



# Mojave National Preserve

Black Canyon campground with a sky added from an astrophoto

COURTESY NASA/JET PROPULSION LABORATORY-CALTECH

## A Head Start for Endangered Tortoises?

By Phillip Gomez

An unpretentious little building surrounded by a security fence just off Ivanpah Road near the northeast entrance to Mojave National Preserve has an ambitious purpose: to improve the chances of baby desert tortoises to survive to maturity and to produce vital offspring.

The cryptic lives of tortoises—spent predominantly in underground burrows—and the many years that it takes for them to reach sexual maturity and to reproduce have made it difficult for conservation biologists to conduct field studies.

So, the National Park Service, together with the U.S. Fish and Wildlife Service, Chevron Corp., Molycorp Inc., and two universities have partnered to create a working facility to try to gain a better understanding of tortoise behavior that affects their survival. The Ivanpah Desert Research Facility is staffed by a small team of faculty and Ph.D. candidates from the Savannah River Ecology Laboratory of the University of Georgia and from the University of California, Davis.

For this long-term research project, juvenile tortoises are being “recruited” over a 20-year period and nurtured in this facility until they are capable of joining the Ivanpah Valley’s population with a reasonable chance for survival. The idea for this experiment in wildlife management, entitled Desert Tortoise Juvenile Survivorship at Mojave National Preserve—or Head Start to researchers—is similar to the principle underlying children’s nursery schooling: giving kids a head start in life.



NPS/GOMEZ

Two yearling tortoise siblings explore their enclosure. The smaller one follows “big brother,” who became sick and was taken inside for the winter.

In the case of the tortoise, the goal is to gain time for the reptile’s shell to develop and harden to make the young reptiles safe from predators. Adult tortoises with hardened shells have few predators, but juveniles are extremely vulnerable for the first four or five years of life.

“It’s all about the predation,” says Debra Hughson, the Preserve’s chief of science and resource stewardship. “The purpose of Head Start is to allow them to survive.” How many tortoises are there in the Preserve? “Nobody knows exactly, but only

a small percentage make it to adulthood,” Hughson said.

This, coupled with the late maturity of the tortoise, which can take 18 to 20 years to reach breeding age, makes for long odds in the game of survival in the desert.

Once numerous in the Mojave, the desert tortoise began experiencing loss of natural habitat from a variety of sources by the late 1980s: exurban sprawl, overgrazing by livestock, poaching, invasive plants, development of highways and dirt roads, and expanding use of off-road recreational vehicles. The degradation and fragmentation of habitat create barriers for the slow-moving tortoise in its search for food and water and also bring danger from motorists and off-roaders. Eggs of the unborn are sometimes trampled. Also, the lives of many are cut short by an upper-respiratory disease, possibly introduced into the desert by sick pet tortoises that were turned loose by their owners.

Tortoise numbers have diminished by as much as 90 percent in some areas of the Mojave, according to Hughson.

In August 1989, the California Fish and Game Commission listed the desert tortoise (*Gopherus agassizii*) as a threatened species under the U.S. Endangered Species Act of 1973. The U.S. Fish and Wildlife Service followed suit with federal protection in 1991.

The Preserve was created in 1994 under the California Desert Protection Act, federal legislation that was intended to protect remaining California desert wild lands. The act called for large-scale management of the Mojave bioregion west of the Colorado River in conjunction with Joshua Tree and Death Valley national parks, as well as the Bureau of Land Management (BLM).

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NPS/KNIGHTEN

### Welcome to Mojave!

Welcome to Mojave National Preserve. We are glad you have made the decision to spend some of your time exploring and discovering the treasures of the Mojave Desert.

You have chosen a special time to visit us—one of the more than 400 sites within the National Park Service—because we have begun celebrating 100 years of sharing America’s special places and helping Americans to make meaningful connections with nature, history, and culture. The National Park Service was established in 1916 to oversee the administration of these special places.

As part of its centennial, the National Park Service is inviting a new generation to discover the special places that belong to us all. We are encouraging new audiences and people not familiar with the National Park Service and public lands to find their park. Many people visit Mojave National Preserve the traditional way, in person. We also invite you to explore and discover the Preserve through our social media sites, including our webpage and Facebook site and via Twitter. Over the next two years, we will be increasing the content that we have on our social media sites in an effort to reach out to new audiences and to bring more visitors to the Preserve.

The national parks are America’s best idea, and we want all Americans to help us celebrate these special places. You can help us do this. Share your experience with others by talking with your friends and neighbors about what you saw or did while here and post it to social media using #FindYourPark or FindYourPark.com

Enjoy the peace of the desert environment, find yourself, and FindYourPark.

*Todd J. Suess*

Todd J. Suess  
Superintendent

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## An unexpected threat to Desert Bighorn Sheep, page 4

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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.

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National Park Service employees care for America's national parks and work with communities across the nation to help preserve local history and to create close-to-home recreational opportunities.

# Desert Safety Tips

**THE MAIN CAUSE OF DEATH IN MOJAVE**  
More people die in single-car accidents due to speeding than by any other means. Reduce your speed.

**DO NOT DEPEND ON A GPS NAVIGATION SYSTEM**  
GPS maps of remote areas, including Mojave National Preserve, are notoriously unreliable. Carry a folding map.

**CARRY AND DRINK PLENTY OF WATER**  
Carry a minimum of a gallon per person per day in your vehicle even if you are just passing through. You will need it in an emergency. Carry more if you plan to be active. Fluid and electrolyte levels must be balanced, so have salty foods or "sports drinks" handy as well.

**BACKCOUNTRY TRAVEL**  
Hikers, backpackers, and those traveling on dirt roads need to be self-reliant and well-prepared. Plan ahead, carry detailed maps, and let someone know



your plans.  
**FLASH FLOODS**  
While driving, be alert for water running in washes and across dips in the road. When hiking and camping, avoid canyons and washes during rain storms, and be prepared to move to higher ground.

**DRESS PROPERLY FOR HIKING**  
Wear loose-fitting clothing and sturdy shoes that protect your feet from rocks and cactus. Use sunscreen and wear a hat. Carry a light jacket as temperatures drop dramatically when the sun goes down.

