no utility hookups.

Fees: \$12 per site per night, \$6 for America the Beautiful Senior/Access Pass holders.

Reservations: not accepted; campsites available on a first-come, first-served basis.

At 4,400 feet in elevation, Hole-in-the-Wall Campground is surrounded by sculptured volcanic rock walls and makes a great base camp for hikers (see p.7) and for exploring nearby Mitchell Caverns in the Providence Mountains State Recreation Area. Thirty-five campsites accommodate RVs and tents; two walk-in sites are also available.

Mid Hills Campground

Facilities: pit toilets, trash receptacles, potable water, fire rings, picnic tables; no dump station or utility hookups.

Fees: \$12 per site per night, \$6 for America the Beautiful Senior/Access Pass holders.

Reservations: not accepted; campsites available on a first-come, first-served basis.

The Hackberry Fire swept through the Mid Hills area in June 2005, burning much of the vegetation; however, about half of the 26 campsites were left unharmed and remain 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 unpaved and is not recommended for motorhomes or trailers.

Black Canyon Equestrian & Group Campground

Facilities: corrals, pit toilets, trash receptacles, potable water, fire ring, grill, picnic shelter with tables.

Fees: \$25 per group per night.

Reservations: required; call 760-928-2572 or 760-252-6104

Located across the road from Hole-in-the-Wall Information Center. Horses and riders are welcome at Mojave National Preserve! Permits required for large groups (see p.2 for permit information).

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 \$25 per night. See page 7 for more information.

Afton Canyon

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

Commercial camping within the preserve:

Mojave Desert Outpost - Located at 49448 Ivanpah Road, 1/2 mile north of Cedar Canyon Road.

This privately owned campground offers basic dry camping to large or small groups by reservation only.

For more information or to make a reservation call: 951-780-3179 or check their website at mojavedesertoutpost.com

Commercial camping outside of the preserve is available at Baker, Barstow, Needles, and Nipton, Calif.

Roadside Camping (refers to designated sites near paved, graded, and two-track roads)

Roadside camping is permitted in areas that have been traditionally used for this purpose. By reusing existing sites, you help protect the desert from further damage. Sites with existing rock fire rings should be considered disturbed and suitable for roadside camping. Do not camp along paved roads or in day-use areas, and stay at least 200 yards from all water sources. The National Park Service encourages roadside campers to use the following, selected sites:

Near Kelbaker Road:

Rainy Day Mine Site

15.2 miles southeast of Baker on Kelbaker Road, then 0.3 miles northeast on the unsigned and very sandy road to the Rainy Day Mine. Four-wheel drive 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 the unpaved Kelso Dunes Road. One campsite is located south of the road, 1/4 mile past the marked trailhead. Several others are available 3/4 mile beyond, near a clump of trees. Except at these sites, roadside camping is prohibited along Kelso Dunes Road (including at the trailhead).

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:

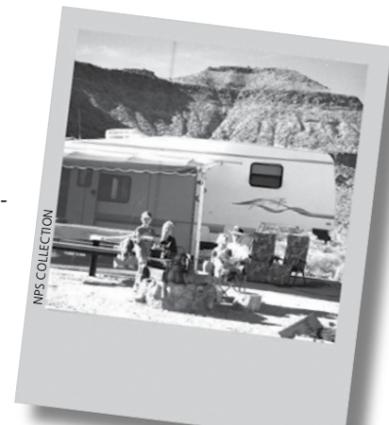
Black Canyon Road (East)

4 miles south of Hole-in-the-Wall Information Center on the east side of Black Canyon Road, above a wash and near a hill with views of the Providence Mountains. Another site is located about 4 miles further south, 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. High clearance and four-wheel drive recommended; no RVs.

