



# Arches

Double Arch NPS PHOTO / JACOB W. FRANK

## Major Road Construction

Construction crews will be working on major road construction in 2017 with most work happening March through November.

**Devils Garden Campground will be closed March 1 – November 30, 2017.**

Much of the work will occur at night in order to minimize impacts to visitor daytime travel and access. To maximize visitor and worker safety, **all park roads close nightly at 7 pm during work nights.** All visitors must be out of the park by 7 pm. Roads reopen at 7 am. We expect crews to be working nights Sunday through Thursday. Roads will reopen Friday morning at 7 am, with no closures Friday or Saturday nights.

Some areas may require full road and area closures, such as at Devils Garden, Fiery Furnace, and The Windows. We will reopen trails once construction crews are finished working in those areas.

Expect traffic delays, loose gravel on roadways, and area closures. Please use caution when driving through construction zones.

Work will include

- pulverizing and resurfacing all paved roads;
- removing and replacing the bridge rail at Courthouse Wash bridge;
- formalizing pull-offs;
- conducting drainage work near the entrance station;
- constructing a new entrance lane;
- constructing a roundabout along the entrance lane.

For project information and a schedule, visit [go.nps.gov/archesconstruction](http://go.nps.gov/archesconstruction)

## A Second Century of National Parks

ARCHES NATIONAL PARK WELCOMES A GLOBAL community of over one million visitors each year. They come to experience balanced rocks, towering fins and spires, and the world's largest concentration of natural sandstone arches.

This landscape inspires awe at first glance but those who take the time to look more deeply receive the greatest reward. During your visit, pause and smell the fleeting bloom of a desert flower, feel the twisting trunks of ancient junipers, gaze into potholes teeming with life, or listen for raven-call echoing off the rocks.

The park's 76,519 acres abound with surreal geologic wonders that represent

millions of years of earth's history exposed by the tireless hands of water, ice, and wind. Erosional features that color the land paint rocky portraits of the ancient sand dunes, tidal flats, rivers, and lakes from which they originated. This is a place of enduring life and raw beauty, a window from which to contemplate the past and our shared future.

Arches is one of more than 400 sites managed by the National Park Service. These sites tell America's stories. They are places of triumph, of tragedy, of discovery, and of supreme natural beauty.

In 2016, the National Park Service celebrated its one-hundredth year of

caring for America's great scenic and historic places. Now we look ahead to the next century of national parks and wonder: How will today's visitors shape America's shared future? How will you help protect the nation's treasured landscapes and cultural heritage?

During your visit leave no trace, stay on trails, and respect wildlife. You could also join a ranger program, read park signs, or talk with rangers at the visitor center. When you learn more about parks and care for them, you help secure their legacy for the health of the natural world and for generations of visitors to come.

## Welcome to Arches

Have a safe and enjoyable visit by remembering these rules and advisories.



**Drink water.** Arches National Park is in the high desert, and it is easy to become dehydrated, even in cold temperatures. Plan on drinking at least 1 gallon (4 L) of water per day. You can get water at Arches Visitor Center and Devils Garden.



**Do not rely on cell service at Arches.** You may find service where the La Sal Mountains are visible, but availability will vary by provider.



**Respect nature.** Leave plants, rocks, and artifacts where you see them. Do not feed or disturb animals.



**Stay on the trail.** Cairns (small rock piles) mark routes. Follow them, and don't build your own. If you get lost, stay where you are, and wait for rescue.



**Keep off the arches.** It's prohibited—and dangerous—to climb on any arch or on prominent features like Balanced Rock.



**When thunder roars, go indoors.** There is no safe place outside. Seek shelter in a safe building or vehicle.



**Leave drones at home.** Launching, landing, or operating unmanned aircraft (such as model airplanes, quadcopters, or drones) is prohibited.



**Respect living things.** Stay on trail to protect fragile biological soil crusts and plant and animal habitat.



**Watch your step.** Rocks fall. People fall. Sandstone is slippery when wet or icy. In winter, avoid snow or icy trails.



**Leave the rocks as you see them.** Graffiti—carving, scratching, chalking, or any type of marking—is illegal and unsightly.



**The sun is intense, and shade is minimal in the high desert.** Protect yourself with sunscreen, sunglasses, and a hat.

# Park Information



National Park Service  
U.S. Department of the Interior

## Arches National Park

PO Box 907  
Moab, UT 84532  
**email** archinfo@nps.gov  
**phone** 435-719-2299  
**website** nps.gov/arches

## Arches Visitor Guide Published By

Canyonlands Natural History Association, a not-for-profit organization that assists the National Park Service in its educational, interpretive, and scientific programs. For more information, see page 8.

## Follow @ArchesNPS

Join us to share your park experiences with us and our growing online community:



facebook.com/ArchesNPS



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## Park Fees

Arches National Park charges fees for park entrance, camping, and some permits. Eighty percent of the fees collected at Arches are returned to the park to address priority needs in maintenance, infrastructure, resource management, and visitor services.

Entrance Fees	
Single vehicle (per vehicle)	\$25
Motorcycle (per vehicle)	\$15
Pedestrian/Bicycle (per person)	\$10
Interagency Annual Pass	\$80
Southeast Utah Parks Pass	\$50

Passes for US citizens or permanent residents with disabilities, seniors, and active-duty military personnel are also available. Inquire at the entrance station or visitor center.

Camping Fees	Nightly Fee
Devils Garden	\$25 per site
Juniper Group Site (based on group size of up to 55 people)	\$100-\$250
Canyon Wren Group Site (based on group size of up to 35 people)	\$75-\$160

## HOURS OF OPERATION

The park is open 365 days a year. The visitor center is open daily from 9 am to 4 pm, with extended hours spring through fall. The visitor center is closed December 25.

## FOOD, GAS, AND LODGING

There are no food, gas, or lodging services in the park. The town of Moab, five miles from the park entrance, has a full compliment of restaurants, lodging, grocery stores, gas stations, and other services. For information visit [www.discovermoab.com](http://www.discovermoab.com).

