Planning Your Spring Visit

Entrance Fees
The park entrance fee is $15 per vehicle. It is good for seven days. The cost of a Joshua Tree annual pass is $30. If you plan to visit several parks or other federal lands this year, an interagency annual pass is available for $80.

Spring Weather
Spring usually brings warming temperatures during the day, but nights remain quite cool. If the wind picks up, and it oftentimes in spring, most park visitors will want a jacket. Regardless of the temperature, a hat, sunglasses, and sun screen applied liberally are a must—this is the desert after all.

Wildflowers
The spring wildflower season usually begins with the large, cream-colored blooms of the Joshua trees in late February, followed by colorful annuals at the lower elevations around the south boundary of the park. Sometime in March, the bloom will follow rising temperatures into the higher elevations of the park. Cacti usually wait until April and May to produce their blooms.

Ranger Programs
Ranger-guided walks, talks, and evening programs are a good way to increase your appreciation of the plants, animals, and natural and cultural features of Joshua Tree National Park. Weekly schedules are available at entrance stations and visitor centers and are posted on campground bulletin boards. We also post them on our website: www.nps.gov/jotr.

For Kids
Kids, stop at an entrance station or visitor center and pick up a Junior Ranger booklet. Complete the activities inside and return it to a ranger at an entrance station or visitor center. When you’ve finished, you’ll receive a Joshua Tree Junior Ranger badge.

Keys View
This popular destination, perched on the crest of the Little San Bernardino Mountains, provides panoramic views of the Coachella Valley and is well worth the 20-minute drive from Park Boulevard down Keys View Road. The lookout is wheelchair accessible, or take the .2-mile-loop trail up the ridge for especially nice views.

Reptile Watch
Warmer spring temperatures mean that cold-blooded reptiles like lizards, snakes, and tortoises will be emerging from their winter burrows to bask in the sun. Each year a large number are run over on park roads, which tend to be warm places to hang out. Please drive slowly with a watchful eye.

When a female collard lizard is carrying eggs, her white collar patches turn a bright orange. See article on page 12.
accessibility
The nature trails at Bajada, Cap Rock, and the Oasis of Mara are accessible. Keys View is accessible and Site 122 at Jumbo Rocks Campground is wheelchair accessible.

all terrain vehicles
ATVs may not be used in the park.

bicycling
Bicycling is permitted on public roads, both paved and dirt, but not on trails. There are no bicycle paths and many roads are narrow, so ride cautiously.

campfires
Campfires are permitted in campground and in picnic areas where fire grate are provided. Campfires are not allowed in the backcountry. Collecting vegetation, living or dead, is prohibited, so bring firewood.

climate
Days are typically clear with less than 25% cloud cover. Temperatures are most comfortable in the spring and fall, with an average high/low of 85°F and 50°F respectively. Winter brings cooler days, around 60°F, and freezing nights. It occasionally snows at higher elevations. Summers are hot, over—sometimes well over—100°F during the day and not cooling much below 75°F until the early hours of the morning.

commercial filming
When filming or photography involves advertising a product or service, the use of models, sets, props, or the use of a restricted site, a film permit is required.

day-use and restricted areas
Some areas within the park are privately owned; others protect wildlife or historical sites. Entering these areas is prohibited. Day-use areas are set aside to protect sensitive populations of wildlife. They are closed from dusk to dawn.

dehydration
It is easy to become dehydrated in arid desert environments. Even if you only plan to drive through the park, you should have some water with you. If you are going to camp, we recommend one gallon of water per person per day. If you are going to be hiking or biking, it is time to turn back.

drug paraphernalia

environment
Two deserts, two large ecosystems whose characteristics are determined primarily by elevation, come together at Joshua Tree National Park. Below 3,000 feet, the Colorado Desert encompasses the eastern part of the park and features natural gardens of ocotillo and cholla cactus. The higher, moister, and slightly cooler Mojave Desert is the special habitat of the Joshua tree. Joshua tree forests occur in the western half of the park, which also includes some of the most interesting geologic displays found in California’s deserts. In addition, five pan fan palm oases dot the park, indicating those few areas where water occurs naturally and where wildlife abounds.

entrance fees
Admission to the park is $15 per vehicle and is good for seven consecutive days. A Joshua Tree Pass may be purchased for $30 and a Federal Lands Pass, which is good for all federal recreation sites, costs $80. Both are good for 12 months. A Senior Pass may be purchased by any U.S. citizen 62 or older for $10, and it is good for life.

firearms and weapons
Firearms, including fireworks, traps, bows, BB guns, paint-ball guns, and slingshots are not allowed in the park.

food, lodging, services
There are no concessions within the park. However, surrounding communities can fulfill most visitor needs. Contact local chambers of commerce for information. Their contact information is listed on page six of this publication.

food storage
Store food in hard-sided containers or in your vehicle to prevent ravens, coyotes, and other wildlife from eating it.

getting to the park
The park is located about 140 miles east of Los Angeles via I-10. Entrances to the park are located off CA HWY 62 (Twentynine Palms Highway), at the towns of Joshua Tree and Twentynine Palms. A third entrance is located about 25 miles east of Indio off I-10.

horses
Horseback riding is a popular way to experience the park. Because of the special requirements for stock in desert areas, you will want to request the publication on horse use before you come.

international visitors
Park information is available at visitor centers and entrance stations in Dutch, French, German, Italian, Japanese, and Spanish.

keep wildlife wild
Feeding coyotes, squirrels, and other animals weans them from their natural food supplies, causes overpopulation, and turns them into aggressive crea-

tures as they lose their fear of humans. It is also illegal!