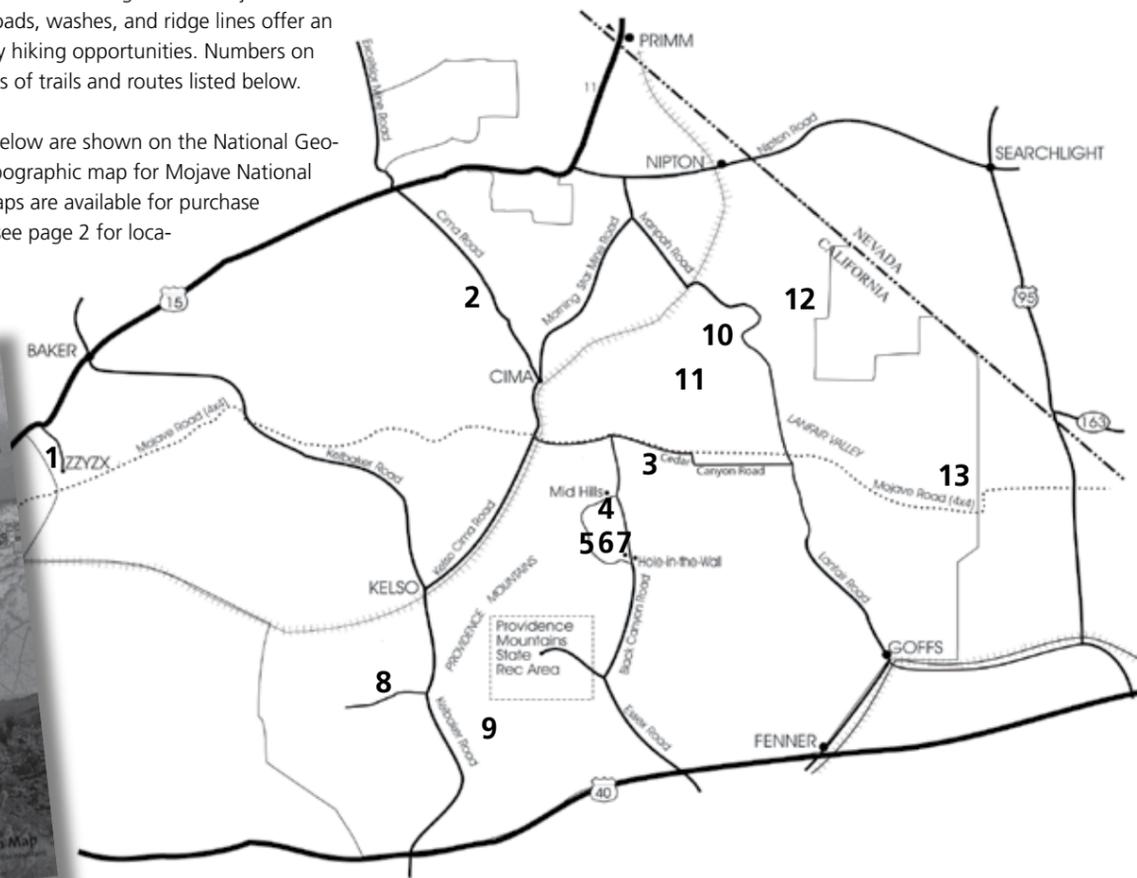
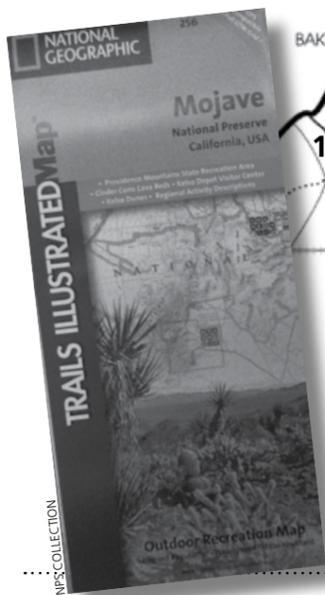


Hiking

Hikers at Mojave National Preserve can enjoy a variety of challenges, with sweeping views, solitude, and over 700,000 acres of designated Wilderness.

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

All trails and routes listed below are shown on the National Geographic Trails Illustrated topographic map for Mojave National Preserve. This and other maps are available for purchase at all information centers (see page 2 for locations and other info.).



Developed Trails

1) Lake Tuendae Nature Trail

Trailhead: Zzyzx parking area, 5 miles south of I-15 on Zzyzx Road.

Enjoy an easy, self-guided, ¼-mile stroll around Lake Tuendae. Wayside exhibits reveal the rich cultural and natural history of this oasis.

2) Teutonia Peak Trail

Trailhead: 12 miles south of I-15, or 6 miles north of Cima, Calif., on Cima Road.