## CAMPING

Devils Garden Campground is closed March 1 - November 30, 2017. Devils Garden Campground is located 18 miles from the park entrance. This is the only campground in the park. For area camping options, ask at the visitor center, or visit [www.discovermoab.com](http://www.discovermoab.com)

## SHARE THE ROAD

Park roads are narrow and winding. Do not stop in the roadway—save sight-seeing for designated viewpoints. Watch for pedestrians and bicycles. Ensure a minimum distance of 3 feet (1 m) when passing.

## EMERGENCIES

If you have an emergency:

- Dial 911 on your phone.
- Contact a park employee.
- Go to the visitor center. If the building is closed, use the pay phones outside the building to call 911.

## TRAVELING WITH PETS

Pets are prohibited on all hiking trails, at overlooks, or anywhere in the backcountry, even if they're in carriers. You may have your pet at Devils Garden Campground and may walk your pet in parking lots and on roads. Pets must be on a leash no longer than six feet at all times. Do not leave pets in vehicles when temperatures are above 65°F (18°C) as they can die of heat exhaustion. There are kennels with boarding services in Moab.

**Service animals** trained to perform specific tasks for a person with a disability are allowed on trails or in the backcountry. Emotional support ("therapy") animals are not considered service animals under the Americans with Disabilities Act.

There are many public lands outside the park where you can take your pet.

- Bureau of Land Management (BLM): 435-259-2100
- Manti-La Sal National Forest: 435-259-7155
- Dead Horse Point State Park: 435-259-2614

Inquire with these public lands for any restrictions.

## ACCESSIBILITY

Visitors with mobility impairments can access:

- visitor center: Ramp and reserved parking.
- restrooms throughout the park.
- Devils Garden Campground site #4H.
- Park Avenue Viewpoint: Paved path, slight slope near end.
- Delicate Arch Viewpoint: Hard surface, level.
- Balanced Rock Viewpoint: Paved surface, level.
- Wolfe Ranch Cabin/Rock Art Panel: Hard surface, level.
- Double Arch: Hard surface with slope.



NPS PHOTO / A. KUHN

# Things to Do

Construction and nighttime road closures will limit some activities, particularly stargazing and photography. Ranger programs may change. See page 1.

## RANGER PROGRAMS

**Guided Walks** Offered most days, spring through fall. Easy or moderate trails up to one mile in length. Check at the visitor center for schedule and location. 45 minutes. **Free.**

**Ranger Talks** Offered most days, spring through fall. Check at the visitor center for schedule and location. 15 minutes. **Free.**

**Fiery Furnace Hikes** Physically demanding hikes that require scrambling up and through narrow cracks and along narrow ledges above drop-offs. Children under 5 are not permitted. Purchase tickets at the visitor center.

## HIKING

There are many options for hiking, ranging from a short stroll to a strenuous multi-hour hike. Check page 4 for a listing of hiking trails.

## FOUR-WHEEL DRIVING

Arches has a limited number of four-wheel-drive roads. ATVs/OHVs are prohibited. Check at the visitor center for current road conditions, especially after recent rain. The Bureau of Land Management (BLM) maintains many popular four-wheel-drive routes outside the park.

## STARGAZING

Many overlooks with open views of the sky offer great stargazing. The farther you are from Moab, the darker the sky will be. Try stargazing at Panorama Point or The Windows. Use a red light to protect your night vision. Help other stargazers by pointing your lights toward the ground.

## CYCLING

Ride bicycles only on roads—not on hiking trails or off-road. Construction on paved roads (see page 1) may make for an unpleasant ride. Roads are narrow; there are no shoulders or bike lanes. There may be large vehicles on the road. Ride single file. Dirt roads are sandy, washboarded, or gravel. The Willow Springs road offers an enjoyable two- to three-hour ride. Most popular biking trails in the area are on Bureau of Land Management (BLM) land.

## CLIMBING AND CANYONEERING

You must know and follow all climbing & canyoneering regulations, route closures, and group size limits. Obtain day-use permits and route information at the kiosk at the visitor center plaza or on the park website. **Climbing of any type is prohibited on all arches and prominent features, including Balanced Rock.** Slacklining is always prohibited. Travel only on designated trails, rock, or sandy washes to protect soil crust. Practice Leave No Trace ethics. Most routes require advanced skills; assess your abilities and risks. Plan ahead, and be prepared for self-rescue.

## PHOTOGRAPHY

Take home great photos of your Arches experience. Here are some tips for where you might capture that magic moment at both sunrise and sunset.

**Early Morning** Moab Fault • The Three Gossips • Sheep Rock • Turret Arch • Double Arch • Cache Valley • Delicate Arch Viewpoint • Wolfe Ranch • Landscape Arch • Double O Arch

**Late Afternoon** Park Avenue • La Sal Mountains Viewpoint • Courthouse Towers • Petrified Dunes • Balanced Rock • Garden of Eden • The Windows • Delicate Arch • Fiery Furnace Viewpoint • Skyline Arch • Tower Arch



NPS PHOTO / N. HERBERT

# The Heart of the Desert

**WATER.** The lack of it defines the desert, and yet, evidence of its influence surrounds you. Water's unequalled power to carve solid rock is responsible for the wondrous arches, towers, and other shapes that ignite your imagination.

Cracks filled with rainwater sustain diverse plant life, like the gnarled juniper tree and razor-sharp yucca. Shallow pools called desert potholes teem with microscopic creatures and mean the difference between life and death for a thirsty bighorn ewe. Eight to ten inches a year is just enough rain for desert-adapted life, but what about park visitors? Is there enough water to share?

Yes. Arches National Park provides water at the visitor center, campground, and Devils Garden trailhead. When you refill your bottle at any faucet in the park, you're getting a clean, local taste of the desert's most precious resource, and conserving other limited resources shared by every creature on Earth.

Water you use comes from deep underground. Two wells reach down through porous sandstone to collect this ancient, naturally filtered source. Underground pipes transport it to sinks, toilets, and drinking faucets throughout the park.

Two specially labeled spigots at the visitor center provide puri-

fied water just for drinking. This water has been treated to remove particles and organic chemicals, making the water extra-soft and good tasting. Please conserve this specially-treated water and do not bathe at these spigots. Also, make sure to turn faucets completely off when you are finished, so that none of this precious resource is wasted.