**AVOID HIKING IN EXTREME HEAT**  
Do not hike in the low elevations when temperatures are high; the mountains are cooler in summer.

**WATCH FOR SIGNS OF TROUBLE ON HOT DAYS**  
If you feel dizzy or nauseated, or if you develop a headache, get out of the sun immediately, and drink water or sports



drinks. Dampen clothing to lower body temperature. Be alert for symptoms in others.  
**DANGEROUS ANIMALS**  
Never place your hands or feet where you cannot see first. Rattlesnakes, scorpions, or black widow spiders might be sheltered there.

**MINE HAZARDS**  
Never enter a mine. They are unmaintained and unstable, and you might encounter pockets of bad air or poisonous gas. Stay out, and stay alive!

**IN CASE OF EMERGENCY**  
Cell phones do not work in many areas. Try moving uphill to get a signal. To call for help, dial 911 or the Federal Inter-agency Communications Center at 909-383-5651. After calling, stay with your car until help comes.



## 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 on Kelbaker Road, 34 miles southeast of Baker, CA. Open seven days per week from 9 a.m. to 5 p.m. Closed on Christmas.

**Hole-in-the-Wall Information Center**  
Located near Hole-in-the-Wall Campground.

**Headquarters Information Center**  
Located at 2701 Barstow Road, Barstow, Calif. Open Monday through Friday, 8 a.m.–4:00 p.m.

**Food**  
Limited snacks are available in the Western National Parks Association stores at Kelso Depot Visitor Center and Hole-in-the-Wall Information Center, but there is no restaurant. Restaurants are located along I-15 at Barstow and Baker, Calif. and along I-40 at Ludlow, Fenner, and Needles, Calif.

**Water**  
Drinking water is available only at Kelso Depot Visitor Center, Hole-in-the-Wall Information Center, Hole-in-the-Wall, Black Canyon and Mid-Hills campgrounds.

**Gasoline**  
There are no gasoline stations within Mojave National Preserve. Gasoline can be purchased along I-40 at Needles, Fenner, and Ludlow, Calif., along I-15 at Baker, Calif., the Cima Road exit, and Primm, Nev., and along U.S. 95 at Searchlight and at the Nev.163 junction south of Cal-Nev-Ari, Nev.

**Lodging**  
There are no motels within Mojave National Preserve. Lodging may be available in Barstow, Nipton, Ludlow, Needles, Baker, and Twentynine Palms, Calif., and in Primm and Searchlight, Nev.

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

**Pets**  
Although not allowed inside information centers, pets are welcome elsewhere. They must be leashed and never left unattended. Dogs used during hunting activities must be under the owner's control at all times. Pet excrement must be collected and disposed of in garbage receptacles.

**Permits**  
Permits are required for all organized events, group events (more than 15 individuals or 7 vehicles), and commercial activities such as filming. Fees apply. Proof of insurance and posting of a bond might also be required. Call 760-252-6107 or visit [www.nps.gov/moja](http://www.nps.gov/moja) for more information.

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

Target shooting or "plinking" is prohibited. All firearms transported within the preserve must be unloaded, cased, and broken down, except during lawful hunting activities. No shooting is permitted within 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.

**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.

**Private Property**  
Private inholdings are found throughout the preserve. Please respect the rights of our neighbors. It is your responsibility to obtain 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. Watch for cattle on roadways.

**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. Firewood might be available for purchase at Baker, Fenner, Needles or Nipton, Calif. Campfires are allowed in campground 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.

# Exploring Mojave

## 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. While much of Mojave's wild and historic splendor is available only to those who travel its trails and unmaintained roads, the primary roads of the preserve offer endless opportunities for exploration (see map on page 8).

### Kelbaker Road

A 56-mile paved road stretching from I-15 at Baker, Calif. in the north to I-40 east of Ludlow, Calif. in the south, Kelbaker Road winds past cinder cones, lava flows, Kelso Depot, Kelso Dunes, and the Granite Mountains.

### Cinder Cones & Lava Flows

No signs or services.

About 14 miles southeast of Baker, Kelbaker Road traverses a 25,600-acre area of lava flows and volcanic cinder cones thought to range in age from 10,000 to 7 million years old.

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

Aiken Mine Road (19 miles southeast of Baker, Calif.) offers an interesting side trip through the heart of the area and access to a lava tube. **High clearance and four-wheel drive recommended.**

### Kelso Depot Visitor Center

Information, exhibits, orientation film, art gallery, bookstore, restrooms, water, picnic area. Open every day but Christmas. Located 34 miles southeast of Baker, Kelso Depot began operation in 1924 and served as train station, restaurant, and employee housing on the Los Angeles and Salt Lake route of the Union Pacific Railroad. Now Mojave National Preserve's principal information center and museum, the Depot offers extensive exhibits that describe the cultural and natural history of the preserve. Historically furnished rooms offer a glimpse into Kelso's past.

### Kelso Dunes

Self-guiding trail, pit toilets, no water.

About 42 miles southeast of Baker (8 miles south of Kelso Depot), then 3 miles west on a graded dirt road. Nearly 700 feet high and covering a 45-square-mile area, the Kelso Dunes were created over the course of 25,000 years by winds carrying sand grains from the dried Soda Lake and Mojave River Sink located to the northwest. The Providence and Granite mountains served as barriers that trapped the blowing sand. The dunes produce a "booming" or "singing" sound when sand with the right moisture content slides down the steep slopes. Try it for yourself—run down a dune slope (but don't trample vegetation!) to initiate the sound.

### Granite Mountains

No signs or services.

An imposing jumble of granite marks the south entrance to the preserve, 50 miles southeast of Baker on Kelbaker Road. Portions of the Granite Mountains lie within the University of California's Desert Research Center; please respect the signs that mark the boundary. **High clearance and four-wheel drive recommended.**

### Clark Mountain

No signs or services.

The only portion of Mojave National Preserve north of I-15, Clark Mountain 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. Check detailed maps or ask a ranger for access information. **High clearance and four-wheel drive recommended.**

### Cima Road

About 26 miles east of Baker, Calif., the paved Cima Road connects I-15 with Cima, Calif., 16 miles to the southeast.