Explore the world's densest Joshua tree forest en route to a rocky peak with expansive views of Cima Dome and beyond. Three miles round-trip.

3) Rock Spring Loop Trail

Trailhead: 5 miles east of Black Canyon Road on Cedar Canyon Road.

This one-mile loop begins at Bert Smith's Rock House and leads to Rock Spring. Wayside exhibits describe the spring's rich history, including Mojave Indian use and the U.S. Army's Camp Rock Springs. Return to the trailhead via a ridgeline with expansive views of the Hackberry and New York mountains.

4) Mid Hills to Hole-in-the-Wall Trail

Trailhead: Entrance to Mid Hills Campground, 2 miles west of Black Canyon Road on the north end of Wild Horse Canyon Road.

Hike 8 miles, one-way, through a maze of washes with barrel and cholla cacti, and evidence of the 2005 Hackberry Fire. Total elevation gain is 1,200 feet. Watch for trail route markers.

5) Rings Loop Trail

Trailhead: Hole-in-the-Wall Information Center parking area, 20 miles north of I-40 on Essex and Black Canyon roads.

Discover how Hole-in-the-Wall got its name as you ascend narrow Banshee Canyon with the help of metal rings mounted in the rock. The 1½-mile round-trip hike connects to the Mid Hills to Hole-in-the-Wall Trail (see above).

6) Hole-in-the-Wall Nature Trail

Trailheads: Hole-in-the-Wall Information Center and Campground, 20 miles north of I-40 on Essex and Black Canyon roads.

Learn to identify desert plants on this easy, ½-mile round-trip hike.

7) Barber Peak Loop Trail

Trailhead: Hole-in-the-Wall picnic area.

This 6-mile loop encircles Barber Peak just west of Hole-in-the-Wall Campground, passes the Opalite Cliffs, and returns to Hole-in-the-Wall via Banshee Canyon (and the Rings Loop Trail—see above).

8) Kelso Dunes

Trailhead: 3 miles west of Kelbaker Road on the well-graded, but unpaved Kelso Dunes Road. Hikers at sunrise and sunset are treated to both cooler temperatures and the rose-colored glow of the dunes. The roughly 3-mile round-trip hike might take several hours as you slog through the sand, then slide down the slopes.

Recommended Routes

The following routes are not established trails; trailheads might be unidentifiable or nonexistent. Check a detailed map or guidebook and consult a park ranger for route information.

9) Quail Basin

Start: 11 miles north of I-40 on Kelbaker Road, then 1 mile east on an unmarked dirt road. Park at junction with closed dirt road heading south.

High clearance & four-wheel drive recommended.

Follow the route to the south to a road that loops around a small valley. After walking the loop, return via the same route. The 6.5-mile round-trip route leads past jumbled rocks into a small valley of Mojave yucca and juniper surrounded by granite outcroppings.

10) Keystone Canyon

*Start: 18 miles south of Nipton Road on Ivanpah Road, then 2.5 miles west on an unmarked dirt road. Bear left at the first fork, right at the second, then continue to a parking area. **Four-wheel drive recommended.***

Hike the deteriorating road into Keystone Canyon, ascending the New York Mountains. Continue cross-country to the top of the ridge for spectacular views. Hike is 3 miles one way.

11) Caruthers Canyon

*Start: Primitive campsites in canyon: 5.5 miles west of Ivanpah Road on New York Mtns Road, then 2.7 miles north on unsigned road. **High clearance & four-wheel drive recommended.***

Hike 3 miles one way 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.

12) Castle Peaks Corridor

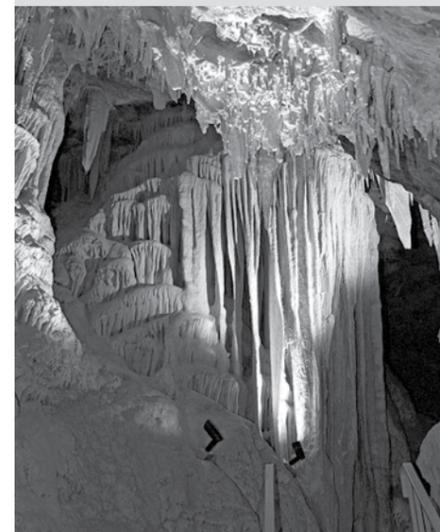
*Start: 4.9 miles east of Ivanpah Road on Hart Mine Road; left at fork, then 1 mile, left at fork, then 3.4 miles, crossing an earthen berm; left at fork, then 1 mile to road's end. **High clearance & four-wheel drive recommended.***

For excellent views of the Castle Peak spires, walk 4 miles one way up the closed road to the ridgetop and beyond into a small canyon.