leave no trace
During your visit please pick up trash from trails, and campsites. Your actions will inspire other park visitors.

lost & found
Report lost, and turn in found, items at any visitor center or ranger station. Lost articles will be returned if found.

off-road driving
Vehicles, including bicycles, are prohibited off established roads. The desert ecosystem is fragile. Off-road driving and riding creates ruts, upsets delicate drainage patterns, compacts the soil, and leaves visual scars for years. Plants are crushed and uprooted. Wildlife shelters are destroyed, and food and water supplies are altered or obliterated.

overnight parking
There is no overflow parking in the park, at visitor centers, or park headquarters. Unattended vehicles may not be parked outside of campgrounds and backcountry boards between 10 p.m. and 6 a.m.

parking
Park roads, even the paved roads, are narrow, winding, and have soft, sandy shoulders. Accidents occur when visitors stop along the road to admire a view or make a picture. There are many pullouts and parking lots, so wait until you get to one before stopping.

pets
While pets are allowed in the park, their activities are restricted. They must be on a leash at all times and cannot be more than 100 feet from a road, picnic area, or campground; they are prohibited from trails, and they must never be left unattended—not even in a vehicle.

potable water
Water is available at the visitor center in Twentynine Palms, at Black Rock and Cottonwood campgrounds, at the entrance station south of Joshua Tree, and at the Indian Cove ranger station.

rock climbing
Climbers may replace existing unsafe bolts, and new bolts may be placed in non-wilderness areas using the bolting checklist. Bolting in wilderness requires a permit. Bolting checklists and permit applications are available at entrance stations and visitor centers. Climbers may not initiate or terminate a climb in an occupied campsite without permission of the occupants.

stay out and stay alive
Mining was an important activity in this area and numerous mining sites can be found within the park. If you choose to visit them, use extreme caution and do not enter old mine workings.

trash
Our dry desert climate cannot quickly decompose such things as orange peels, apple cores, egg shells, and other picnic remains. Loose paper blows into bushes creating an unsightly mess, and plastic six-pack rings can strangle wildlife. Dispose of your trash in a responsible manner and recycle whatever you can.

vehicle laws
Park roads are narrow and winding. Some areas are congested. Speed limits are there for your safety and well-being. State and federal vehicle laws apply within the park.

visitor activities
Ranger-led programs are offered on the weekends from mid-October through mid-December and from mid-February through May. Schedules are available at visitor centers, at entrance stations, and on campground bulletin boards.

visitor centers
The Oasis Visitor Center is located in Twentynine Palms and is open 8 a.m. to 5 p.m. The Joshua Tree Visitor Center, located in Joshua Tree Village, is also open 8 a.m. to 5 p.m. The Cottonwood Visitor Center serves the southern entrance to the park and is open from 9 a.m. to 5 p.m. and Black Rock Nature Center, located in Black Rock Campground, is open October through May.

wildflowers
Spring blooming periods vary with elevation, temperature, and the amount of moisture in the soil. You can get current information on the park website: www.nps.gov/jotr.

wildlife viewing
It is a thrill to see wild animals in the park, but remember: this is their home and they should not be disturbed. This includes the use of artificial light for viewing them.

world wide web
If you are “connected,” check out the National Park Service publications on the web at www.nps.gov. We are adding more information all the time.

you are responsible
You are responsible for knowing and obeying park rules. Check at visitor centers, at entrance stations, on bulletin boards, and on the park website: www.nps.gov/jotr to find out what they are. When in doubt, ask a ranger.
**A Park Full of Stars**

For more and more people, Joshua Tree National Park has become the place to go to see stars. This had park rangers scratching their heads for a while since the heavens are generally thought to lie outside their jurisdiction. Nonetheless, there’s no denying the fact that the park has a growing reputation as a great place for stargazing.

The increased interest in stargazing has opened an opportunity for park interpreters and scientists to talk about one of the park’s most intractable problems—the growing impacts of air and light pollution. About three-quarters of Joshua Tree National Park is Congressionally Designated Wilderness. Such areas are deemed Class I airsheds under the terms of the Clean Air Act. Class I airsheds are supposed to have essentially pure, pristine air. In fact the air over the park is at times among the dirtiest of any unit in the entire National Park System. Light pollution from ever-growing urban areas as far away as Las Vegas has reduced the number of stars visible in the park even on clear nights from 10,000 down to 2,000 or less.

Air-quality scientists document the amount of air pollution in the park and how it affects the park landscape. Park officials work with regional air-quality specialists to educate them to the problems of air pollution over Joshua Tree and the need for strategies to meet Class I air standards. Other park scientists study the amount of light pollution and work with communities to help develop local ordinances to reduce unnecessary lighting.

Air and light pollution represent some of the most pervasive and difficult environmental challenges for park managers. Solutions will require improved public awareness, acknowledgement that problems exist, persistence by those seeking change, and a commitment by all parties to find and implement solutions. That’s a pretty tall order. Nearly as tall as the night sky.

**Desert Glue**

What has tentacles creeping through the ground around you, resists whipping winter desert winds, has watched the sun rise and fall over hundreds of cloudless days, and is invisible to the untrained eye? Cryptobiotic crusts! Otherwise known as “desert glue,” this layer of biotic organisms “hidden” (crypto-) in the surface of park soils is rarely noticed by even the most active desert hiker.