### Cima Dome & Joshua Tree Woodland

Self-guiding trail, no water.

The near-perfect symmetry of Cima Dome rises 1,500 feet above the surrounding desert and is home to the world's largest concentration of Joshua trees. The top of the dome is located west of Cima Road, this unusual geologic feature is best seen from a distance. Try the view looking northwest from Cedar Canyon Road, 2.5 miles east of Kelso Cima Road.

### White Cross World War I Memorial

Located 12 miles south of I-15 on Cima Road, this memorial is owned and operated by the Veterans of Foreign Wars.

### Cedar Canyon & Black Canyon Roads

Mostly unpaved, the 20-mile Cedar Canyon Road connects Kelso Cima Road in the west with Ivanpah Road in the east, paralleling (and sometimes joining) the historic Mojave Road. Black Canyon Road (unpaved north of Hole-in-the-Wall) connects Cedar Canyon Road with Essex Road, 20 miles to the south.

### Rock House

Loop trail, wayside exhibits, pit toilet, picnic table.

5 miles east of Black Canyon Road on Cedar Canyon Road. The Rock House is emblematic of creative desert building styles. Nearby Rock Spring, located along the loop trail, was the site of a military outpost along the Mojave Road.

### Mid Hills

Campground, trailhead, pit toilets, water.

Not recommended for RVs.

About 2 miles west of Black Canyon Road at the north end of Wild Horse Canyon Road, Mid Hills supports pinyon-juniper woodland habitat. The effects of a fire that swept through the area in June 2005 are evident, although several campsites in the popular campground still contain shady stands of pinyon pine and juniper.

### Hole-in-the-Wall

Information center, bookstore, campgrounds, picnic area, trailhead, restroom, water, telephone. Just north of the junction of Black Canyon and the south end of Wild Horse Canyon Roads, rhyolite cliffs riddled with holes and hollows are the backdrop for Hole-in-the-Wall.

### Piute Spring

About 7.4 miles west of U.S. 95 on the unmarked and unpaved Mojave Road, then 3.1 miles west on an extremely rough unmarked dirt road. **High clearance and four-wheel drive recommended.**

### Fort Piute and Piute Spring

Trails, wayside exhibits, no services.

Willows, cottonwoods, and rushes thrive along a half-mile section of Piute Creek. Fort Piute (still visible) was one in a string of military outposts built along the Mojave Road. Please don't climb on the foundations or remove anything.

## 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.



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### Zzyzx Road

Six miles southwest of Baker on I-15, Zzyzx Road leads 5 miles south into the preserve along the western shore of Soda Dry Lake.

### Zzyzx/Soda Springs

Self-guiding trail, wayside exhibits, pit toilets, non-potable water, picnic area.

Historically known as Soda Springs and later renamed Zzyzx (pronounced ZYE-zix), this oasis is home to the California State University Desert Studies Center. The 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. Please do not disturb participants when classes are in session.

### Nipton, Ivanpah & Lanfair Roads

Eleven miles south of Primm, Nev., Nipton Road begins at I-15 and passes through Nipton, Calif., 11 miles east. Ivanpah Road (only the 10 northernmost miles paved) heads southeast of Nipton Road, through the Ivanpah and Lanfair valleys, eventually connecting with the paved Lanfair Road and the Fenner Valley. Together stretching 46 miles, Ivanpah and Lanfair roads connect the northern preserve boundary (bordering Nipton Road) with the southern near Goffs, Calif.

### Hotel Nipton

NPS exhibits; privately operated hotel, store, & campground; for information call 760-856-2335 or email at stay@nipton.com.

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

### Caruthers Canyon

Primitive camping, hiking, no signs or services. About 5.5 miles west of Ivanpah Road on New York Mountains Road, then 2.7 miles north on an unsigned road, Caruthers Canyon is located in the rugged New York Mountains. Surrounded by mountains rising over 7,500 feet, a botanical "island" of chaparral plants remains from wetter times of the past. **High clearance and four-wheel drive recommended.**

## Sand & Mud Driving Tips

- Be sure to carry plenty of drinking water and emergency supplies.

- Engage four-wheel drive before entering deep sand or mud.

- Don't gun the engine—this will spin the tires, dig you in deeper, and could bury your vehicle to the frame. Smooth, easy power is better than too much power; use low gearing and just enough throttle to maintain forward movement.

- If you detect a loss of traction, turn the steering wheel rapidly from side-to-side—this might help to generate traction.

- If your vehicle gets stuck, place solid materials (such as floor mats) under the tires to provide traction.

- If you're really stuck, it's best to stay with your vehicle. A stationary, stranded vehicle is much easier to locate than a person traveling on foot. Avoid strenuous activity during the heat of the day; stay in the shade of your vehicle.

### Lanfair Valley

No signs or services. Mojave Desert Outpost, a privately-owned campground, is located here. For information call 951-780-3179.

South of the New York Mountains along Ivanpah and Lanfair roads, 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 to miners in the mountains beyond. While little evidence remains of homesteads that once dotted the valley, tracts of private property still exist. Please respect the rights of landowners.



Members of the Old Town Sidewalk Astronomers set up telescopes in Black Canyon Group & Equestrian Campground for an annual Star Party. Left to right: Jane and Morris Jones, Todd Kunioka, Jim Stears, and Gary Spiers.

## Look Up for a Wonder of Mojave's Clear, Tranquil Summer Evenings

By Phillip Gomez

On a still, clear night in Mojave National Preserve, there's nothing so tranquil as going outside well after nightfall, lying in a hammock, and looking up at the distant stars.

From my favorite perch, they're framed in the foreground by the tangled, shadowed limbs of two Joshua trees. A chorus of crickets provides the background music in the surrounding shrubs. Bats zip around me chasing insects. An owl yips leisurely with long, silent intervals in the tree branches above before gliding away in a low swoop.

Stargazing has become increasingly popular at remote southwestern parks such as Death Valley, Joshua Tree, and Great Basin, and at Organ Pipe Cactus National Monument and the Preserve. Mojave hosts periodic "star parties", inviting visitors to gaze at the night sky through telescopes. The National Park Service encourages visitor activities like stargazing and active listening for wildlife sounds as fundamental resource values for the enjoyment of desert solitude.