Wisely choosing how your water is packaged also conserves limited resources. Manufacturing a 16-ounce plastic water bottle uses four times that volume of water. Reusing bottles reduces your imprint today and far into the future.

When you drink park water, a drop of the desert becomes a part of you. It is a way to take Arches home with you, along with your memories, photos, and a little red sand in your shoes.

Responsibly sharing water with the juniper, yucca, pothole creatures, bighorn sheep, and countless future visitors is part of the experience at Arches. So fill your cup, say a word of thanks, and enjoy a refreshing gulp of the heart of the desert.



NPS PHOTO / N. HERBERT

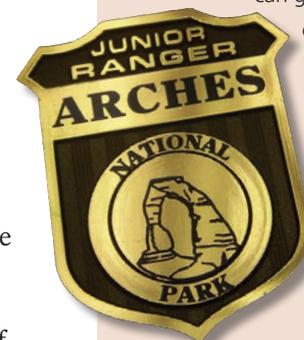


NPS PHOTO / A. KUHN

## Hey Kids— This One's For You!

Do you want to explore Arches and help protect the park? Then become a Junior Ranger! Becoming a Junior Ranger is a serious and important task, but it's lots of fun too. Ask at the visitor center how you can get involved. Options include completing a book-

let or checking out a Red Rock Explorer Pack. It's that simple! You'll earn a badge and certificate and join the ranks of the many Junior Rangers who help protect this special place.



# Share the Scenery

ARCHES NATIONAL PARK contains the world's largest collection of natural stone arches, as well as a treasure trove of fins, bridges, pinnacles, and balanced rocks. Despite this diversity, most visitors flock to the same four destinations: Balanced Rock, Devils Garden, Delicate Arch, and The Windows. Parking lots at these popular areas frequently overflow with cars between March and October.

Arches is popular for a reason. The breathtaking scenery attracts people from around the world. Even during the busy season, you can use these tips to have an enjoyable experience and to help preserve these timeless landscapes for others to enjoy:

- **Start your day early.** Enter the park before 8 am. Sunrise is just as beautiful as sunset.

- **Allow extra time.** There is plenty of scenery for all to enjoy, and the rocks aren't going anywhere—at least, not on a human time scale.
- **Carpool.** Parking is very limited, so consider leaving extra vehicles, large RVs, or trailers at the hotel, campground, or visitor center parking lot.
- **If the park is too busy, visit other parks and public lands nearby.** See page 8 for some options.

### An Extra Note about Parking

Acceptable parking places include individually marked stalls, parking "lanes" along fences, and existing turnouts along the roads. Never park on vegetation or in a manner that blocks traffic, and please don't hold up the flow of cars by waiting for a parking spot. If there isn't room at your chosen destination, move to another area and come back later.



NPS PHOTO / SHEENA HARPER

Roadside parking can be unsafe and damage plants and soils. If you park along the roadside, make sure your vehicle is clear of traffic, but not parked on plants or biological soil crusts.

# Graffiti: A Major Problem

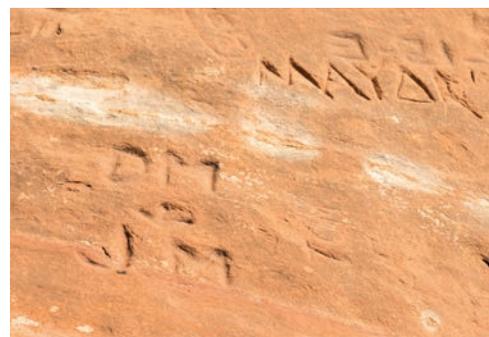
ARCHES NATIONAL PARK is an exceptional park with a very common problem: graffiti. You might be shocked: "Graffiti? In a national park?" Nearly every day, rangers find words or shapes drawn, carved, scratched, or painted on rocks at Arches. Over one million people visit every year, and many may not know that all graffiti in the park is vandalism – no matter how small or superficially drawn.

Yet graffiti keeps appearing throughout the park—under arches, on boulders, atop fins, even across ancient petroglyphs. Removing graffiti takes time, care, and a lot of hard work. Depending on the

type of graffiti, park staff may use brushes and spray bottles, or grinders and sledge hammers to remove it. Even if the graffiti is removed, the rock is still discolored. It will never be the same.

Will you help stop this problem? Instead of carving on the rocks, there are many other ways to mark your journey here: a spectacular photo, an unforgettable hike, a quiet moment of reflection.

We can all do our part to achieve this mission. Help protect Arches National Park by not leaving your mark. Make memories, take photos, and leave no trace.



NPS PHOTOS

Examples of graffiti include chalking, carving, and scratching. Any kind of marking on the rocks is unsightly and illegal, and it takes a significant amount of staff time and effort to remove.

# Plan Your Visit

## DRIVING

### In 1½ hours, you can do either of these two drives:

- Drive to The Windows Section and see some of the park's largest arches.
- Drive to Delicate Arch Viewpoint and see the world's most famous arch from a distance. Stop at Wolfe Ranch on your way back, and imagine homesteading here in the late 1800s.

### In 3 hours:

- Drive the whole park road, spending 10 minutes at each viewpoint.

### In half a day:

- Drive the whole park road, spending 10 minutes at each viewpoint, and take a short walk at The Windows Section, Delicate Arch Viewpoint, or Balanced Rock.

## HIKING

### In two hours, you can do one of these four routes:

- Hike The Windows loop trail. Hike between parking areas to Double Arch. Drive back to Balanced Rock and walk the trail around its base.
- Hike up the sloping slickrock to see Delicate Arch. (Avoid this trail in midday summer heat.)
- Walk between tall fins in Devils Garden to see Landscape Arch, North America's longest.
- Walk to Sand Dune Arch, then across the field to Broken Arch. Continue through the end of the campground and return. Enjoy Tapestry Arch and the sandstone fins.

### In half a day, take one of these three hikes:

- Hike the entire Devils Garden trail to the spire called Dark Angel. On your way back, hike the primitive trail only if you're up for challenging slopes and exposure to heights.
- If you don't mind driving an unpaved road to the remote area called Klondike Bluffs, hike the primitive trail to Tower Arch.