13) Piute Creek

*Start: 9.5 miles east of the junction of Lanfair Valley and Cedar Canyon roads on a dirt utility road, then 0.5 miles north. **High clearance & four-wheel drive recommended.***

Hike 6.5 miles round-trip through colorful Piute Gorge and explore the ruins of Fort Piute, built and manned in the 1860s to protect mail and travelers on the Mojave Road. A perennial stream near the fort, rare in the Mojave, supports riparian plants and animals. Return to your vehicle via an unused trace of the Mojave Road.



Mitchell Caverns: A State Park within a National Preserve

Stalactites, stalagmites, helictites, shields, and draperies are but a few of the formations that decorate the interior of Mitchell Caverns at Providence Mountains State Recreation Area. Located just south of Hole-in-the-Wall on Essex Road, this 5,900-acre 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. The temperature inside the cave is a comfortable 65°F, so dress accordingly and wear sturdy shoes. Tour schedules are as follows:

Winter (Labor Day-Memorial Day)

Weekdays: 1:30 p.m.

Weekends: 10 a.m., 1:30 p.m., & 3 p.m.

Summer (Memorial Day-Labor Day)

Daily: 1:30 p.m.

Fees are \$6 for adults, \$3 for children under 16; children under six years old get in free. Tours are limited to 25 people. Reservations are not accepted for individuals or small groups, but are required for groups of 10 or more and must be made by calling at least three weeks in advance.

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 \$25 per night. Water and flush toilets are provided.

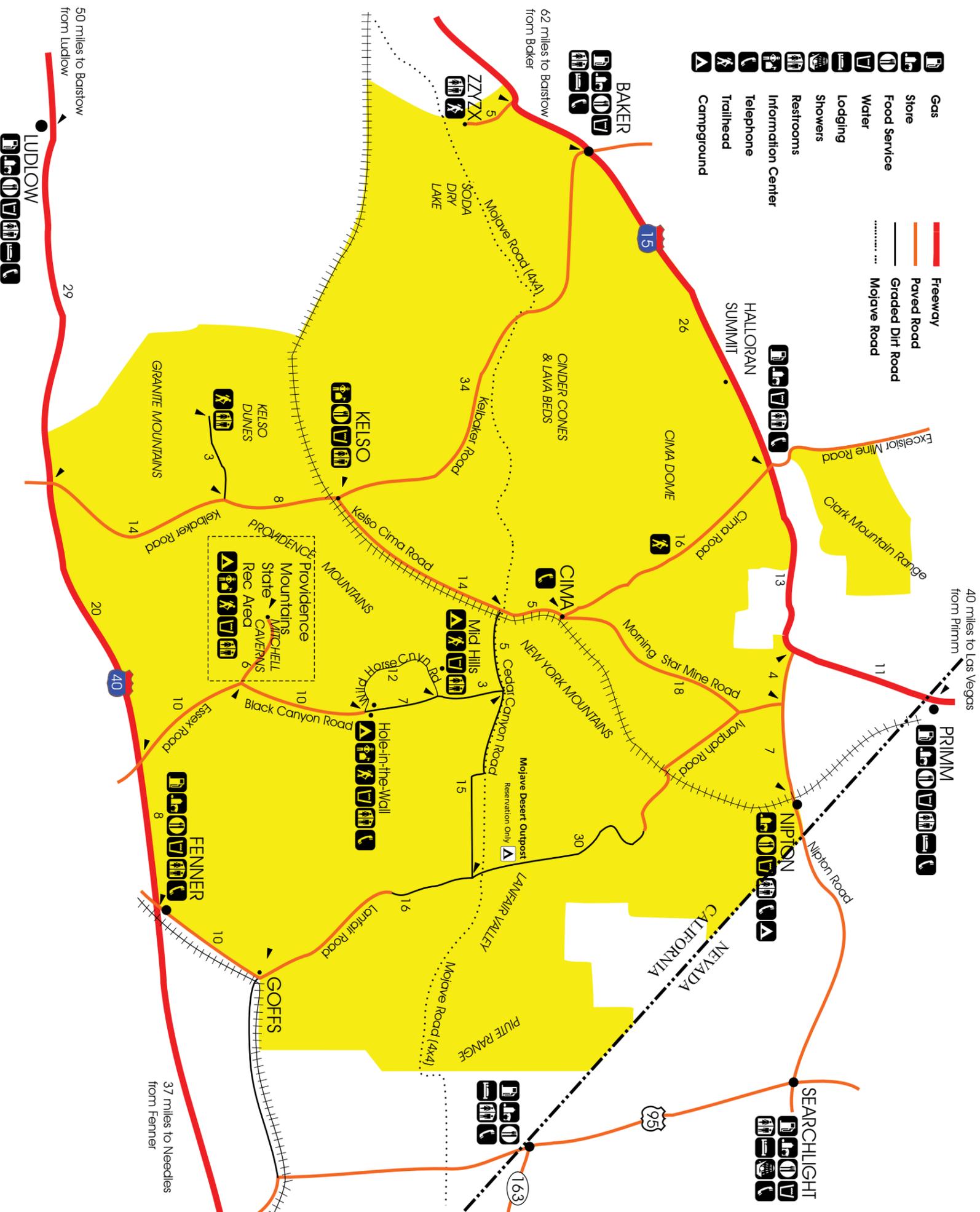
Three short trails—the Mary Beale Nature Trail (0.5 miles round-trip), Nina Mora Trail (0.5 miles round-trip), and Crystal Spring Trail (2 miles round-trip)—offer an introduction to the area's history, geology, and flora while providing outstanding views. Cross-country hikers can reach the peaks of the Providence Mountains. Groups planning to hike cross-country must have a free permit from the visitor center.