On a moonless night and with a clear view of summer's nighttime constellations,

anyone can enjoy this park resource: inky night skies full of stars—the Milky Way above and a natural soundscape below. The clean, sweet-smelling night air of the Mojave wilderness, as well as other areas of the Preserve, becomes a haven for those seeking quiet, relaxing, or contemplative settings.

Get a compass along with a good star chart and find the constellation Sagittarius. It's just above the southern horizon and below the band of stars in the Milky Way. This constellation looks like a tea kettle, its spout steaming up the Sagittarius Star Cloud in the heart of the galaxy.

Another easily seen and well-known constellation in the southern sky is the large constellation of Scorpio. The stinger tail of this familiar desert figure curls around just to the right of Sagittarius, then heads north of the Milky Way's star clouds. Sagittarius includes the beguiling red-gold star Antares, one of the largest-known stars, 700 times the diameter of our sun.

Taking in the dark night skies and the natural soundscapes of the desert's biotic communities draws you into what one expert calls "the basic happenings" of life. As Paul Bogard, author of *The End of Night: Searching for Natural Darkness in an Age of Arti-*

*ficial Light*, describes the research on wildlife and artificial night lighting, most plants and animals depend on natural patterns of darkness. Light pollution threatens desert biodiversity "by forcing sudden change on habits and patterns that have evolved to depend on light in the day and darkness at night." While most of us are asleep indoors, "outside the night world is wide awake with matings, migrations, pollinations, and feeding—in short, the basic happenings that keep world biodiversity alive."

Urban light pollution spilling over into nearby rural areas can spoil sky watchers' viewing of the stars, even in the Preserve. "The light from Las Vegas may not stay in Vegas," says Bogard. But ignoring the urban glow to the north of the brightest city in the world, sky watchers at Mojave can turn to its southern sky for a more fabulous entertainment: primitive darkness.

The summer season is an excellent time of year for viewing the Milky Way Galaxy, the irregular band of 200 billion stars stretching across our night sky as a thin, hazy cloud. For those with the patience to look and learn, these distant suns produce a faraway radiance that more than rivals the lights to the north.

The light from the galactic core of the Milky Way "merges like melted gold to create this glowing band," says Bob Berman in *Secrets of the Night Sky: The Most Amazing Things in the Universe You Can See*

with the Naked Eye. "Focus your binoculars and tens of thousands of stars spring into sudden visibility, the gentle radiance behind these newcomers indicating that still more unresolved stars lurk behind them. . . More, still more, who knows how many billions more unresolved suns always lie farther in the distance."

Back on earth, Bogard sadly reports that eight out of every ten children born in the United States today will never know a night dark enough that they can see the Milky Way. Because most of us live in increasingly over-lighted cities, 80% of Americans will never understand the meaning of the well-known British nursery rhyme *Twinkle, Twinkle Little Star* that was published in 1806, well before the advent of artificial light.

The rhyme "How I wonder what you are" is lost on anyone who has never had the opportunity of seeing bright, shining stars against the dark night sky. The rhyme suggests mystery, a wonder we can only begin to understand by experiencing it ourselves.

Stars are natural resource wonders, best appreciated in dark, arid clean-air landscapes in Mojave and other remote national parklands in the desert Southwest.

## Remote Backcountry Habitat Harbors the Rugged Desert Bighorn Sheep

By Robert Mills

Those who have had the joy of witnessing a Desert Bighorn Sheep standing on a jagged peak, silhouetted against a sun-lit blue sky, would be quick to agree that they have seen one of the most majestic animals to roam Mojave National Preserve.

Shy and inhabiting remote and rugged desert mountain terrain, they travel across valleys from one mountain to the next, avoiding other creatures. It is a fortunate photographer who captures these magnificent creatures on film, as photo opportunities are fleeting. The Bighorn (*Ovis Canadensis nelsoni*) is surprisingly fast and agile on the rugged terrain, so merely sighting one of these creatures is generally reserved for those willing to venture into this difficult habitat.

While both males and females grow horns, it is only the males that sport the big horns that give the animals their name. A mature set of horns takes about seven years to grow and can measure 30 inches from base to tip.

In this harsh environment, the Bighorn survive on ephemeral shrubs and catclaw. It survives because of a complex digestive process that extracts nutrients efficiently.

The Bighorn has adapted to the limited desert water supply by extracting moisture from green winter vegetation. During the drier

summer months, Bighorns visit watering spots frequently during the summer and linger a quarter of an hour to an hour, minimizing their exposure to predators.

An estimated 600 Bighorn inhabit Mojave National Preserve. They live ten to 15 years in the wild. The females (ewes) weigh 75 to 130 pounds, while the males (rams) weigh 140 to 220 pounds. At age two, ewes generally deliver one lamb, rarely two, in late spring after a six-month gestation.

The Bighorn has few natural enemies. There are reports of eagles killing a lamb or of multiple eagles taking down a sick adult. Every now and then, a mountain lion manages to catch one, but the bighorn's habitat in some of the desert's most difficult terrain generally shields them from natural predation.

In the past few years, the Bighorn's biggest threat has come, not from natural predators, but from domesticated animals—mainly sheep. There have been Bighorn sheep die-offs dating back to the 1840s. Research based on carefully controlled studies shows that grazing of domestic sheep in or near Bighorn habitat leads to transfers of diseases that prove fatal for the Bighorn.

The most recent report was supplied after an outbreak in a penned Bighorn population at Lava Beds National Monument nearly 30 years ago. The Bighorn had been penned there

since 1971 without any reports of disease. But in 1980, nose-to-nose contact was observed between Bighorns and domestic sheep that were grazing on adjacent National Forest Service land. The Bighorn Sheep began dying of pneumonia two weeks later. All 43 died within a short time.

An experiment to establish a connection between contact with domestic sheep and the Bighorn deaths was conducted. Scientists extracted the bacteria that caused the Bighorn deaths from four healthy domestic sheep, tagged it with fluorescent protein, and then reintroduced it into the four sheep.