# Hiking

TRAIL	LENGTH	TIME	DESCRIPTION
<b>EASY TRAILS</b>			
<b>Balanced Rock</b>  	0.3 miles roundtrip 0.5 km	15-30 min.	This is a loop trail at the base of a fragile, picturesque rock formation. Part of the trail is paved.
<b>The Windows</b> 	1 mile roundtrip 1.6 km	30-60 min.	A gentle climb up a gravel trail leads to the massive North and South windows, and Turret Arch. Return via the same trail, or take the slightly longer primitive trail around the back of the Windows from South Window viewpoint.
<b>Double Arch</b> <i>at The Windows</i> 	0.5 miles roundtrip 0.8 km	15-30 min.	A relatively flat trail leads to the base of two giant arch spans that are joined at one end.
<b>Delicate Arch Viewpoints</b>  	100 yards roundtrip 91 m	5-15 min.	<i>You can't hike to Delicate Arch on these trails; the hike to Delicate Arch begins at Wolfe Ranch.</i> A flat accessible trail leads to the lower viewpoint. A longer, moderately strenuous trail climbs steeply 0.5 mile (0.8 km) to the upper viewpoint, separated from Delicate Arch by a canyon.
<b>Sand Dune Arch</b>	0.3 miles roundtrip 0.5 km	15-30 min.	Hike through deep sand to a secluded arch tucked among sandstone fins. <i>Do not climb or jump off the arch.</i>
<b>Broken Arch</b>	1.3 miles roundtrip 2.1 km	30-60 min.	The trail crosses a large meadow to the arch. Extend the hike to 2 miles (3.2 km) roundtrip by hiking through the arch, past Tapestry Arch, and through the campground. Part of the longer loop includes some moderate scrambling.
<b>Skyline Arch</b>	0.4 miles roundtrip 0.6 km	10-20 min.	A short, out-and-back hike on a flat, well-defined trail leads to an arch in a high wall.
<b>Landscape Arch</b> <i>at Devils Garden</i>  	1.6 miles roundtrip 2.6 km	30-60 min.	A relatively flat, hard packed trail leads to a spectacular ribbon of rock. The trail past Landscape Arch continues toward Double O Arch, but it becomes difficult, with rock scrambling, narrow ledges, and exposure to heights.
<b>Courthouse Wash Rock Art Panel</b>	1 mile roundtrip 1.6 km	30-60 min.	Park 0.5 miles (0.8 km) north of the Colorado River on the right side of US 191. A short walk across the Courthouse Wash bridge and a brief climb leads to a prehistoric rock art panel (at the base of the cliffs, facing west).
<b>MODERATE TRAILS</b>			
<b>Park Avenue</b>	1 mile one way 1.6 km	30-60 min.	The trail descends steeply into a spectacular canyon and continues to Courthouse Towers. For a roundtrip hike, retrace your steps along the trail rather than walking along the road. Elevation change: 320 feet (98 m)
<b>DIFFICULT TRAILS</b>			
<b>Delicate Arch</b> <i>at Wolfe Ranch</i> 	3 miles roundtrip 4.8 km	2-3 hours	<i>Take at least 2 quarts (2 L) of water per person.</i> This trail has no shade and some exposure to heights. Elevation change 480 feet (146 m). Follow rock cairns on the steep slickrock slope. The trail levels out toward the top of this rock face. Just before you get to Delicate Arch, the trail traverses a rock ledge for about 200 yards (183 m).
<b>Tower Arch</b> <i>at Klondike Bluffs</i> 	3.4 miles roundtrip 5.5 km	2-3 hours	The trail climbs a steep, short rock wall, cuts across a valley, and then meanders through sandstone fins and sand dunes. An alternate, shorter trail (0.3 mile [0.5 km] one way) begins at the end of the four-wheel-drive road on the west side of Tower Arch. This unpaved road washes out quickly in rainstorms; check road conditions before heading out.
<b>Double O Arch</b> <i>at Devils Garden</i>  	4.2 miles roundtrip 6.8 km	2-3 hours	The trail beyond Landscape Arch is a challenge as it climbs over sandstone slabs. Footing is rocky; there are narrow ledges with steep drop-offs. Spur trails lead to more arches. Dark Angel is 0.5 miles (0.8 km) beyond Double O Arch.
<b>Primitive Trail</b> <i>at Devils Garden</i>  	7.2 miles roundtrip 11.6 km	3-5 hours	The Primitive Trail is an alternative route to or from Double O Arch. It involves narrow ledges, uneven surface hiking and scrambling on slickrock. <i>Not recommended when rock is wet or icy, or for those uncomfortable with heights.</i>
<b>Fiery Furnace</b> <i>(Fee Area)</i> 	The Fiery Furnace is a labyrinth of narrow sandstone canyons that requires agility to explore. To enter the Fiery Furnace, you must accompany a ranger-guided hike (see p. 2) or obtain a day-use permit at the visitor center. All parties must be present at the visitor center to obtain a Fiery Furnace permit.		