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



- Gas
- Store
- Food Service
- Water
- Lodging
- Showers
- Restrooms
- Information Center
- Telephone
- Trailhead
- Campground

- Freeway
- Paved Road
- Graded Dirt Road
- Mojave Road



Telephone Directory Emergency 911

Federal Interagency Communications Center 909-383-5651
San Bernardino County Sheriff - Baker 760-733-4448
San Bernardino County Sheriff - Needles 760-326-9200

Mojave National Preserve

Barstow Headquarters Office 760-252-6100
The Beaney @ Kelso (lunch room) 760-252-6165
Hole-in-the-Wall Fire Center 760-928-2573
Hole-in-the-Wall Information Center 760-252-6104 or 760-928-2572
Kelso Depot Visitor Center 760-252-6108

Nearby Parklands

Anza Borrego Desert State Park 760-767-4205
Bureau of Land Mgmt. - Barstow Field Office 760-252-6000
Bureau of Land Mgmt. - Needles Field Office 760-326-7000
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
Providence Mountains State Recreation Area 760-928-2586

Website Directory

National Park Service
Mojave National Preserve www.nps.gov/moja
Death Valley National Park www.nps.gov/deva
Joshua Tree National Park www.nps.gov/jotr
Lake Mead National Recreation Area www.nps.gov/lame

Bureau of Land Management www.blm.gov
California Desert www.californiadesert.gov
CSU Desert Studies Center (Zzyzx) <http://biology.fullerton.edu/dsc/>
Desert Discovery Center www.discoverytrails.org/welcome1.html
Desert Tortoise data and information www.deserttortoise.gov
DesertUSA wildflower reports www.desertusa.com/wildflor/wildupdates
Leave No Trace www.lnt.org
Mojave National Preserve Conservancy www.preservethemojave.org
Providence Mountains State Recreation Area http://www.parks.ca.gov/?page_id=615
Sweeney Granite Mtns. Desert Research Ctr. <http://nrs.ucop.edu/Sweeney-Granite.htm>
US Federal government jobs www.usajobs.opm.gov
Western National Parks Association (bookstore) www.wnpa.org
Wilderness information www.wilderness.net



WESTERN NATIONAL PARKS ASSOCIATION