The Bighorns and domestic animals were penned 33 feet apart for one month, with the Bighorns showing no symptoms of pneumonia. The animals then were allowed to have nose-to-nose contact for two months. Four Bighorn Sheep contracted the marked virus. The infected animals were then penned together, and all four Bighorns died within nine days. The lungs of all four Bighorns showed signs of the pneumonia, and the tagged bacteria was isolated from all four animals.

In ten experiments, all 23 Bighorn sheep involved died of respiratory disease following contact with domestic sheep.

In August of 2011, following reports of domestic sheep roaming Desert Bighorn habitat in the Nevada Snowstorm Mountains, Big-

horns began dying of pneumonia in great numbers. This has become all too common in the American West, and, unfortunately, the Bighorns of the Preserve were not spared.

In 2012, biologists discovered about 40 dead Bighorns in the Mojave within or near the Preserve. All showed indications of having died from the suspect pneumonia. Upon investigation, rangers found domestic sheep carcasses and domestic sheep pellets in areas of the park.

Not all Bighorn die-offs can be linked to contact with domestic animals. The 1995 die-off was related to botulism. But investigation usually finds evidence that domestic sheep were in the area before a die-off occurred.

On the question of preventive measures, inoculations work for only a short time, and capturing the animals in their rugged habitat would be extremely difficult. The only effective course of action to protect the Bighorn is to ensure that there is absolutely no contact between them and domestic animals—especially sheep and goats.

To this end, signs have been posted at Preserve entrances barring transport or grazing of domestic goats and sheep. It is hoped that with this precaution and the ongoing attention of wildlife biologists, the remaining Bighorns will survive to regenerate the population.

## Protect the Desert Tortoise

### Don't dump or litter.

Garbage attracts ravens and other predators that feed on tortoise eggs and hatchlings.

### Don't release pet tortoises into the wild.

They may carry diseases that will spread to wild tortoises. Contact a ranger to learn about tortoise adoption programs.

### Check beneath your vehicle before driving away.

Tortoises sometimes rest in the shade of a car.

### Do not take a tortoise.

It is illegal to remove tortoises from the wild.

### If you see a tortoise, stay back.

Approaching too closely may cause a tortoise to spray urine in self-defense—a potentially fatal loss of fluid.

### Reduce driving speeds and watch for tortoises on desert roadways.

## A Head Start for Endangered Tortoises?

*continued from page 1*

Also in 1994, the U.S. Fish and Wildlife Service completed its Desert Tortoise Recovery Plan, another milestone in large-scale ecosystem planning. The plan required the National Park Service and BLM to work together in planning for the recovery of the threatened species.

In the summer of 1996, Molycorp Inc. (not the company that currently goes by that name), operated an open-pit mine and chemical-processing facility between Clark Mountain and Interstate 15 near the Preserve. The company incurred federal, state, and county liabilities after a wastewater pipeline ruptured at the site, spilling 350,000 gallons of water contaminated with hazardous heavy metals and low-level radioactive waste.

The spill represented up to 100 times acceptable levels, according to Eric C. Nyström in his administrative history of the early years of the Preserve. The cleanup cost the mining company \$3.6 million. It also diverted Preserve staff from their regular duties to install four miles of fencing to keep tortoise away from the ground

that was polluted with toxic waste.

By the late 1990s, Chevron Corp. had acquired UNOCAL, Molycorp's owner since 1977, and with that purchase came the liabilities for Molycorp's spill. Chevron and its subsidiary, Chevron Environmental Management Co., now had to deal with the legacy of the spill.



Ordinarily, under the Endangered Species Act, compensation paid to a federal agency for damages to habitat would be settled with the purchase and donation of selected land parcels. Instead, an idea arose for construction of a

seven-acre research facility in the Preserve to help the population recover using predator-proof holding pens for young tortoise.

"It's basically just what we wanted for compensation," says Hughson. "Chevron also provided \$500,000 for research and operating expenses." The National Park Trust handles the funds transfer for the National Park Service.

The facility is used to conduct experiments to support the recovery work, including a study that would help identify habitat preferences. In these experiments, researchers attach tiny radio transmitters to tortoises that are then released and tracked.

Previous studies discovered their attraction to the shoulders of Preserve roadways, where runoff after rains provides drinking water and lush vegetation. Unfortunately, this can lead to deadly impacts with passing automobiles.

The new research will arm researchers with additional information about tortoise behavior that endangers their survival. Researchers hope that the benefits of nurturing and studying this new generation of tortoise will have a significant impact.

"The idea is to augment the natural population in the wild," Hughson says. "The baby tortoises are protected from predators in regulated pens, segregated by age."

Most have minimal interactions with the researchers to maintain their fear of humans—also necessary for their survival.

The project is intended to continue indefinitely, addressing new tortoise management issues as they arise.

"It's not just for the Preserve and other parks administered by the Park Service, but for tortoises found on BLM lands and in Fish and Wildlife reserves, too," she said. "It's for the recovery of the species."

### Mojave Temperatures: Average High / Low

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

# Park Roads: A 200-Year Journey



Mojave's roads, descendants of trails worn on the desert floor by ancient peoples, are modern pathways through wild, scenic landscapes.

By David Moore, Chief of Maintenance

On Monday, September 9, 2013, the care and maintenance of the 165 miles of paved roads and 70 miles of dirt roads within Mojave National Preserve (Mojave NPRES) became the responsibility of the National Park Service following a Federal Court decision removing them from the jurisdiction of San Bernardino County. This created a big change in maintenance operations which had formerly been responsible for only a few miles of dirt road.

Many of today's major paved roads in Mojave NPRES had not been improved until the 1970s and '80s. This was done to increase the safety for passenger vehicles to drive through Mojave NPRES. But the need for good travel routes in the desert dates well before these fairly recent times.