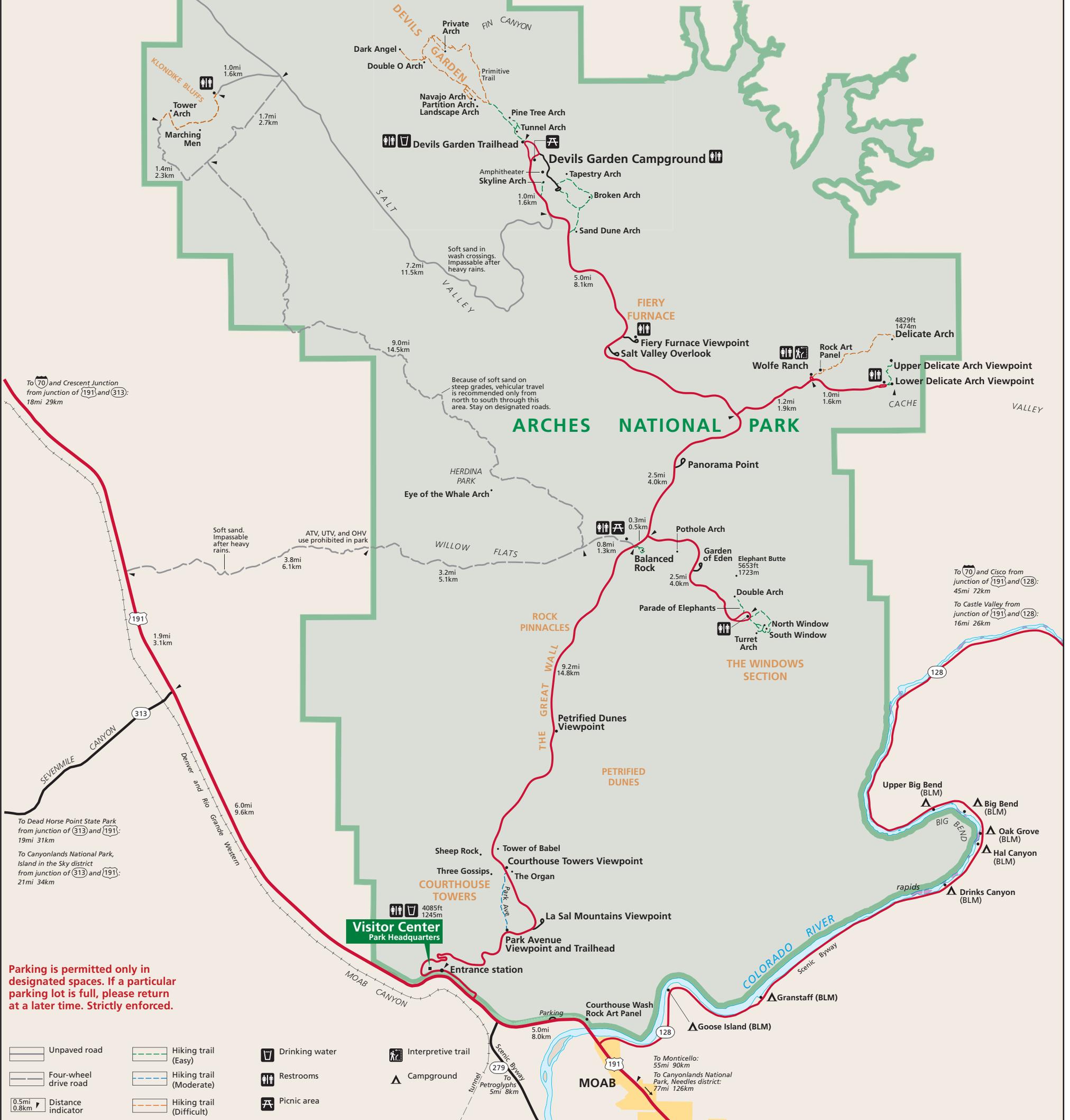
-  Wheelchair-accessible trail
-  Toilet near trailhead
-  Water near trailhead

**Trailhead parking is limited. If parking lots are full, move on and come back later.  
For the best chance of finding a spot, arrive before 9 am or after 3 pm.**



**CAUTION**  
Stay on trails or slickrock to protect fragile biological soil crust. These tiny organisms are critical to all life in the desert.

ATV, UTV, and OHV use prohibited in park



To **70** and Crescent Junction from junction of **191** and **313**: 18mi 29km

Because of soft sand on steep grades, vehicular travel is recommended only from north to south through this area. Stay on designated roads.

Soft sand. Impassable after heavy rains.

ATV, UTV, and OHV use prohibited in park

To **70** and Cisco from junction of **191** and **128**: 45mi 72km

To Castle Valley from junction of **191** and **128**: 16mi 26km

To Dead Horse Point State Park from junction of **313** and **191**: 19mi 31km

To Canyonlands National Park, Island in the Sky district from junction of **313** and **191**: 21mi 34km

**Parking is permitted only in designated spaces. If a particular parking lot is full, please return at a later time. Strictly enforced.**

- Unpaved road
- Four-wheel drive road
- 0.5mi 0.8km Distance indicator

- Hiking trail (Easy)
- Hiking trail (Moderate)
- Hiking trail (Difficult)

- Drinking water
- Restrooms
- Picnic area

- Interpretive trail
- Campground

# Drinking from the Big Dipper

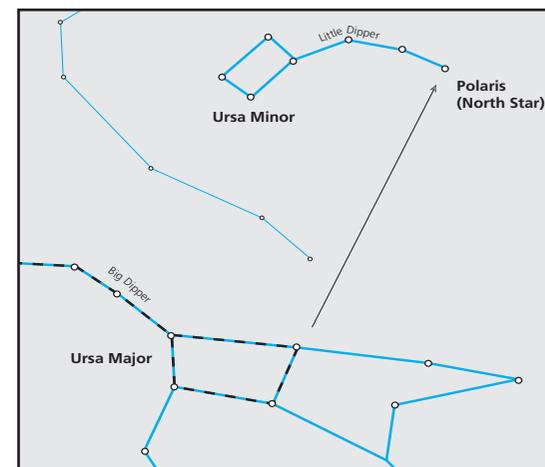
YOU'VE HEARD ABOUT ARCHES NATIONAL PARK'S VELVETY DARK SKIES AND GLITTERING STARRY views, but you're not sure where to start. First, find a dark place away from the lights of Moab. (Arches is open at night too!) Turn off flashlights and car lights for at least 20 minutes to let your eyes adjust to the dark. Then begin with what you know – the Big Dipper. The Big Dipper is part of the constellation Ursa Major or the Great Bear. It has been recognized by humans for more than 2,000 years, guiding travelers and starring in stories of many different cultures.

Groups of stars, including the Big Dipper, guided our ancestors to safety and new opportunities. Use the two stars on the end of the Dipper's cup to point you, like an arrow, to the North Star (see picture). The North Star, called Polaris, stands still while all the other stars appear to rotate around it each night. After you find Polaris, use a planisphere or star chart to discover nearby constellations. Little Dipper (Ursa Minor or the Little Bear), curls toward her mother with Polaris as the tip of her tail.

Throughout human history, reading the stars was a central part of life. Native people planned their most important decisions, such as when to plant and harvest, by the celestial calendar. Star stories told of cultural truths. The Big Dipper has been seen

as a plow, a wagon, a moose, and even a pig's jaw bone by different cultures. Early explorers used their night sky view like a GPS system. African American slaves used the Big Dipper (they called it the Drinking Gourd) as a guiding light on their journey to freedom in the north. A starry night view has always been humanity's guide and companion.

