Half the Park Is After Dark

The night sky is a glittering dome peppered with stars, planets, and passing meteors—but most people no longer get to see it. In urban and suburban settings, artificial lighting and atmospheric pollutants wash out the light of the stars. This is a serious loss. For millennia, our ancestors experienced a dark night sky. Cultures around the world told stories about the constellations and used the stars as a calendar. Only for the past few generations have humans been denied the chance to stand in awe of the heavens.

Boasting some of the darkest nights in Southern California, Joshua Tree National Park offers many visitors the chance to admire the Milky Way for the first time in their lives. In The Deserts of the Southwest, Peggy and Lane Larson describe how the desert environment naturally provides for exceptional views: “Sky contributes to the desert expanse. Little obstructs the extensive view of the sky dome, which in the clear, arid atmosphere appears bluer by day and more brightly star-studded by night than do the skies over many moister regions.”

Increases in both light and air pollution pose a threat to night sky viewing in Joshua Tree National Park. Data collected by the Earth Observation Group and NOAA National Geophysical Data Center document medium to high levels of light pollution that infringe on the night skies of Joshua Tree National Park. Most of the light pollution comes from poorly regulated artificial lighting in Los Angeles, Las Vegas, and the Coachella Valley. Luke Sabala, Chief Physical Scientist at Joshua Tree National Park, and Stacy Manson, Physical Science Technician, have been collecting data to document light pollution within the park.

“Collecting information on light pollution is important because stargazing is such a popular visitor activity. Joshua Tree is in the process of applying to become recognized as an International Dark Sky Place, and a measurement of sky quality is crucial in receiving designation,” says Manson. Ongoing research also provides the information needed to educate the community on the dramatic amounts of light pollution within the Southern California region. Joshua Tree National Park is committed to the protection and preservation of the desert ecosystem, and a dark night sky is a core part of the desert experience.

Night sky preservation is unique in that the resource cannot be lost permanently. Even in the face of new development approaching the park boundary, the loss of night sky views is both reversible and preventable. An obscured night sky is only temporary. Communities and concerned citizens can prevent and even reverse light pollution by insisting on night-sky friendly light fixtures.

Experience the dark night sky firsthand to gain an understanding of what so many of our forebears cherished. See the Night Sky Almanac on p. 10 for ideas.

Welcome to your park!

The fall is my favorite time to get out and explore Joshua Tree. The temperatures are ideal for hiking, the animals are visible in daylight hours, and the nighttime temperatures are perfect for camping. As the nights start to get longer, it’s also a great time for some night sky viewing.

Joshua Tree is home to some of the darkest skies in the United States and is one of the best locations in the southland to see the Milky Way. On October 16-18, join us for the Joshua Tree National Park Night Sky Festival, where we dedicate three whole days to the magic of the night skies. Or join a ranger for a scheduled full moon hike. Stop by a visitor center to learn more.

Cooler temperatures and seasonal rains are also responsible for a sudden onslaught of wildflowers. Take time for a hike down a desert wash and look for blooming desert wildflowers. Take time for a hike down a desert wash and look for blooming desert wildflowers. You are also likely to see yellow bladderpod and the white, trumpet-shaped flowers of sacred datura.

On behalf of all our park staff, let me thank you for the opportunity to help you explore your parks. Please don’t hesitate to reach out to any one of us to let us know if there is something we can do to help better protect Joshua Tree for future visitors.

Sincerely,

David Smith
Superintendent

Historic Preservation at Mastodon Mine

Ever wondered what historic preservation professionals do, and why their work is important? The National Park Service applies four distinct approaches to the treatment of historic properties: reconstruction, rehabilitation, restoration, and preservation. Park Ranger Lacy Ditto reports from the field about the preservation aspect on p. 8.

Save Water: Live Like a Desert Native

Did you know California is going through a period of historic drought? There is no life without water, but desert plants are adapted to its scarcity. Native plants can teach all of us about being water-wise. Kathleen Radich of the Joshua Basin Water District offers some helpful suggestions on how you, as park visitors, can help conserve water. See p. 11.

Safety; Rules & Regulations ... p. 2
What to See and Do; Leave No Trace ... p. 3
Hiking Trails ... p. 4
Camping; Equestrian Use ... p. 5
Park Map; Essential Information ... p. 6
Weather; Visitor Center Hours ... p. 7
Geology; Significance of Joshua Tree ... p. 9
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by GeoCorps Astronomy Intern Caila Campbell
We want your trip to Joshua Tree to be safe and enjoyable. Ultimately, you are responsible for your own safety. This information will help you prepare.