Early Europeans, like Father Francisco Garcés, a Spanish Franciscan priest living at Mission San Xavier, near present-day Tucson, Arizona, recorded the existence of a route across the Mojave Desert in the 1770s. His group was guided several times by members of the Mojave Tribe of the Colorado River through the Mojave Desert to the California Central Valley and The San Gabriel Mission. The Mojave and other tribes had traded pottery, seashells, and other goods with coastal tribes for centuries. In later years, those who traded and explored in the Mojave Desert on these same routes found it to be a long walk between known springs. Commerce and trade continued to impact the desert as miners in the 1800s searched for and found gold and silver. They established dirt roads between their mines and nearby towns to get their ore to markets.

In April 1912, the National Old Trails Road Association was formed to create a trans-continental trail (road) system that linked Baltimore and Los Angeles. The Automobile Club of Southern California began posting signs to define a proposed route that came through Southern California, and by 1917 much of the route was in place. This route, a hardened dirt road, was very difficult to drive. This National Trails Highway would later be known as Route 66.

It wasn't until the late 1920s that this road was widened and oiled. Oiling roads quickly became the preferred method over watering to control dust as it also hardened the surface of dirt roads.

Another early road treatment used in California was invented in the 1820s by Scottish engineer John Loudon McAdam. It was called macadam. A layer of crushed stones was laid on the driving surface, mixed with existing soil, then coated with a type of asphalt/oil-based binder and compressed to form a hard, solid surface. Many of the first paved roads in Mojave NPRES were made this way, not in the 1800s but late 1900's. On sections of north Kelbaker Road, small sticks and larger stones can still be seen locked in pavement that was made using the macadam method. Macadam paving is effective in light traffic areas and costs less to use than the bituminous concrete (asphalt) pavement that is now widely used.

Pavement does not last forever without some care and attention. Many of the Mojave NPRES roads have become dried out and prone to cracking, leading to the creation of potholes. Some sections of our roads have deteriorated faster than others due to the impact of rain and freezing temperatures in the winter.

The care of our paved and dirt roads has been a top priority and a challenge for Mojave NPRES. Since 2013, we have hired temporary road crews, gained assistance from Death Valley and Joshua Tree National Parks road crews, and purchased some road maintenance equipment and materials to help us with this new work load.

At Mojave NPRES, a lot can be accomplished with everyone working together. On April 8, 2015, a road rescue team was formed with volunteers from our visitor protection, administration, fire crew, maintenance, interpretive, and resource management staffs. Our Superintendent, Todd Suess, also joined in the work. The rescue team cleaned roadsides, hauled asphalt, controlled traffic, and shoveled the heavy black filling material into potholes.

Smiles and brightly colored vests used by highway crews were the order of the day as we all worked together on that beautiful spring



Mojave fire crew, rangers, office workers, managers, and other staff volunteer to fill potholes on Morning Star Mine Road.

morning to improve the roads for visitors. I am typically tied to a desk and a computer during my work day, so being outside and getting that huge sense of instant accomplishment of filling a pothole was welcome.

There is hope that special measures like this won't be needed in our future.

By the end of June 2015, 40 miles of our paved roads received a new chip seal top coat of a special asphalt emulsion covered by gravel. The road work included patching, thin-pavement overlays, and crack sealing. Crack sealing places specialized materials into or above cracks to prevent the intrusion of water and other materials and reinforces the adjacent pavement. The roads treated included the northern three miles of Ivanpah Road, followed by Morning Star Mine Road, Kelso Cima Road, and Zzyzx Road.

In 2016, the majority of the remaining 110 miles of paved roads in Mojave NPRES that were not treated this year will be resurfaced, subject to available federal funds. All the resurfaced paved roads will then be placed on a multi-year cyclic re-treatment program, again subject to available funding.

All that brings a smile to my face.

# Camping & Backcountry Travel

## Backcountry Guidelines & Regulations

Backcountry travel and camping—backpacking, roadside 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](http://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 roadside 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 (i.e., the crest of the dunes) or 1/4 mile south of the Kelso Dunes access road. (Exceptions may apply for roadside 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

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## 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 basecamp 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. About half of the 26 campsites were left unharmed, however—they 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. Ideal for both large groups and for riders - bring your own horse! Permits required for large groups (see p.2 for permit information).

## Nearby Camping Areas

### 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 is also available at Baker, Barstow, Needles, and Nipton, Calif.

Inside Mojave National Preserve, Mojave Desert Outpost is a private campground on Lanfair Road. For information call 951-780-3179 or check [www.mojavedesertoutpost.com](http://www.mojavedesertoutpost.com).

## Roadside Camping

Roadside vehicle 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. Many roadside camping sites cannot accommodate multiple vehicles; please don't enlarge them. 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. Campsites are behind the White Cross World War I Memorial. 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.