In the modern world, the celestial view still guides us and inspires us, from pop songs to space exploration. As the lights of human development increasingly cross park boundaries, natural darkness needs our protection. Join us in this mission – consider turning off or shielding lights at your home or workplace so that light does not shine up or sideways. Stars are not just for astronomers – they are our human heritage.



## Curious Behavior

BY MICHAEL MATTHES

FROM SOMERSAULTING THROUGH THE AIR TO sliding in the snow, the behavior of the Common Raven (*Corvus corax*) is curious to say the least. These bold, playful passerines are one of the most common wildlife sightings in the park. If you're a "people-watcher" then you may become a "raven-watcher" by the end of your visit; these birds are remarkably like you and me.

Like humans, ravens speak their mind. Their sophisticated avian vocabulary is complex with over 30 types of calls. From the low, croak-like "kraaaaah" to the deep, nasal "brooook," ravens are expressive communicators. Their vocal repertoire includes hunger calls, defense calls, flight calls, alarm calls, whistles, and territorial announcements. These loud-mouthed birds also make non-vocal sounds like wing whistling and bill snapping. The Common Raven can also mimic sounds from their environment including human speech.

Aerial acrobatics, demonstrations of intelligence, and providing food are key behaviors during the courting process. Once paired, ravens nest together for life, usually in the same location. Though not

as social as their close relatives, crows and magpies, they are often spotted with or near their mates.

"Bird brain" isn't an insult when it comes to the raven; they actually have large brains and are extremely intelligent.

Cognitive processes such as imitation, insight, and the superb ability to solve problems truly set them apart from other bird species. Scientists believe that ravens memorize locations of food sources and have observed ravens using sticks as tools to raid other ravens' food caches. We humans are not the only species that relies on retaining and recalling past experience as we soar through life.

Ravens are opportunists and will eat just about anything they can get their claws on. Most of their diet consists of carrion, lizards, bats, insects, and seeds, but they aren't opposed to human food as well. These clever scoundrels have been known to break into unsecured coolers and vehicles for tasty yet unhealthy human treats. In an effort to keep wildlife wild, avoid feeding ravens by keeping your food properly stored in a secure location.

## A Microscopic Community

BIOLOGICAL SOIL CRUST IS A LIVING GROUND-cover that forms the foundation of high desert plant life in Arches and the surrounding area. This knobby, black crust is dominated by cyanobacteria, but also includes lichens, mosses, green algae, microfungi, and bacteria.

Cyanobacteria, previously called blue-green algae, are one of the oldest known life forms. Scientists think that these organisms were among the first land colonizers of Earth's early land masses, and played an integral role in the formation and stabilization of Earth's early soils. Extremely thick mats of these organisms converted the planet's original carbon dioxide-rich atmosphere into one rich in oxygen and capable of sustaining life.

When wet, cyanobacteria move through the soil and bind rock or soil particles, forming an intricate web of fibers. In this way, loose soil particles are joined together, and an otherwise unstable surface becomes very resistant to both wind and water erosion. This soil-binding action does not require living filaments. One can still find layers of abandoned sheaths, built up over long periods of time, clinging tenaciously to soil particles, providing cohesion and stability in sandy soils at depths up to 4 inches (10 cm).

Vascular plants can't utilize nitrogen as it occurs in the atmosphere. Cyanobacteria convert atmospheric nitrogen to a form plants can use. This is especially important in desert ecosystems, where nitrogen levels in the soil are low, which often limits plant productivity. Soil crusts also intercept and store water, nutrients, and organic matter that might otherwise be unavailable to plants.



NPS PHOTO / NEAL HERBERT

Even though these organisms are long-lived, they are also fragile. We can negatively affect the presence and health of soil crusts. Footprints or machinery impacts are extremely harmful, especially when the crusts are dry and brittle. Tracks in continuous strips, such as those produced by vehicles or bicycles, create areas that are highly vulnerable to wind and water erosion. Rainfall carries away loose material, often creating channels along these tracks, especially on slopes.

Impacted areas may never fully recover. Under the best circumstances, a thin veneer of biological soil crust may return in five to seven years. Recovery usually happens slowly during up to 50 years of cyanobacterial growth. Lichens and mosses may take even longer to recover.

Help us protect park soils during your visit. Please walk on trails, rock or in sandy washes (where water flows when it rains), and keep your vehicles and bikes on designated roads.



NPS PHOTO / NEAL HERBERT

# Why So Many Arches?

ARCHES NATIONAL PARK HAS THE DENSEST CONCENTRATION OF NATURAL STONE ARCHES IN THE world. There are over 2,000 documented arches in the park, ranging from sliver-thin cracks to spans greater than 300 feet (97 m). Why are there so many arches in this place? How do they form? And what is an arch, anyway?

## First, you need the right kinds of rock.

Sandstone is made of grains of sand cemented together by minerals, but not all sandstone is the same. The Entrada Sandstone was once a massive desert, full of shifting dunes of fine-grained sand. The grains are rounded so, when packed together, they formed a rock that is very porous (full of tiny spaces).

## Crack it into parallel lines.

Deep beneath the surface lies a thick layer of salts. Squeezed by the tons of rock above it, the salt bulged upward, creating long domes. The rock layers covering these domes were forced to crack, like the surface of freshly-baked bread, into a series of more-or-less parallel lines.

## Next, add the right amount of rain.

On average, the park receives 8-10 inches (18-23 cm) of precipitation a year. That might not sound like much, but it's enough to keep the engines of erosion working 24 hours a day, 365 days a year.

Rainwater soaks into the porous Entrada sandstone easily and then slowly dissolves the calcite bonding the sand together—in other words, rotting the rock from the inside out. Water puddles at the bottom of the Entrada layer, just above a denser rock layer, where it erodes a cavity, like one between your teeth. In winter, water trapped between the layers expands when it freezes and contracts, prying the rock apart.