**Safest Way to Go**

**Diving and swimming**

Water is available only at the city of Joshua Tree and the edges of the park:
- Oasis Visitor Center in Desert Garden
- Black Rock Campground
- Cottonwood Campground
- Watchman Campground (no running water)
- Indian Cove Ranger Station (no RV water access)

**Stay hydrated & eat salty snacks**

You recommend drinking at least 2 liters of water per person, per day. You may experience thirst if you are active, hiking, cycling, or climbing. You may also experience thirst when you are active, even in winter. Replace these fluids and electrolytes by drinking water or sports drinks and consuming salty foods.

**Prepare for changing weather**

Prepare for changing weather by bringing layers. Hiking in early October may hit 90°F (32°C), while winter lows can plunge into freezing temperatures (below 32°F, 0°C). Separating your trip is hazardous even when the air temperature is above freezing. Always have extra layers with you.

**Cell phones are unreliable**

Most of Joshua Tree National Park is remote wilderness and there is no cell coverage. Do not count on your mobile phone for navigation or in case of emergency.

**Giving wildlife a break**

Park roads are narrow and winding, and some areas are often congested. The maximum speed in the park is 45 mph (73 kph), and in many locations the speed limit is reduced to 25 mph (40 kph). Do not drive fast or aggressively. Slow down and roll up windows. Avoid using bright lights. Keep headlights on low beam. Follow posted speed limits. Observe the maximum speed in the park, which may be as low as 15 mph (24 kph) in some areas.

**Don’t trust GPS for driving directions**

In the desert, some GPS units or navigation apps may try to direct you to roads that are unsafe for your vehicle. For safety, refer to the park map for instructions and directions. Always carry a map. Use a flashlight or headlight at night. Campers, shoes your hooks and bindings for critical use. Consuming human food is unhealthy for wildlife and may encourage aggressive behaviors and expose them to danger.

**Never feed any wild animals**

If you are in an area with cell service by dressing in layers. Highs in winter lows can plunge into 32°F, 0°C. While winter lows can plunge into freezing temperatures (below 32°F, 0°C). The maximum speed in the park is 45 mph (73 kph), and in many locations the speed limit is reduced to 25 mph (40 kph). Do not drive fast or aggressively. Slow down and roll up windows. Avoid using bright lights. Keep headlights on low beam. Follow posted speed limits. Observe the maximum speed in the park, which may be as low as 15 mph (24 kph) in some areas.

**Backcountry Roads**

- **Coachella Valley Road**
  - If you have more than one day:
    - Spend the night in one of our campgrounds. If you have the right gear, experience, and fitness level, consider an overnight backcountry trip.
  - **Camping sites**
    - **Bighorn Sheep Campground**: 9 mi (21.7 km) total. Usually passable to all vehicles, this network of dirt roads crosses a valley of boulder piles and Joshua trees. The Queentown dirt roads are popular with cyclists and dirt road users.
  - **Queentown Flats Road**
    - **Backcountry use**: 20 mi (32.4 km) one way. Usable by dirt road vehicles; not recommended for vehicles larger than 11’ (3.4 m) wide or larger than 8’ (2.4 m) high. No large vehicles permitted. This route starts at a trailhead located 1 mi (1.6 km) west of the Cuyamaca Valley Ranger Station.

**Be prepared for unanticipated weather conditions**

Traveling responsibly with your pet

Pets are allowed in the park, but their activities are restricted. Pets must be on a leash no longer than 6 feet (1.8 m) in length. Pets are not allowed in Joshua Tree National Park.

No drones or remote controlled vehicles

Recreational drones, including model airplanes, are prohibited in Joshua Tree National Park. Drones and other remotely operated craft can disturb wildlife and disrupt the visitor experience.

**Campfires**

Campfires are allowed only in designated fire rings or grills that are found in park campgrounds and picnic areas. Campfires are not allowed in backcountry. Bring your own firewood and extra source toQuake your campfire. Do not park on vegetation, living or dead.

**Rules and Regulations**

**Watching wildlife respectively**

We recommend staying at least 25 yards (23 m) from wildlife. If an animal visits you, stop, turn off your engine, and make yourself as large and noisy as possible. Never feed any wild animals.

**Never feed any wild animals**

Consuming human food is unhealthy for wildlife and may encourage aggressive behaviors, and exposes them to danger.