Living soil crusts are found throughout the world, from the hottest deserts to polar regions. In the desert, these crusts are dominated by cyanobacteria (blue-green algae), but also include lichens, mosses, green algae, microfungi, and bacteria. So what’s the big deal? Crusts play a vital role in desert health. Cyanobacteria in the desert form filaments surrounded by sheaths. With summer or winter rains, these filaments become moist and active, moving through the soils, leaving behind a trail of the sticky sheath material. The sheaths stick to surfaces such as soil particles, forming an intricate webbing of fibers. In this way, loose soil particles are joined together, and otherwise unstable, highly erosion-prone surfaces become resistant to both wind and water erosion. Basically, they hold the place in place!

These sheaths build up in the soil over long periods of time, up to 15 cm deep in some areas. Not only do they protect the soil from blowing away; they also absorb precious rainfall (reducing flash flood runoff) and provide a huge surface area for nutrients to cling to. They contribute nitrogen and organic matter to ecosystems which is critical in deserts where resources are few and far between. Unfortunately, many human activities are incompatible with these fragile crusts. The fibers that offer stability to the soil surface are no match for the boot of a hiker nor the weight of a tire. Crushed crusts contribute less nitrogen and organic matter to the ecosystem; under the best circumstances, a thin veneer may return in five to seven years!

So now what? Well, the best thing we can all do is try not to love our desert to death. Stay on established trails, and keep your vehicle on approved roads within the park. If you must walk through an area thick with crusts (you may see them as lumpy black bumps on the ground), walk in single file to destroy as small an area as possible. The desert will thank you for this in years to come, with bountiful wildflower displays in the crusted areas, as well as with land kept in place and a healthy ecosystem.

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**Phainopepla (fain-o-pep-la)**

**Family** Ptilogonatidae

**Genus** Phainopepla

**Species** nitens

**Description** Males are black, females are grey; prominent crest, red eyes, white wing patches that are visible in flight; 11-inch wingspan; length: 7.5 inches.

**Voice** short, quiet whistle

**Food** fruits, berries, insects

**Life History** native, year-round resident; clutch size: 3 to 5

**Habitat** riparian/wash; fan palm oasis

**Status** fairly common

**Where to look** Oasis of Mara, Cottonwood Spring, Indian Cove

**Notes:** Look for phainopelas near mesquites and acacias that host the desert mistletoe. This bird loves the little red berries and drops the seeds from a nearby perch, planting more mistletoe to be eaten at a later time.

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Joshua Tree has gained international attention as a superb rock-climbing area. Joshua Tree National Park offers visitors endless opportunities for exploration and as fascinating as it is, can be life-threatening for those unfamiliar with its potential dangers. It is essential that you carry water with you—even if you are only driving for less crowded and safer cycling than the paved main roads. A network of roads totaling 13.4 miles (21.7 km), crosses this valley of boulder piles and Joshua trees. A bike trip can begin at Hidden Valley or the dirt road opposite Geology Tour Road. Bike racks have been placed in this area so visitors can lock their bikes and go hiking.

Queen Valley Roads
A network of roads, totaling 13.4 miles (21.7 km), crosses this valley of boulder piles and Joshua trees. A bike trip can begin at Hidden Valley or the dirt road opposite Geology Tour Road. Bike racks have been placed in this area so visitors can lock their bikes and go hiking.

Geology Tour Road
An 18-mile motor tour leads through one of the park's most fascinating landscapes. The road turns south from the paved road two miles (3.2 km) west of Jumbo Rocks Campground. There are 16 stops and it takes approximately two hours to make the round trip. The distance from the junction to Squaw Tank is 5.4 miles (8.8 km) This section is mostly downhill but bumpy and sandy. Starting at Squaw Tank, a 6-mile (9.7 km) circular route explores Pleasant Valley. A descriptive brochure that highlights each stop is available at the beginning of the road.

Covington Flats
The dirt roads in Covington Flats offer access to some of the park's largest Joshua trees, junipers, and pinyon pines. From Covington Flats picnic area via Eureka Peak is 3.8 miles (6.2 km) one-way. The dirt road is steep near the end, but the top offers views of Palm Springs, the surrounding mountains, and the Morongo Basin. Your trip will be 6.5 miles (10.5 km) longer if you ride or drive over to the backcountry board, a starting point for excellent hiking.

What To See And Do
Viewed from the road the desert may appear bleak and drab. Closer examination reveals a fascinating variety of plants and animals and surreal geologic features. Joshua Tree National Park offers visitors endless opportunities for exploration and discovery. Depending on the number of hours you have to spend, your interests and energy, here are some ideas to consider:

IF YOU HAVE FOUR HOURS OR LESS, begin your tour at a park visitor center. Park staff will be happy to provide you with current information about conditions in the park as well as answers to your questions. With limited time you may want to confine your sightseeing to the main park roads. Many pullouts with wayside exhibits dot these roads. A list of nature trails and short walks appears in this publication. Consider experiencing at least one of these walks during a short park visit.

On clear days the vista from Keys View extends beyond Salton Sea to Mexico and is well worth the additional 20-minute drive.

IF YOU PLAN TO SPEND AN ENTIRE DAY, there will be time to walk several nature trails or take a longer hike; several are listed on page 7 of this publication. A ranger-lead program will add enjoyment and understanding to your visit. Check at visitor centers and on campground bulletin boards for listings. Or, call ahead and reserve a spot on the popular Keys Ranch guided walking tour.

Some visitors like to experience the desert from the seat of a mountain bike. The park offers an extensive network of dirt roads that make for less crowded and safer cycling than the paved main roads. A selection of road trips is included in the article titled Backcountry Roads in this publication.