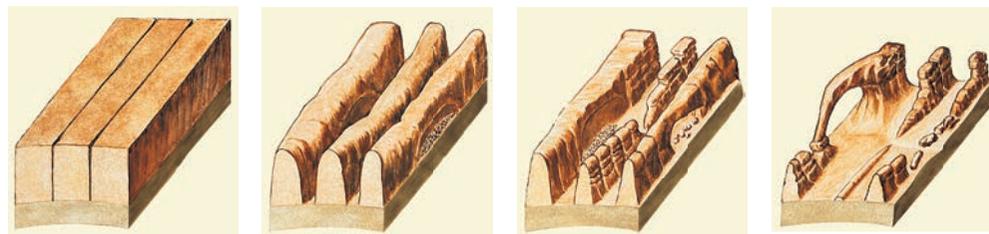
If the park received too much precipitation, the sandstone could erode so quickly that arches might not have time to form. If it never rained here, the engines of erosion would stop.

## Let the water do its work.

As erosion happens, a variety of shapes begin to appear. To be one of the park's official stone arches, a hole must have an opening of at least three feet (1 m) in any one direction. There is no requirement for width; many arches in the park are so skinny you have to place your cheek against the rock to see any light through them.

Is a window a special kind of arch? Not really. "Windows" are arches that are particularly large, are located on a high wall or fin, or "frame" a particularly scenic view beyond.

What about bridges? A natural bridge spans a waterway—or somewhere water once ran. Very few bridges exist at Arches, but Natural Bridges National Monument, just two hours south of here, has three tremendous examples of this feature. All of them are visible from a paved road or by hiking trail.

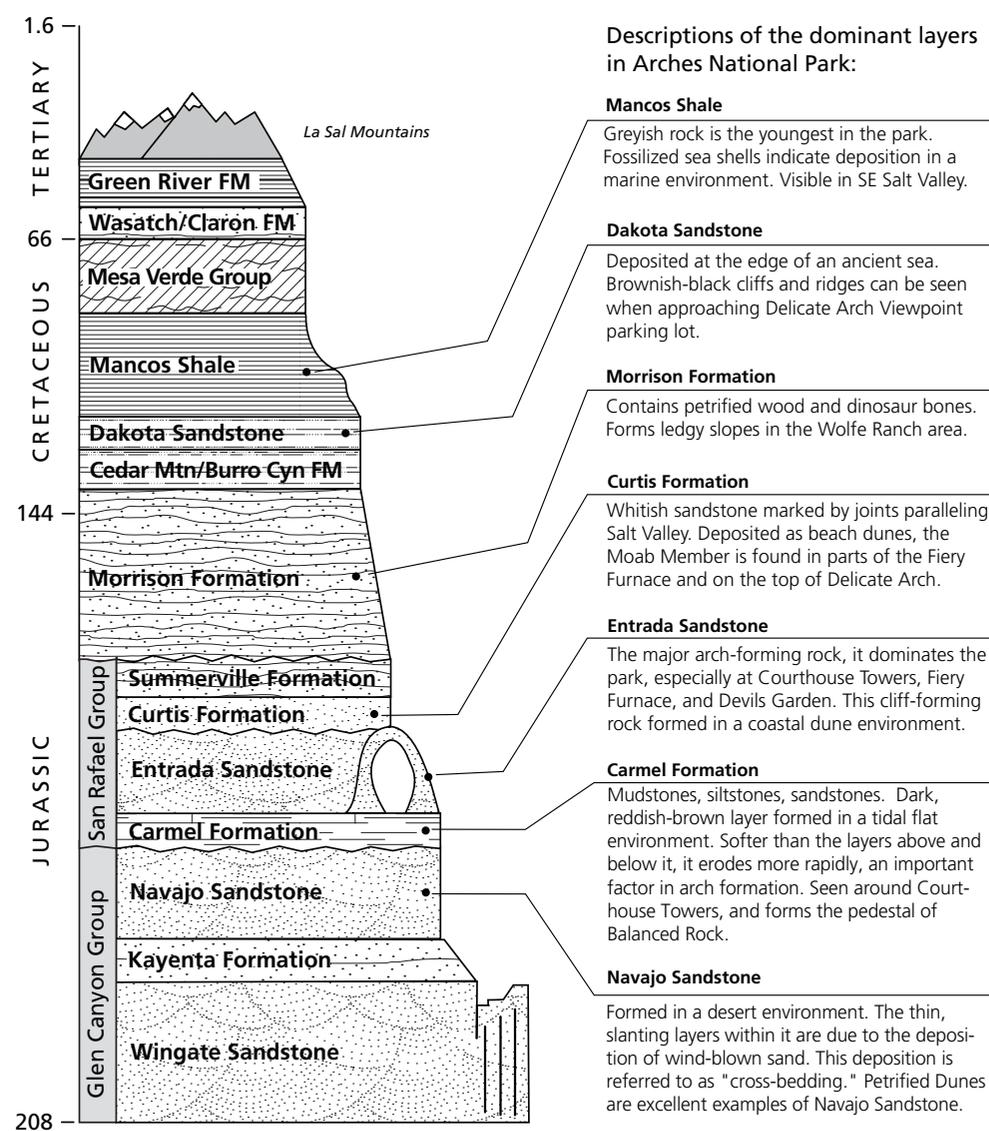


## Make sure your rocks don't rock and roll.

Luckily, earthquakes are rare in this area, otherwise these massive outdoor rock sculptures would splinter and collapse. The fact that over 2,000 still stand tells us this area has been rather geologically stable for at least 50,000 years.

## Lastly, pick the right time to visit. (You did.)

The rock layers visible in the park today were once buried by over a mile of other rock that had to erode first to expose what lay beneath. Visitors a million years ago might have seen an endless flat plain dotted with vegetation. Imagine a visit far into the future, when these layers have fully worn away. What new rock shapes might you discover then?



# Traces of the Past

FOR MOST OF ARCHES NATIONAL PARK'S LONG HISTORY, RED ROCK ARCHES DIDN'T EXIST. SALTY inland seas, braided river systems, coastal plains, and sand dunes fill the chapters in our geologic history book. How do we know? Geologists, like detectives, use clues such as fossils, ripple marks, and cross-bedding to understand the story of each geologic layer.