**Never feed any wild animals**

If you have more than one day:

- Drive between the West Entrance and North Entrance to experience some of our famous Joshua trees and boulders.
- Drive to Keys View for a lovely view of the Coachella Valley. On days with little haze in the air, you may be able to see beyond the shining Salton Sea to Sean Island in Mexico.
- Enjoy your winter stay in the Coachella Valley or choose another route.
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- Enjoy your winter stay in the Coachella Valley or choose another route.

**Stay out, stay safe**

Many old mine sites exist within the park. If you choose to visit them, use extreme caution, appreciating them from a safe distance. Never enter mine tunnels, shafts, or fenced areas.

**When in doubt, check with a park ranger**

If you are lost or need assistance, call 911. Wildlife biologists are available to discuss fire rings or grills that are found in park campgrounds and picnic areas. Campfires are not allowed in backcountry. Bring your own firewood and extra source toQuake your campfire. Do not park on vegetation, living or dead.
**Leave information about your planned route and expected time.** There is no guarantee of safety in a national park. Carefully review the safety information and regulations on the park website.

**Group Camping**

Group camping is available at three locations in Joshua Tree National Park:

- **Cottonwood Group Campground**, elevation 5,000 ft (1,524 m). 16 sites. Open all year. $15/night. Water, flush toilets, and hand washing facilities at each site. No water source. No reservations. For more information, call 760-367-5545.

- **Black Rock Group Campground**, elevation 4,000 ft (1,219 m). 20 sites. Open all year. $15/night. No water. For reservations, call 760-367-5545.

- **Ryan Ranch Campground**, elevation 5,500 ft (1,676 m). 5 sites. Open all year. $15/night. No water. For reservations, call 760-367-5545.

**Equestrian Use**

Horseback riding is a popular way to experience the park. The Backcountry and Wilderness Management Plan provides for more than 200 miles of equestrian trails and trail corridors that traverse open plains, canyon bottoms, and dry washes. Many riding trails are already open, clearly marked, and ready to be enjoyed. Other trails are in various stages of development. Trail maps for the West Entrance area and for the Black Rock Canyon area are available.

**Backcountry Camping**

Joshua Tree National Park is vast, and the trail system is accessible by road. An overnight trip into the backcountry is a memorable experience that allows hikers and horseback riders to experience solitude and immersion in wild nature. Adequate preparation is key to enjoying the desert safely.

**Bring Water**

Water sources in the desert are scarce and are reserved for wildlife. You must carry with you a supply of water equivalent to drinking, cooking, and hygiene. The average daily water need is two quarts per person per day. Drink water throughout the day in order to help prevent dehydration.

**Register**

To camp overnight in the backcountry, you must first register for a free permit at backcountry. If you cannot register for a free permit, you may purchase one at the park's backcountry desk, or at the park's website. If available, a vehicle permit is required for those who wish to make their own way through the backcountry. The vehicle must be parked at one of the permitted vehicle parking areas.

**Setting Up Camp**

Your backcountry camp must be located at least one mile (1.6 km) from the road and 500 feet (152 m) from any trail. Avoid camping in washes, sudden storms may lead to flooding. No camping is allowed in rock shelters, caves, or any other area. If you are responsible for checking out the location of any area you are using, which are indicated on the maps at backcountry.2

**Leave No Trace**

If you plan to cook or heat food, bring a camp stove and fuel. No fires are allowed in the backcountry. Parks and trailheads in the park are provided with fire rings. Use these fire rings to keep your fire contained.

**Wilderness**

Almost 30% of Joshua Tree’s 720,510 acres are managed as wilderness. The Joshua Tree Wilderness was established on June 5, 1986, and is located in “an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain.” Wilderness is the highest level of conservation protection for federally-managed public lands. No mechanized transport is allowed in wilderness.

Help us preserve the wilderness character of Joshua Tree for future generations. Review the Leave No Trace principles on p. 3 as you prepare for your trip, then put them into practice.
Joshua Tree National Park is located in Southern California, about 140 miles east of Los Angeles, 170 miles north of San Diego, and 175 miles southwest of San Diego. The park is always open; visitors may come and go at any time. However, several areas are designated for day use only. There is no public transportation to the park. The park is about 140 miles east of Los Angeles, 175 miles north of San Diego, and 175 miles southwest of San Diego. The closest commercial airport is in Palm Springs.

Entrance Fees
$20 day use only.