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Backcountry Roads
for mountain bikes and 4-wheel drive vehicles

Mountain bikes and 4-wheel drive vehicles are welcome in the park. For your own safety and for the protection of natural features, stay on established roads. Tire tracks on the open desert can last for years and will spoil the wilderness experience of future hikers.

Paved roads in the park are narrow with soft shoulders. Curves, boulder piles, and Joshua trees restrict the vision of bikers and motorists. The unpaved roads in the park are safer for bikes and offer many opportunities to explore the area. Here is a sampling:

Pinkham Canyon Road
This challenging 20-mile (32.4-km) road begins at Cottonwood Visitor Center, travels along Smoke Tree Wash, and then cuts down Pinkham Canyon. Sections of the road run through soft sand and rocky flood plains. The road connects to a service road next to I-10.

Black Eagle Mine Road
Beginning 6.5 miles (10.5 km) north of Cottonwood Visitor Center, this dead-end dirt road runs along the edge of Pinto Basin, crosses several dry washes, and winds through canyons in the Eagle Mountains. The first nine miles (14.5 km) are within the park boundary. Beyond that point is Bureau of Land Management land and a number of side roads. Several old mines are located near these roads. Use extreme caution when exploring old mines.

Old Dale Road
This 23-mile (37.3 km) road starts at the same point as Black Eagle Mine Road. The first 11 miles (17.8 km), cross Pinto Basin, a flat, sandy dry lake bed. Leaving the basin, the road climbs a steep hill, then crosses the park boundary. A number of side roads veer off toward old mines and residences. The main road leads to CA HWY 62, 15 miles (24.3 km) east of Twenty nine Palms.

Queen Valley Roads
A network of roads totaling 13.4 miles (21.7 km), crosses this valley of boulder piles and Joshua trees. A bike trip can begin at Hidden Valley or the dirt road opposite Geology Tour Road. Bike racks have been placed in this place so visitors can lock their bikes and go hiking.

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Campgrounds

<table>
<thead>
<tr>
<th>Campgrounds</th>
<th>Elevation</th>
<th>Sites</th>
<th>Fee</th>
<th>Group Fee</th>
<th>Horse Camp</th>
<th>Water</th>
<th>Flush Toilets</th>
<th>Chemical Toilets</th>
<th>Tables</th>
<th>Fire Grates</th>
<th>Dump Station</th>
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<td>Belle</td>
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Emergency: dial 909-383-5651

Be an inspiration to others; leave your campsite cleaner than you found it.
The hills behind the campground offer a variety of hiking trails including the Hi-View Nature Trail. The interpretive guide for this trail, available at the nature center, identifies the vegetation along this scenic 1.3-mile walk. For those looking for longer trails, Eureka Peak, Panorama Loop, and Warren Peak take hikers to ridge lines overlooking the often snowy peaks of San Jacinto and San Gorgonio. The trailhead for a 35-mile section of the California Riding and Hiking Trail is located at Black Rock. Backpackers can register at the backcountry board here for overnight wilderness trips.

But you don't have to hike to enjoy the Black Rock Canyon area. Wildlife sightings are frequent in the campground. Visitors often encounter ground squirrels, jackrabbits, and cottontails. Frequent bird sightings include cactus wrens, Gambel's quail, great horned owls, scrub-jays, and roadrunners. A lucky birder might be rewarded with a glimpse of a Scott's oriole, pinyon jay, or LeConte's thrasher. More elusive species such as bobcat, big horn sheep, mountain lions, desert tortoises, and mule deer have all been seen in the area. As the sun sets, listen for the "singing" of coyotes living on the outskirts of the campground.

Please do not feed wild animals in Joshua Tree National Park. People food is unhealthy for them and they could become aggressive and harm you.
### Hiking Trails

<table>
<thead>
<tr>
<th>Trail</th>
<th>Round-trip Distance</th>
<th>Time</th>
<th>Starting Point</th>
<th>Trail Description</th>
</tr>
</thead>
</table>
| Barker Dam | 1.5 miles (2.4 km) | 3-4 hours | Barker Dam parking area | Access to the park from the north entrance or the west entrance. Moderate.
| Capitol Reef | 2 miles (3.2 km) | 1-2 hours | Indian Cove | Scenic trail through the western most edge of the Wonderland of Rocks. Several stands of palm trees, evidence of past fires, and pools of water are found at the oasis. The plants in this area are especially fragile, so walk lightly. Moderately strenuous.
| Indian Cave | 4 miles (6.4 km) | 2-3 days | Oasis Visitor Center, West end of Indian Cove | Several stands of palm trees, evidence of past fires, and pools of water are found at the oasis. The plants in this area are especially fragile, so walk lightly. Moderately strenuous.
| Indian Cove | 1.1 miles (1.8 km) | 1 hour | Oasis Visitor Center | Excellent views of the Eagle Mountains and Salton Sea. Summit elevation: 5461 feet (1664 m). Moderately strenuous.
| Keys View | 3 miles (4.8 km) | 1-2 hours | Keys View | A canyon with numerous palm stands. A side trip to Victory Palms is possible. Several stands of palm trees, evidence of past fires, and pools of water are found at the oasis. The plants in this area are especially fragile, so walk lightly. Moderately strenuous.
| Mastodon Peak | 3 miles (4.8 km) | 3-4 hours | Cottonwood Spring or Cottonwood Campground | A canyon with numerous palm stands. A side trip to Victory Palms is possible. Several stands of palm trees, evidence of past fires, and pools of water are found at the oasis. The plants in this area are especially fragile, so walk lightly. Moderately strenuous.
| Ryan Mountain | 3 miles (4.8 km) | 2-3 hours | Ryan Mountain parking area | A trail leading to a viewpoint. Excellent views of the Eagle Mountains and Salton Sea. Summit elevation: 3321 feet (1012 m). Moderately strenuous.

