



Visitors hike in Devils Garden. JOHN CHAO

You Shared, We Listened

BY KAIT THOMAS

Arches is implementing a temporary timed entry system to help manage traffic in the park. From April 1 to October 31, 2023, visitors need to reserve a timed entry ticket before arriving. Timed entry tickets distribute visitation throughout the day and lessen congestion on roads and trails, which helps create a higher-quality visitor experience at Arches.

Why Timed Entry?

Between 2011 to 2022, visitation to Arches National Park grew over 73 percent, from 1 million to 1.8 million visitors per year. Most people arrived during similar peak hours each day.

As a result, the park experienced issues like roadway congestion, facility overuse, and associated safety hazards; overcrowding at sites and along trails; competition for parking and other conflicts; and loss of predictability of visits whenever the entrance temporarily closed until traffic abated. These issues have negatively impacted the quality of people's experiences and threaten natural and cultural features.

Program History

In 2022, after reviewing comments from members of the public, stakeholders, and elected officials, the National Park Service implemented a pilot timed entry system to proactively pace visitors' arrival into the park.

Preliminary data and visitor survey results from the 2022 pilot demonstrate that timed entry reservations better distribute vehicles and visitors throughout the day, provide more reliable and enjoyable access to the park, and help protect Arches' extraordinary landscape.


Next Steps


Timed entry is only one idea on the table. Information collected during this year's temporary program will help Arches determine timed entry's viability as a longer-term solution. Timed entry, or another congestion management strategy, may be implemented more permanently under the larger visitor use plan that the park will begin in 2023.


For more information, including step-by-step ticket purchasing instructions and frequently asked questions, scan the QR code or visit: go.nps.gov/ArchesTicket.


Welcome to Arches


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


 **Drink water.** It is easy to become dehydrated here, 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.


 **Walk on hard surfaces, watch your step.** Stay on trails to protect fragile living soil crusts and plant and animal habitat, and to reduce your risk of getting lost. Don't cross wood or rock at trail edges.


 **The sun is intense, and shade is rare.** Avoid exertion during peak heat (>90°F /32°C). Protect yourself with sunscreen, sunglasses, and a hat.


 **Do not rely on cell service at Arches.** Coverage varies throughout the park. **Emergency? Call 911.**


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


 **Pets are not allowed on trails.** Activities with pets are limited in the park. See page 2 for details on where you can bring your pet.


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

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

 **Leave the rocks as you see them.** Carving, scratching, or chalking marks onto rocks is illegal and causes irreparable damage.

 **Find your way.** Cairns (small rock piles) mark routes. Don't build your own; they could mislead other hikers. If you get lost, stay where you are, and wait for rescue.

 **Preserve natural darkness.** Using artificial light sources to illuminate features for photography at night is prohibited.

 **Do not use ATVs.** It's prohibited to use any type of ATV or OHV. There are many roads outside the park where you can use ATVs and OHVs.

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/arch

Visitor Guide 2023, Volume 1

Arches Visitor Guide is published by Canyonlands Natural History Association, a nonprofit organization that assists the National Park Service in its educational, interpretive, and scientific programs. For more information, see page 8.

The NPS App is Here.



Search "National Park Service" in the apps store to download and begin exploring.

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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. Fees are subject to change.

Entrance Fees	
Single vehicle (per vehicle)	\$30
Motorcycle (per vehicle)	\$25
Pedestrian/Bicycle (per person)	\$15
Interagency Annual Pass	\$80
Southeast Utah Parks Pass	\$55

Passes for US citizens or permanent residents with disabilities, seniors, military veterans, 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 for a half day on Thanksgiving and 12/24, and for a full day on 12/25.



FOOD, GAS, AND LODGING

There is no food, gas, or lodging in the park. The town of Moab, five miles from the park entrance, has a full complement of restaurants, lodging, grocery stores, gas stations, and other services. For information visit www.discovermoab.com.



CAMPING

Devils Garden Campground has 50 sites and is located 18 miles from the park entrance. The campground has two group sites for groups of 11 or more. The campground is usually full every day, March through October. We recommend reserving a site before you arrive. If you don't have a reservation, plan to use other area camping options. For camping outside the park, ask at the visitor center, or visit www.discovermoab.com



SHARE THE ROAD

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



RESERVATIONS

You can reserve: • timed-entry tickets for visits April 1-October 31 up to three months in advance • standard campsites up to six months in advance, • group campsites up to 12 months in advance • ranger-led Fiery Furnace hikes (see below) and self-guided permits up to seven days in advance. Visit Recreation.gov or call 877-444-6777 (toll free), 877-633-6777 (TTY), or +1 518-885-3639 (international).



PETS

You **may** have your pet at Devils Garden Campground and may walk your pet along roads and in parking lots. You **may not** have pets on hiking trails, at overlooks, or anywhere in the backcountry, even in carriers. Pets must be on a leash no longer than six feet (1.8 m) at all times. Do not leave pets in vehicles when temperatures are above 65°F (18°C); they can die of heat exhaustion. Moab has kennels with boarding services. Many public lands outside the park allow pets.



ACCESSIBILITY

People with **mobility impairments** can access: • visitor center and toilets throughout the park • Devils Garden Campground site 4H • Park Avenue Viewpoint: Paved • Delicate Arch Viewpoint: Hard surface, level • Balanced Rock Viewpoint: Paved, level • Wolfe Ranch Cabin/Petroglyph Panel: Hard surface, level • Double Arch: Hard surface with slope; may need assistance. See park website for trail grades and other details.