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Historic Preservation at Mastodon Mine

The Mastodon mining site, located not far from the Cottonwood Visitor Center, comprises 8 identified historic features including a sloped office building, mine adit, and the only standing feature—the ore bin. Park cultural resource managers worked with Cornerstones Community Partnerships, a non-profit historic preservation organization, to preserve the historic structures at Mastodon Mine and help future generations of visitors appreciate the decaying mining site.

The goals of the project were preservation of the ore bin, the replacement of the ore-crushing ball mill to its historic location, and the stabilization of a retaining wall. Presentation of historical and cultural information exists about this moderately preserved gold mine that was operated by the Hesley family between 1923 and 1925. With several historic photos of the Mastodon Mine site to guide them, the crew worked for one week to bring it back to life.

Every piece of splintered wood and each rusty artifact found near the site is carefully catalogued and meticulously reassembled to maintain the historical integrity of the site.

To preserve a historic structure is to preserve and maintain the historical integrity of the site. By preserving a cultural resource for future generations we maintain a stronger connection with our shared heritage. If you visit the Mastodon Mine site please enjoy but stay back. The current preservation effort still has one more phase of work to go. You will see some temporary wood bracing as part of the stabilization and preservation work. Maintaining these mining structures in a state of “arrested decay” means that stabilization and preservation efforts are never complete, but are part of the ongoing management of cultural heritage resources in the park.

By Park Ranger Lacy Ditto

Collections Corner

A location notice logically describes the boundaries of a mining claim. One shown below is for one of Joshua Tree’s most well-known historic mines, the Desert Queen Mine. Location notices are generally folded and placed in a container, which is then tucked into the center of a stack of stone markers. The discovery marker and location notice—along with the associated stacked stone corner markers—delinicate the miner’s claims. Later owners often represent the only information available about the area and are extremely valuable to document the region’s history, making them important historically.

Like many of the desert’s stories, the tales of the beginning of Desert Queen Mine are conflicting and colorful. A man named James is said to have explored the area around 1890 or ’91. According to a newspaper account the claim was “turned” and James was murdered. Other accounts credit a Native American sharing the location with local cowboys. The Desert Queen Mine operated from 1905 to 1913 – yet was one of the more productive gold mines in the park by Assessor Specialist Melones Spoof wood boards, while I brush years of sand away from the base of the ore bin. Gradually a floor and walls of solid granite were revealed. This rock was hand-carved by gold miners in the 1930s to create the weight of the massive stone ore bin that towered precariously on the edge of the cliff. You can see the scars of their tools, chisled linear patterns, chipped right into the face of the rock.

We were standing where men once stood, sweating where they once sweated, working to preserve the structure they designed and operated to sustain their family. As I gazed towards the distant Salton Sea, under the hot sun of a baking summer day, surrounded by the sounds of humans echoing among the boulders, I felt this bond with these men, with the humans who had come here before us. Cultural resource specialists serve as caretakers of the remains of our past, and follow strict standards for the treatment of historic properties.

That’s me with the pickaxe, hard hat, and dust mask, and no, that’s not what I usually look like. In spring 2015, I was asked to help with a historic structure restoration project at the Mastodon Gold Mine in the southern part of Joshua Tree National Park. Though Joshua Tree National Park is usually visited for its natural beauty, the park also has a rich cultural history that stretches back thousands of years. Within past the last century, miners came to this corner of the desert seeking riches. Historic preservation of structures from this period is one of the park’s critical reasons.

We are all caretakers of our collective past. Please do your part to preserve it for the future.

Joshua Tree’s Boulders

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Joshua Tree’s Boulders

The boulders and rock formations of Joshua Tree National Park define the park landscape. The rocks catch the eye of climbers, photographers, and the many other visitors who come to enjoy the park. Most everyone asks, “What are they?” “Where did they come from?” or “What’s with all the strange shapes?”

Many visitors think the rocks look like piles of sand, but they are actually a kind of granite that is unlike the rock commonly used for countertops. Granites are igneous, meaning they formed when hot, molten fluids within the earth’s crust gradually cooled and hardened. Most granites in the park are a particular type called “monzogranite.” Joshua Tree’s monzogranite solidified beneath the surface of the Earth about 254 million years ago, with the youngest rocks formed over 150 million years ago.

WHERE DO THEY COME FROM? About 250 million years ago—before the dinosaurs came to dominate the planet—the thick North American plate began riding over the thinner Pacific Plate. The water-rich oceanic plate was forced under the North American plate, and Earth’s crust gradually cooled into hard rock. Water at depth, where temperatures are extremely hot, helped to melt the rock into granitic magma. It was hot, liquid, and lightweight, and was able to rise upward along deep-seated cracks in the crust that had been fractured by the fierce crunching of the charging plates.