### Nature Trails

<table>
<thead>
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</tr>
</thead>
</table>
| Arch Rock | 2 miles (3.2 km) | 1-2 hours | White Tank Campground, opposite side of road | Scenic trail through the western most edge of the Wonderland of Rocks. Several stands of palm trees, evidence of past fires, and pools of water are found at the oasis. The plants in this area are especially fragile, so walk lightly. Moderately strenuous.
| Boy Scout Trail | 3 miles (4.8 km) | 2-3 hours | Oasis Visitor Center, West end of Indian Cove | Excellent views of the westernmost part of the park. Moderately strenuous.
| Cottonwood Spring | 1.6 miles (2.6 km) | 1 hour | Cottonwood Spring parking area | A canyon with numerous palm stands. A side trip to Victory Palms is possible. Several stands of palm trees, evidence of past fires, and pools of water are found at the oasis. The plants in this area are especially fragile, so walk lightly. Moderately strenuous.
| Indian Cove | 1.5 miles (2.4 km) | 1-2 hours | Oasis Visitor Center | Excellent views of the westernmost part of the park. Moderately strenuous.
| Keys View | 2 miles (3.2 km) | 1-2 hours | Keys View | A canyon with numerous palm stands. A side trip to Victory Palms is possible. Several stands of palm trees, evidence of past fires, and pools of water are found at the oasis. The plants in this area are especially fragile, so walk lightly. Moderately strenuous.
| Keys Ranch Tour | 2 miles (3.2 km) | 1 hour | Oasis Visitor Center | Excellent views of the westernmost part of the park. Moderately strenuous.
| Keys View | 3 miles (4.8 km) | 1-2 hours | Oasis Visitor Center | Excellent views of the westernmost part of the park. Moderately strenuous.
| Oasis of Mara | 1.5 miles (2.4 km) | 1-2 hours | Oasis Visitor Center | Excellent views of the westernmost part of the park. Moderately strenuous.
| Pinto Basin Road/Park Blvd. | 3 miles (4.8 km) | 2-3 hours | Oasis Visitor Center | Excellent views of the westernmost part of the park. Moderately strenuous.
| Ryan Mountain | 3 miles (4.8 km) | 2-3 hours | Ryan Mountain parking area | Excellent views of the westernmost part of the park. Moderately strenuous.
| Ryan Ranch Tour | 2 miles (3.2 km) | 1-2 hours | Oasis Visitor Center | Excellent views of the westernmost part of the park. Moderately strenuous.

### Ranger Programs

**Keys Ranch tours:**
- **Evening campground talks:**
- **Discovery walks:**
- **Star parties:**
- **And much more!**

Pick up a current schedule at an entrance station or visitor center; or look on campground bulletin boards. We also publish program schedules on our website: www.nps.gov/jotr.
The Desert Fan Palm: A California Native

In an otherwise hot and sparse environment, palm oases are a luxuriant gift of shade and solace. The verdant display requires a constant supply of water so oases often occur along fault lines, where uplifted layers of hard impermeable rock forces underground water to the surface. There are only 158 desert fan palm oases in North America. Five are located in Joshua Tree National Park.

The desert fan palm, Washingtonia filifera, is native to the low hot deserts of Southern California where it can live for 80 to 90 years. Towering up to 75 feet, the desert fan palm is among the tallest of North American palms. It is definitely the heaviest: a mature desert fan palm can weigh as much as three tons. Its distinctive leaves are shaped like a fan and folded like an accordion. They measure up to six feet in length and are nearly as wide. Looking much like “petticoats,” the fan palm’s dead leaves remain attached to its trunk until removed by fire, wind, or flood.

Fire is beneficial for palms and rarely kills an adult. In palms the vascular bundles, those tubs that transport water and nutrients, are scattered throughout the trunk. This arrangement provides insulation from the heat of a fire. In contrast, trees such as oaks have all their vascular tissue in a ring just beneath the bark. Fire does kill young palms, but it also removes competitors and opens up space for palm seeds to germinate. In fact, desert fan palms increase seed production immediately after fires. A healthy palm can produce as many as 350,000 seeds.

People have been attracted to palm oases since prehistoric times. Native Americans ate the palm fruit and used the fronds to build waterproof dwellings. The Cahuillas (pronounced: Ka-ween-yas) periodically set fire to oases in order to increase fruit production and to remove the sharp-edged palm fronds littering the oasis floor. The Cahuillas also planted palm seeds in promising locations.

WHERE IN THE PARK IS COTTONWOOD SPRING?

Cottonwood Spring Oasis, one of the best kept secrets in Joshua Tree National Park, is just seven miles from the southern entrance to the park. The spring, the result of earthquake activity, was used for centuries by the Cahuillas, Indians, who left bedrock mortars and clay pots, or ollas, in the area.

Cottonwood Spring was an important water stop for prospectors, miners, and teamsters traveling from Mecca to mines in the north. Water was necessary for gold processing, so a number of gold mills were located here. The remains of an arrastra, a primitive type of gold mill, can be found near the spring, and concrete ruins mark the sites of two later gold mills in the area. Cottonwood Spring was first mentioned in a gold mine claim filed in 1875, indicating that the trees are native. Fan palms first appear around 1920, perhaps growing from seeds deposited by a bird or coyote.