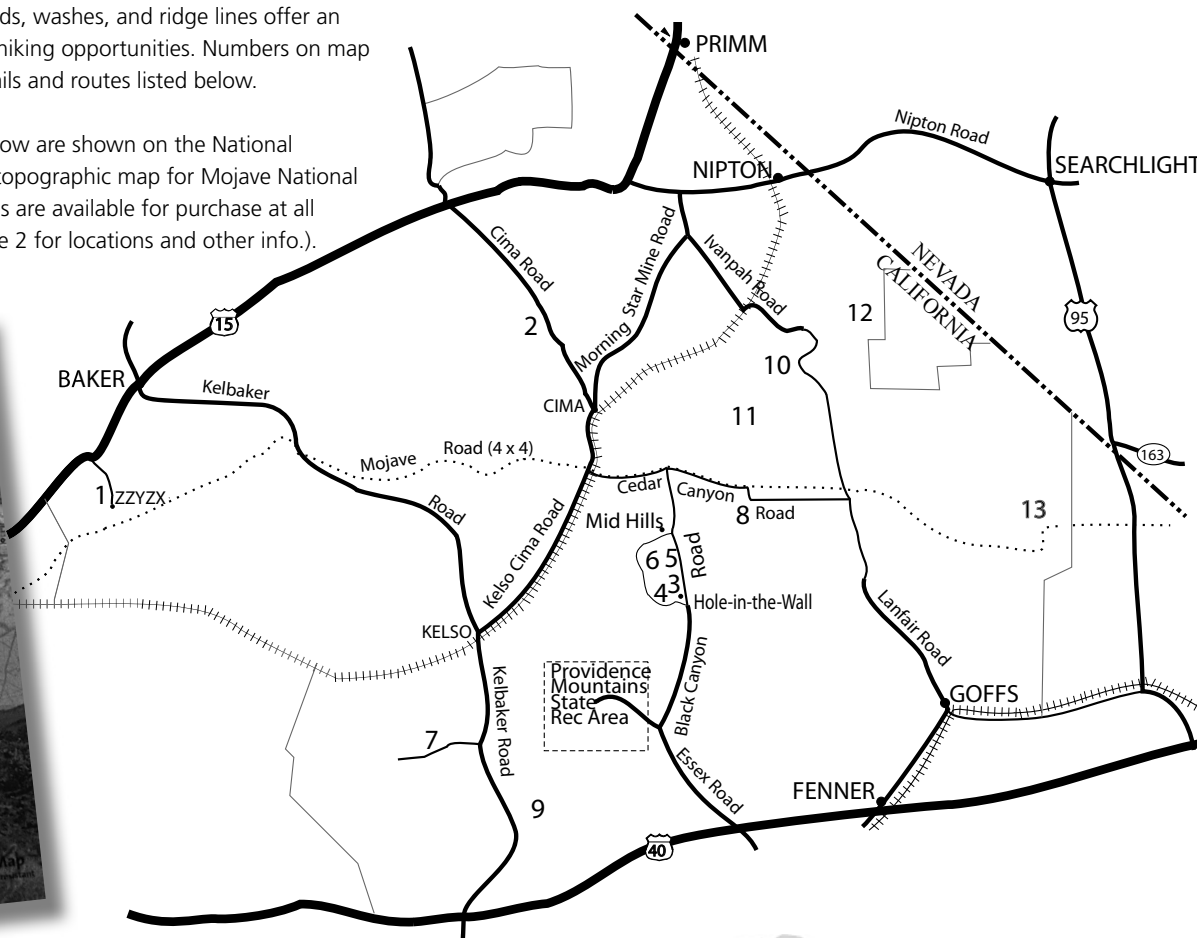
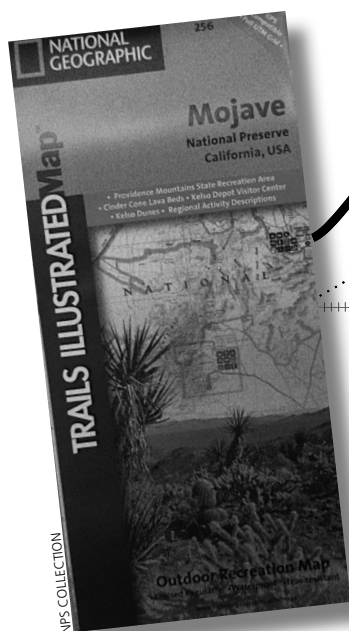


NPS COLLECTION

# Hiking

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 along the trail reveal the rich cultural and natural history of this oasis on the preserve's western boundary.

### 2) Teutonia Peak Trail

Trailhead: 12 miles south of I-15, or 5 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. 3 miles round-trip.

### 3) Hole-in-the-Wall Nature Trail

Trailhead: 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. Trailheads at Hole-in-the-Wall Information Center and Campground.

### 4) 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 1 mile round-trip hike connects to the Mid Hills to Hole-in-the-Wall Trail and Barber Peak Loop Trail (see below).

### 5) Mid Hills to Hole-in-the-Wall Trail

Trailheads: Across the road from the entrance to Mid Hills Campground, and about 2 miles west of Black Canyon Road on the south end of Wild Horse Canyon Road. Hike 8 miles, one-way, through a maze of washes decorated with barrel and cholla cacti, then through the Hackberry Fire burned area. Total elevation gain from south to north is 1,200 feet. Watch carefully for trail route markers.

### 6) Barber Peak Loop Trail

Trailhead: Hole-in-the-Wall Picnic Area, beyond Hole-in-the-Wall Information Center. The preserve's newest trail, 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.

### 7) Kelso Dunes

Start: 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.

### 8) Rock Spring Loop Trail

The 1 mile loop trail starts at the Rock House and leads to a well-known watering hole and site of an 1860s military outpost. Trail starts at Rock House, 5 miles east of Black Canyon Road on Cedar Canyon Road.

## Recommended Routes

**Warning: the routes described below are not established trails; trailheads might be unidentifiable or nonexistent. Check a detailed map or guidebook—available at all information centers—and consult a park ranger for route information.**

### 9) Quail Basin

Start: 12.5 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 and 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 Caruthers Canyon, 5.5 miles west of Ivanpah Road on New York Mountains Road, then 2.7 miles north on unsigned road. **Four-wheel drive recommended.** Hike on an abandoned road through a rocky basin. Mine shafts and abandoned structures are on private property. Do not enter or climb on them as they are unstable and dangerous.

### 12) Castle Peaks Corridor

Start: 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. **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 and 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.