The liquid granite couldn’t force itself all the way up to the surface, so the granite cooled and formed huge, boulder-sized masses within the ancient rock. Over a long period of time, the great blocks of granitic cooled and hardened.

The ancient rock, called gneiss (pronounced “nice”), began to erode. Over millions of years of wear, the rock has completely vanished from the surface in most of the park. The gneiss, dark in color, does remain exposed on mountain tops. Younger and lighter-colored monzogranites are seen in the valley bottoms.

WHAT’S WITH ALL THE STRANGE SHAPES? In many places in the park, the boulders appear as if some gigantic child plied them up. Some boulders have carved faces, are shaped like animals, or take other fanciful forms. Carvings or the rocks and water are the keys to the appearance of our rocks today.

Horizontal stresses from the collision of tectonic plates created sets of parallel, vertical fractures within the buried rock. Later, rainwater building the rocks upward to form sets of X-shaped cracks standing at angles in the granite. All the fractures were avenues for rainwater to seep downward through the rocks to melt and shape and round the original angular blocks into the varied forms seen today in the park.

During the last Ice Age, the climate was cooler and wetter, rainwater abundant. Much of the water seeped through the long cracks in the rocks to melt and shape and round the original angular blocks into the varied forms seen today in the park.

As the climate warmed and dried, the water stopped seeping, and the fractures were left as the rock’s surface expression. All that is left of the frigid Ice Age are the clefts on the surface today.

Graffiti in a part of the ongoing management of cultural heritage resources in the park. As a historic site, this site is carefully catalogued and treated with minimal use of new materials. It has completely vanished from the surface in most of the park. The gneiss, dark in color, does remain exposed on mountain tops. Younger and lighter-colored monzogranites are seen in the valley bottoms.

by Dar Sparring, Ph.D.
Citizen Science at Work

Joshua trees are icons of the Mojave Desert. These unusual-looking plants are true survivors, living for hundreds of years in one of the most extreme environments in the United States. Like other desert flora and fauna, through the winter, they enter a state of dormancy. When the sun warms the desert, the leaves of the Joshua tree can show up to several inches in length. As the leaves unfurl, the plant is able to conserve water and prepare for a summer of growth.

A male tarantula can travel up to 50 miles while seeking a female. Tarantulas spend most of their time underground, emerging at night to hunt insects and other small animals. The fall mating season is a special time because we get a chance to see those usually shy and solitary creatures. If you’re lucky enough to spot a tarantula on your visit, enjoy it without getting too close. A frightened tarantula may rear up on its hind legs, but it won’t actually attempt to bite. However, the hairs that cover its body can cause skin irritation. Tarantulas can bite, but it’s usually no worse than a bee sting for a human. Just give the spider space, and you’ll both walk away happy.

Be a Junior Ranger

Kids of all ages are invited to participate in Joshua Tree National Park’s Junior Ranger program. Kids can earn a Joshua Tree Junior Ranger badge by completing the official activity book. Stop by any park visitor center or entrance station to pick up one or more. In addition to completing age-appropriate activities in the booklet, kids are asked to attend a ranger-led program such as a patio talk, guided walk, or evening program (see schedule, p. 7). We even offer a special “Story Time with a Ranger” program at Joshua Tree Visitor Center on Saturday afternoons at 2:00.

If attending a ranger program isn’t possible, kids can fulfill this requirement by learning to exhibit as a visitor center or along a trail. The Junior Ranger program is designed for kids ages 4-14, but anyone can do it. (Oh! “kids” should expect to be asked to do more activities!)...
Ranger Programs

Discover Joshua Tree with free guided walks, talks, and evening programs given by park rangers and volunteers. Learn how humans, wildlife, and vegetation have adapted to survive in the desert, and how geologic forces have shaped this arid land.

Programs start promptly at the times noted below, so arrive a few minutes early to allow time for parking. Children under age 16 must be accompanied by an adult.

Programs take place outdoors, but may be canceled or moved inside during inclement weather or if there is a danger of lightning. Please dress in layers to prepare for changing conditions. Wear closed-toe shoes to protect your feet. Carry plenty of water with you. For evening programs, bring extra warm layers and a flashlight.

Find Your Park.

The National Park Service turns 100 on August 25, 2016, and you're invited to take part in the celebration! The centennial will kick off a second century of stewardship of America's national parks and engaging communities through recreation, conservation, and historic preservation programs. Learn more at www.findyourpark.com.