A number of hikes begin at Cottonwood Spring. A short, easy walk down Cottonwood Wash leads past a second oasis to a dry falls. In wet years, the falls can become a scene of rushing water and red-spotted toads. Bighorn sheep often come up the wash for water in the early hours. An old teamster road drops down past the falls to the lower wash. A short hike leads through palo verde and desert willow trees to the remains of Moorten’s Mill.

The three-mile loop trail to Mastodon Peak offers spectacular views, interesting geology, the Mastodon Mine, and the Winona Mill. Site, And, for those looking for a longer hike—eight miles round trip—and the largest stand of fan palms in the park, the Lost Palms Oasis trail is a sure winner.

But you don’t have to hike to enjoy Cottonwood Spring. This is one of the best birding spots in the park, so bring your binoculars and sit a spell. The campground, which has water and rest rooms, is located one-half mile from Cottonwood Spring via a signed trail; there are also trailheads for the 14-mile front country trails in the campground. To learn more about the plants, animals, and history of this fascinating place, join a ranger-led hike, walk, or campfire program, offered most weekends.

Emergency: dial 909-383-5651

Think Globally. Act Locally

Bring your aluminum and metal cans, glass, and plastic to a campground recycling center.

Share or recycle this Joshua Tree Guide when you have finished reading it.

Participate in recycling in your community.

Water is a necessity. Desert fan palms suck up water using a mass of pencil-wide rootlets so dense that the roots of other plant species cannot penetrate. This mass may extend as far as 20 feet from the trunk in all directions. But water, in the form of flash floods, is also the most common cause of death for desert fan palms living in narrow canyons.

Water also draws animals such as bighorn sheep, Gambel’s quail, and coyotes to palm oases. Coyotes help spread palms by eating palm fruit at one location and depositing the undigested seeds at another. The cool shade of an oasis provides habitat for animals that live nowhere else. After dark, a rush of air may be caused by the passing of a western yellow bat—they only roost in palms. During the day, a flash of yellow-orange might be a hooded oriole preparing to build its woven sack-like nest under the large green leaves of a desert fan palm. The dime-sized holes seen in the trunks of palms are exit holes of the two-inch, blue-black, giant palm-boring beetle, Dinapate wrightii, who lives exclusively in palm oases.

The larvae of the Dinapate beetle spend about five years chewing tunnels within the trunks of desert fan palms. The chewing is so loud that woodpeckers use the noise to locate the larvae. Successful larva pupate within the trunk then chew their way out. Because their rear end is wider than their front end, they exit going backwards to avoid getting stuck. Emerging in June, males and females mate and then die within a few weeks. Eventually these beetles can kill a palm, but they only inhabit older trees. Giant palm-boring beetles keep the palm population young and vibrant. The presence of these beetles is actually a sign of a healthy oasis.

Palm stands straight and tall, looking proud and invincible. But they aren’t. Any place can be overly loved. As you explore these oases of wonder, take care. Use existing paths. Watch out for young palms—seedlings look like thick blades of grass. We do not want the presence of people to be a sign of a declining oasis.
**Rockpiles**

The geologic landscape of Joshua Tree has long fascinated visitors to this desert. How did the rocks take on such fantastic shapes? What forces sculpted them?

Geologists believe the face of our modern landscape was born more than 100 million years ago. Molten liquid, heated by the continuous movement of Earth’s crust, oozed upward and cooled while still below the surface of the overlying rock. These plutonic intrusions are a granitic rock called monzogranite.

The monzogranite developed a system of rectangular joints. One set, oriented roughly horizontally, resulted from the removal, by erosion, of the miles of overlying rock, called gneiss (pronounced “nice”). Another set of joints is oriented vertically, roughly parallel to the contact of the monzogranite with its surrounding rocks. The third set is also vertical, but cuts the second set at high angles. The resulting system of joints tended to develop rectangular blocks. (figure 1)

Good examples of the joint system may be seen at Jumbo Rocks, Wonderland of Rocks, and Split Rock.

As ground water percolated down through the monzogranite’s joint fractures, it began to transform some hard mineral grains along its path into soft clay, while it loosened and freed grains resistant to solution. Rectangular stones slowly weathered to spheres of loose mineral grains. Imagine holding an ice cube under the faucet. The cube rounds away at the corners first, because that is the part most exposed to the force of the water. A similar thing happened here, but over millions of years, on a grand scale, and during a much wetter climate. (figure 2)

After the arrival of the arid climate of recent times, flash floods began washing away the protective ground surface. As they were exposed, the huge eroded boulders settled one on top of another, creating those impressive rock piles we see today. (figure 3)

Visitors also wonder about the “broken terrace walls” laced throughout the boulders. These are naturally occurring formations called dikes. Younger than the surrounding monzogranite, dikes were formed when molten rock was pushed into existing joint fractures. Light-colored dikes formed as a mixture of quartz and potassium minerals cooled in these tight spaces. Suggesting the work of a stonemason, they broke into uniform blocks when they were exposed to the surface.

Of the dynamic processes that erode rock material, water, even in arid environments, is the most important. Wind action is also important, but less so than the action of water.