## Repairs are underway at Mitchell Caverns

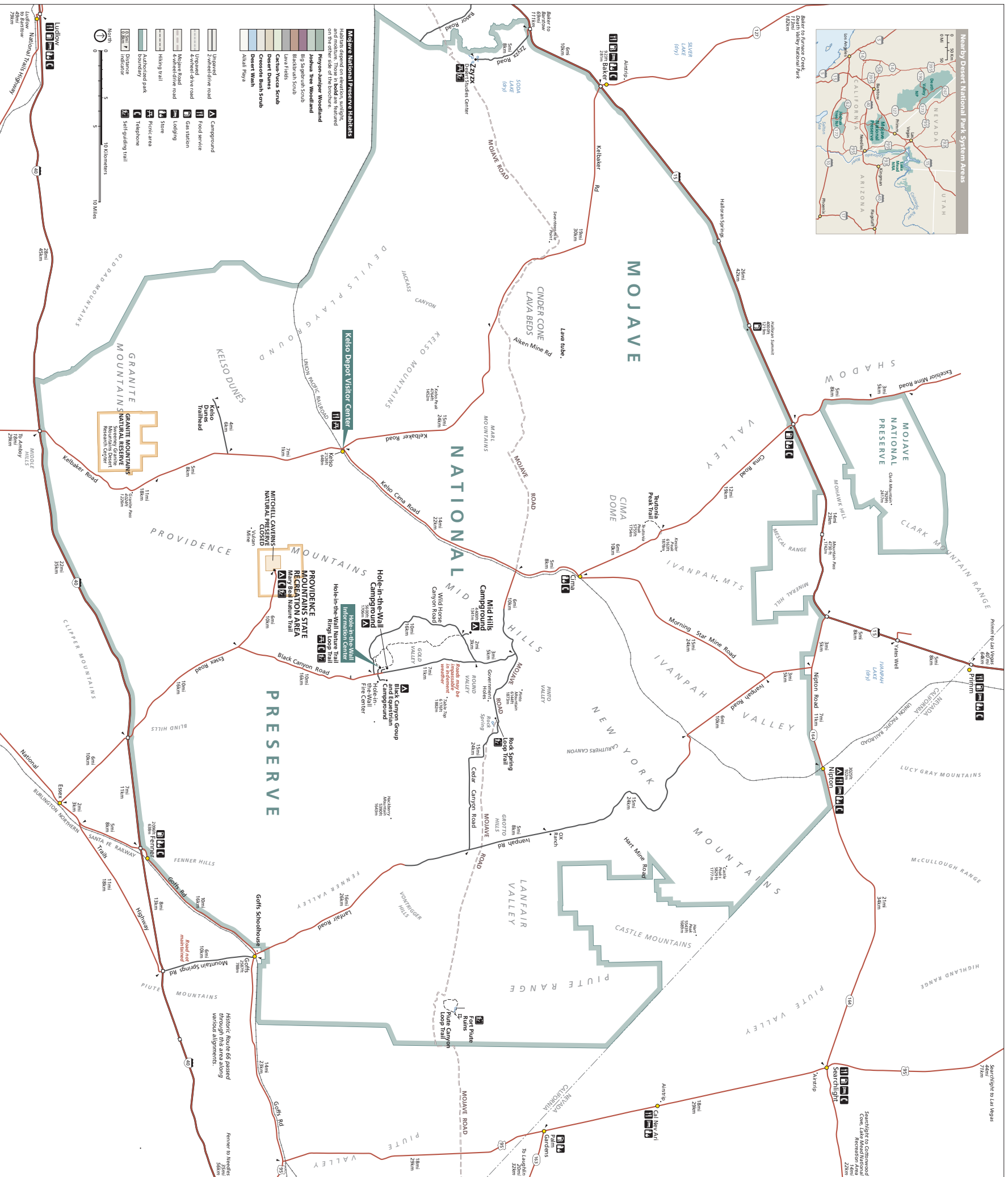
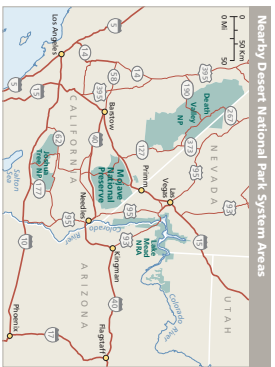
Providence Mountains State Recreation Area, home to Mitchell Caverns, is a California State Park located within the boundaries of Mojave National Preserve. State park officials shut down operations there in January 2011. Employee retirements coincided with the development of serious problems with the water system, and state officials decided to close the park until the system could be repaired.

Meanwhile, shortfalls in the California state budget led lawmakers in Sacramento to ask that state agencies identify possible budget cuts. In May 2011, California State Parks released a closure list, and Providence Mountains was among the 70 parks included. While other parks targeted for the closure were able to remain open with support from non-profit organizations, California State Parks officials decided not to invest in repairs to Providence Mountains State Recreation Area's infrastructure during a time of shrinking budgets, so the park remained closed.

Mitchell Caverns was initially developed as a privately operated tourist attraction by Jack and Ida Mitchell in the early 1930s. Jack Mitchell died in 1954, and his family turned the property over to the state. Providence Mountains State Recreation Area was added to the California State Park system in 1956.

Over the years, California State Parks has made many improvements to the caverns, including the development of a safe pathway through the caverns, a tunnel connecting the two principal caves, and installation of a lighting system. However, the remote location of the caverns and the lack of a connection to the electrical grid have contributed to the difficulties in the operation and maintenance of the caverns.

The state budget has stabilized over the past year, and work has begun to repair and renovate housing, the visitor center, and electrical and water systems. With new investment in this unique and remote holding of the California State Park system, officials hope to reopen Mitchell Caverns for tours in 2014.



**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  
Kelso Depot Visitor Center 760-252-6108  
The Beanery @ 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

**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](http://www.nps.gov/moja)  
Death Valley National Park [www.nps.gov/deva](http://www.nps.gov/deva)  
Joshua Tree National Park [www.nps.gov/jotr](http://www.nps.gov/jotr)  
Lake Mead National Recreation Area [www.nps.gov/lame](http://www.nps.gov/lame)

Providence Mountains State Recreation Area [http://www.parks.ca.gov/?page\\_id=615](http://www.parks.ca.gov/?page_id=615)  
Western National Parks Association (book-store) <http://biology.fullerton.edu/dsc/>  
CSU Desert Studies Center (Zzyzx) [www.blm.gov](http://www.blm.gov)  
Bureau of Land Management <http://nrs.ucop.edu/sweeney-Granite.htm>  
Sweeney Granite Mtns. Desert Research Ctr. [www.desertusa.com/wildflow/wildupdates](http://www.desertusa.com/wildflow/wildupdates)  
DesertUSA wildflower reports [www.deserttoroise.gov](http://www.deserttoroise.gov)  
Desert Tortoise data and information [www.discoverytrails.org/welcome.1.html](http://www.discoverytrails.org/welcome.1.html)  
Desert Discovery Center [www.wilderness.net](http://www.wilderness.net)  
Wilderness information [www.californiadesert.gov](http://www.californiadesert.gov)  
California Desert [www.lnt.org](http://www.lnt.org)  
Leave No Trace [www.usajobs.opm.gov](http://www.usajobs.opm.gov)  
US Federal government jobs



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