Marine fossils in the 300-million-year-old Honaker Trail Formation are remnants of an ancient sea. Cheerio-like discs of crinoid stems, lacy branches of bryozoans, and clam-like brachiopods tell the story of a warm, shallow sea teeming with life. Crinoids are animals that look like underwater flowers with feathery arms for collecting food. Trilobites, an early ancestor of the crab, crawled or swam among the corals. While crinoids, bryozoans, and brachiopods still exist, other animals, such as horn corals and trilobites, have been extinct for millions of years.

Fossils are not the only clues to the stories written in the rocks. Ripple marks reveal evidence of past running or lapping water. Both the main arch-forming layer, Entrada

Sandstone, and the tan Navajo Sandstone, show diagonal lines called cross-bedding. These are the inner structure of ancient sand dunes frozen in time. Amazingly, geologists can figure out ancient wind direction by studying cross-bedding. Visit Petrified Dunes Viewpoint for a taste of the largest dune field in the history of North America.



Cross-bedding—evidence of ancient dunes—near the Windows.

To see some local fossils and other geologic clues, visit the Arches Visitor Center geology display. Rangers can offer suggestions about where to view fossils in the Moab area. Remember, it is illegal to collect fossils or make plaster casts of them; leave them for future visitors and scientists to enjoy and study. This landscape has many stories to tell, from marine wonderland to dusty desert. The next time you're out on the trail, bring your curiosity and discover a page or two for yourself.

# Where Does My Money Go?

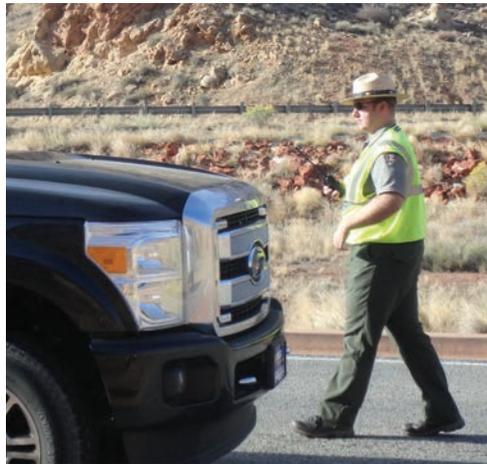
In 2004, Congress passed the Federal Lands Recreation Enhancement Act (FLREA), which replaced the Recreational Fee Demonstration Program. The law allows us to use 80 percent of fees collected at Arches National Park for repair, maintenance, and facility enhancement to support visitor enjoyment, visitor access, and health and safety.

Your fees also support visitor information and education, visitor services staff, informational signs; habitat restoration for wildlife observation or photography; and law enforcement services related to public recreation.

Fees for ranger-guided Fiery Furnace walks also remain in the park and go directly to supporting the program.

## Your user fees funded these improvements at Arches:

- Rehabilitating park trails
- Upgrading roadside bathrooms
- Picnic areas at Devils Garden and Delicate Arch Viewpoint
- Enhancing trailheads and pullouts
- Staff to assist with traffic and parking



Your fees support (clockwise from top left) Fiery Furnace hikes, trail maintenance, improved picnic areas, and staff support for parking and traffic congestion. NPS PHOTOS

# FIND YOUR PARK

The area surrounding Arches National Park is a treasure trove of recreational opportunities. During your visit, consider exploring these other parks and public lands.



## Canyonlands National Park

- Island in the Sky: 28 miles (45 km)
- The Needles: 79 miles (127 km)
- The Maze: 133 miles (214 km)

Canyonlands invites you to explore a wilderness of canyons and fantastically formed buttes carved by the Colorado River and its tributaries. Rivers divide the park into four districts: Island in the Sky, The Needles, The Maze, and the rivers themselves.



## Hovenweep National Monument

125 miles (201 km)  
Hovenweep includes six prehistoric villages built between A.D. 1200 and 1300. Explore a variety of structures, including multistory towers perched on canyon rims and balanced on boulders.



## Natural Bridges National Monument

124 miles (200 km)  
Three majestic natural bridges invite you to ponder the power of water in a landscape usually defined by its absence. View them from an overlook, or hit the trails and experience their grandeur from below.

**Other nearby public lands:**  
Colorado National Monument  
Manti-La Sal National Forest  
Dead Horse Point State Park  
Bureau of Land Management  
For more area information visit:  
[www.discovermoab.com](http://www.discovermoab.com)

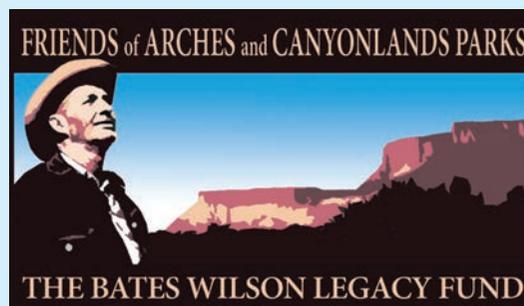
## Friends of Arches and Canyonlands Parks

The Friends of Arches and Canyonlands Parks: Bates Wilson Legacy Fund provides direct support to Arches and Canyonlands national parks and Natural Bridges and Hovenweep national monuments in order to enhance existing projects in these spectacular areas, and to conserve the land and its cultural treasures for present and future generations to enjoy.

This mission honors the legendary work of Superintendent Bates Wilson, who came to Arches in 1949, inspiring and leading the effort that resulted in the establishment of Canyonlands National Park in 1964. He is regarded by many as the "Father of Canyonlands."

### Bates Wilson firmly believed that:

- The park visitor must have a great experience;
- Preservation is our obligation to future generations;
- Exploratory and educational opportunities must abound;
- Youth indeed are the future: Bates enhanced the lives of countless young people as they explored and learned to appreciate the parks with him.



Please visit [www.foacp.org](http://www.foacp.org) to learn more and make your donation. Thanks!

Canyonlands Natural History Association (CNHA) is the official nonprofit partner of the National Park Service, Forest Service, and Bureau of Land Management in southeast Utah. Since 1967, CNHA has donated over 10.5 million dollars to these federal partners.

CNHA sells hundreds of items about Arches National Park and the rest of Utah's canyon country. Your purchase supports public education and research at the park.

Visit CNHA's outlets at Arches Visitor Center and Moab Information Center (corner of Center & Main in Moab).

### Canyonlands Natural History Association

800-840-8978 (toll free)  
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