The processes operating in the arid conditions of the present are only partially responsible for the sculpturing of the rocks. The present landscape is essentially a collection of relic features inherited from earlier times of higher rainfall and lower temperatures.
Surrounded by twisted, spiky trees straight out of a Dr. Seuss book, you might begin to question your map. Where are we anyway? In wonder, the traveler pulls over for a snapshot of this prickly oddity; the naturalist reaches for a botanical guide to explain this vegetation spectacle; and the rock climber shouts "Yowch!" when poked by dagger-like spines on the way to the 5.10 climbing route.

Today we enjoy this yucca for its grotesque appearance, a surprising sight in the landscape of biological interest. The Joshua tree's life cycle begins with the rare germination of a seed, its survival dependent upon well-timed rains. Look for sprouts growing up from within the protective branches of a shrub. Young sprouts may grow several inches in the first five years, and then slow down, averaging one-half inch per year thereafter. The tallest Joshua tree in the park looms a whopping forty feet high, a grand presence in the Queen Valley forest; it is estimated to be about 300 years old! These "trees" do not have growth rings like you would find in an oak or pine. This makes aging difficult, but you can divide the height of a Joshua tree by the average annual growth of one-half inch to get a rough estimate.

The moth collects pollen while laying her eggs inside the flower ovary. As seeds develop and mature, the eggs hatch into larvae, which feed on the seeds. The tree relies on the moth for pollination and the moth relies on the tree for a few seeds for her young—a happy symbiosis. The Joshua tree is also capable of sprouting from roots and branches. Being able to reproduce vegetatively allows a much quicker recovery after damaging floods or fires, which may kill the main tree.

Many birds, mammals, reptiles, and insects depend on the Joshua tree for food and shelter. Keep your eyes open for the yellow and black flash of a Scott's oriole busy making a nest in a yucca's branches. At the base of rocks you may find a wood rat nest built with spiny yucca leaves for protection. As evening falls, the desert night lizard begins poking around under the log of a fallen Joshua tree in search of tasty insects.

You may be at ease with pine or hardwood, or find shade under the domesticated trees in your city park, but in the high desert, Joshua is our tree. It is an important part of the Mojave Desert ecosystem, providing habitat for numerous birds, mammals, insects, and lizards. Joshua tree forests tell a story of survival, resilience, and beauty borne through perseverance. They are the silhouette that reminds those of us who live here that we are home. Like the Lorax we speak for the trees, but often the trees speak to us.
Publications to help you plan a visit to Joshua Tree National Park

The following publications have been selected for their value in planning your trip to Joshua Tree National Park. These items and many more may be ordered by mail, telephone, fax, or on the web at www.joshuatree.org.

Getting to Know Joshua Tree National Park

Road Guide to Joshua Tree National Park, Decker. Guides visitors on a driving tour through the land where the Mojave and Colorado Deserts meet. 48 pages PB $5.95

On Foot in Joshua Tree, Furbush. A comprehensive hiking guide featuring 90 park hikes, 40 photos and illustrations, and 26 maps and reference charts. 173 pages PB $14.95


Joshua Tree The Complete Guide, Kaiser. Filled with invaluable tips, maps, and trail descriptions to help you make the most of your time in Joshua Tree. 207 pages PB $19.99

Joshua Tree Desert Reflections, Trimble. Dazzling photos and lyrical narrative make this book both the perfect introduction to the park and a treasured memento. 40 pages PB $9.95

Cragcam’s Guide to Joshua Tree National Park, Breaks park activities into three easy to use areas: hiking, rock climbing, and camping. DVD $21.95

Recreation Map of Joshua Tree, Harrison. Colorful map of Joshua Tree National Park highlighting points of interest, campgrounds, picnic areas, topographic features, and backcountry roads and trails. $8.95

Trails Illustrated Topographic Map of Joshua Tree National Park. Includes elevations, backcountry camping, hikes, routes, and safety. Waterproof and tearproof. $9.95

Joshua Tree, The Story Behind the Scenery, Vucannon. Full of color photos and fascinating text, the perfect introduction to the park. 48 pages PB $9.95; $10.95 for French or German.

Joshua Tree National Park Geology, Trent and Hazlett. Explores the geology and evolution of the Joshua Tree landscape. Includes sections on plate tectonics, regional geology, and seismic activity. PB $9.95

Explore! Grubbs. A Falcon Guide to exploring the trails and roads of Joshua Tree National Park. Includes a fold-out map; where to camp, hike, bike, and drive; trail descriptions and directions; local hazards and safety precautions. 110 pages PB $15.95

Education to enhance your visit to Joshua Tree National Park

THE DESERT INSTITUTE AT JOSHUA TREE NATIONAL PARK, the education program of the Joshua Tree National Park Association, sponsors one, two, and three day field classes on weekends from September to May. Each class examines a natural or cultural feature of the Mojave Desert and is geared to teachers, volunteer interpreters, park visitors, and others interested in learning about the park and the Mojave Desert. College credit is available through University of California Riverside Extension.

MEMBERS OF THE JOSHUA TREE NATIONAL PARK ASSOCIATION are automatically enrolled in Partners in Nature Education (PINE), which qualifies them to receive a $10 discount on each Desert Institute class, as well as discounts on University of California Riverside Extension outdoor study courses. For information on becoming a Joshua Tree National Park Association member, call 760-367-5535.

A CATALOGUE OF DESERT INSTITUTE CLASSES is available at park visitor centers, or you may call 760-367-5535 and request one by mail. An on-line class catalogue is available on our website: http://www.joshuatree.org.

On the Road in California

California Deserts, Schad. Takes you on a journey through the hottest, driest, lowest, and loveliest places in North America. 103 pages PB $14.95

California Road & Recreation Atlas. Detailed maps include landscape, recreation guides, GPS grids, and freeway exit numbers. 143 pages PB $24.95

The Living Desert, exploring national parks and monuments through natural sounds. CD $15.95.

Life in the Desert

Desert Survival Tips, Tricks, & Skills, Nester. Explains how to deal with emergencies that might arise in a desert environment. Filled with examples, narratives, and illustrations to aid understanding. 70 pages PB $10.95

The Joshua Tree, Cornett. Up-to-date information about this symbol of the Mojave Desert and namesake of our national park. 32 pages PB $6.95

Wildflowers of Joshua Tree National Park. Fifty-eight color photos of blooming wildflowers, shrubs, and cacti taken by park staff provide a handy reference for visitors. $1.50

100 Desert Wildflowers, Bowers. Color photos and easy-to-read text highlight some of the most common wildflowers of the deserts in the southwest corner of America. 56 pages PB $7.95

Shrubs and Trees of the Southwest Desert, Bowers. An easy-to-use guide full of descriptions and line drawings of over 100 desert shrubs and trees. 140 pages PB $14.95

How Indians Used Desert Plants, Cornett. An informative account of the ways early natives used a variety of desert plants for food, tools, building materials, and as an integral part of their daily lives. 62 pages PB $9.95

70 Common Cacti, Fischer. Colorful photographs and easy-to-read descriptions demonstrate the unique beauty of the common cacti of the Southwest. 70 pages PB $7.95

Mojave Desert Wildflowers, Stewart. Presents a condensed view of the nearly 2,000 species of plants known to occur throughout the Mojave Desert region. 210 pages PB $14.95

The Sibley Field Guide to Birds of Western North America, Sibley. An indispensable resource for birders seeking an authoritative and portable guide to the birds of the west. 474 pages PB $19.95

Poisonous Dwellers of the Desert, Dodge. This guide not only enables the reader to identify potentially dangerous species but encourages appreciation of the animals' natural history. 40 pages PB $5.95

Ordering Information

Telephone orders are encouraged to ensure that you are ordering the publications best suited to your needs or order from our website at www.joshuatree.org.

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Lizard Lifestyles

The blue spots on this male side-blotched lizard indicate that he is ready to mate.

Viewing wildlife is often a priority for visitors to national parks. During the daytime, wherever you go in Joshua Tree National Park you are likely to see lizards. In spring, they are especially abundant.

There are 18 species of lizards in Joshua Tree. Some are very common; others are rare. Lizards are such a visible part of the desert environment because reptiles are pre-adapted for making a living in the desert. Two things required by all animals, food and water, are scarce in the desert. Lizards require much less food than a bird or mammal of the same size because of their low metabolism. And during winter, when food is often scarce, most lizards hibernate and require no food. Lizards need less water than birds or mammals because they excrete their metabolic wastes as a solid (uric acid) instead of dissolved in water (urine).

In reality, the various species of desert lizards differ markedly in their times and places of activity. Some are early risers, up at sunrise, but others do not get up until late morning. The desert banded gecko is active only at night. Certain species climb around in the rocks, others spend most of their lives underground or under cover; still others live on the ground surface or among the branches of desert plants. Such spatial and temporal differences enable different species to live in close proximity without competing for the same food resources.

In the desert, there are two general communities of lizards. One lives on the desert flats, the other in rocky areas. There are often two different, but similar species playing the same ecological role in their respective community. Each community has a top predator lizard, one with a big tyrannosaur-type head, long teeth, and powerful jaws. On the desert flats this role is occupied by the long-nosed leopard lizard; in rocky areas the role is played by the Mojave collared lizard.

Each community has a large herbivorous lizard. On the desert flats it is the desert iguana, in the rocky areas it is the chuckwalla. This finely tuned division of resources is common in communities with many species. Even though the lizard communities of North American deserts are simple compared with those of Australia and South Africa, this complex partitioning of resources among finely adapted species is apparent here.

When active, most desert lizards maintain a body temperature that is favorable for metabolism by basking in the sun until they reach about 95° F. It is this practice of basking that makes lizards a conspicuous part of the desert scene. Most desert lizards feed on insects, but our two largest—the chuckwalla and desert iguana—eat mainly flowers and leaves.

Many of the smaller species of lizards have special "break points" in the tail bones. The tail beyond these points can be discarded in an emergency, such as being seized by a predator. They are then able to grow a new tail over the following weeks, although the regenerated tail is usually smaller and plainer than the original.

There are two lizards commonly seen around campgrounds by visitors. The small, 4-inch, California side-blotched lizard is brown in color. It is usually seen on top of small boulders. The side-blotched is common in all parts of the park. The other lizard most often seen is the Great Basin fence lizard. This is a larger species, five to seven inches. It is usually very dark in color: gray, black, or even bluish in spring. It is limited to the higher elevation part of the park where it basks on large rock outcrops, often high above ground level.

For the opportunity to see the largest of our lizards, the western chuckwalla, drive along Pinto Basin Road, slowing where it passes through areas with rocky outcrops. Although they are much less numerous than they were 40 years ago, you might just catch a glimpse of a large (12 inch), heavy-bodied lizard sitting near the very top of an outcrop.

Chuckwallas are wary and can seldom be approached closely. Please don't disturb them. They need to bask in the sun in order to absorb the heat necessary to digest the plants they have consumed.

Western chuckwalla basking on a rock outcrop.

Desert iguana searching for edible plants on the desert flats.

by Dr. Harold De Lisle, herpetologist