For people who are **deaf** or have **hearing loss**, we have a variety of publications at the visitor center and exhibits throughout the park. All video programs are captioned.

At the visitor center, we have audio recordings, tactile models, maps, and rock samples for people who are **blind** or have **low vision**. We also have large print and braille publications of the park brochure. At the bookstore, you can purchase or rent an audio tour of the park's scenic road.

Service animals—only dogs and horses trained to perform specific tasks for a person with a disability—are allowed on trails. Emotional support ("therapy") animals are not considered service animals under the Americans with Disabilities Act and are not allowed on trails.

Things to Do



RANGER PROGRAMS

Check the visitor center or website for information on ranger programs and special events. Programs are always subject to change.

Evening Programs May be offered most nights in summer at Devils Garden Campground amphitheater. 45 minutes. Free.

Fiery Furnace Hikes May be offered daily, spring through fall. These physically demanding hikes require scrambling up and through narrow cracks and along ledges above drop-offs. Children under 5 are not permitted. Make reservations on Recreation.gov. Tickets cost \$16 per person.



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. Read more stargazing tips on page 6.



CYCLING

Ride bicycles or e-bikes only on roads—not on hiking trails or off-road. Shoulders are narrow; there are no bike lanes. There may be large vehicles on the road. Ride single file. The unpaved Willow Springs Road offers an enjoyable two- to three-hour ride. Most popular biking trails are on Bureau of Land Management (BLM) land.



HIKING

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



BACKPACKING

Arches has only a few areas for overnight backpacking. Outside the developed visitor area there are no designated trails or reliable water sources. To backpack at Arches, you must obtain a backpacking permit and camp in designated sites. Permits are issued in person at the Backcountry Permit Office two miles south of Moab, 2282 SW Resource Blvd, Monday through Friday, and some weekends.



CLIMBING AND CANYONEERING

Most routes require advanced skills. Plan ahead, and be prepared for self-rescue. Follow all regulations, route closures, and group size limits. Get permits and route information on the park website. **Climbing of any type is prohibited on all arches and prominent features, including Balanced Rock.** Slacklining is always prohibited.



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. **"Light Painting," or using artificial light sources to illuminate features at night, is prohibited.** Stay on trails, washes, or bare rock.

Early Morning Moab Fault • 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

We Need Your Help

BY RACHEL JOHA

Over 1.8 million people a year enjoy Arches National Park. Each of us can play a role in protecting and preserving our public lands. The Seven Principles of Leave No Trace are helpful guidelines to minimize your impact anywhere you visit.

Plan Ahead and Prepare

Plan your trip activities to match your skills, abilities, and current conditions. Carry enough water, a map, food, and appropriate gear on every hike. Dozens of hikers at Delicate Arch and Devils Garden get in trouble each year from lack of preparation.

Travel and Camp on Durable Surfaces

Concentrating your activity on non-vegetated durable surfaces (e.g. a trail, rock, a drainage path, or pavement) spares vegetation, sand dunes, and soil crust from damage. Even desert puddles, whether wet or dry, may contain living organisms. Walk around them.

Dispose of Waste Properly

“Pack it in, pack it out.” Don’t leave behind any trash or food scraps. In arid climates, organic litter (orange peels, nut shells) does not decompose well. “Go before you go.” Use the trailhead bathrooms before hiking and carry a human waste disposal bag for emergencies.

Leave What You Find

Carving, scratching, or chalking marks onto rocks causes irreparable damage and is illegal. Cairns (stacks of rocks) mark routes in the park. Don’t change existing ones or build your own, which can mislead other hikers.

Minimize Campfire Impacts

Never leave a fire unattended, and thoroughly extinguish all fires. Fires are only allowed in designated pits at Devils Garden Campground and in picnic areas. Collecting wood is not allowed in the park.

Respect Wildlife

Do not feed or chase wild animals. Observe them quietly from a safe distance. Secure all food and trash so clever ravens can’t get into it. Keep pets under control and leashed at all times. Pets are not allowed at overlooks, on trails, or in the backcountry, even if carried.

Be Considerate of Other Visitors

Avoid disrupting natural quiet with loud music or shouting. Remember— you’re sharing this place with others. Respect and protect the quality of everyone’s outdoor experience.

Thank You!

Practicing these principles shows your love for public lands and helps preserve them for future generations.



It Doesn't Wash Away



We find graffiti in the park nearly every day. Don't do it.

NPS

Even though light scratching on rock looks like sidewalk chalk, it isn't, and in this dry climate even chalk won't wash away for weeks, maybe months. Scratches, carving, chalking, painting— whatever the medium, it's all vandalism.

Vandalism: action involving deliberate destruction of or damage to public or private property. Years ago, marks on rock were the only way to show the world where you've been, but today's technology offers many alternatives that don't cause damage.

Some Native Americans believe that Arches National Park is a sacred place, and many others feel a spiritual connection to these rocky landscapes. To them, graffiti applied anywhere in the park is a senseless and selfish act that defaces a hallowed place.

Removing graffiti leaves its own mark. Rubbing off light scratches leaves an unnaturally smooth surface. Deeply incised carving requires the use of power grinding by a skilled operator.

Especially deep and extensive carvings must be filled in with ground sandstone and an acrylic bonding agent, and painted with organic pigments. Treated areas require monitoring, lest a new graffiti garden grow in its place.

National parks bring people from around the world together. Why do a few people choose vandalism as a park experience? Regardless of the answer, we require vigilance to combat graffiti at Arches. We must act quickly to discourage additional harm by copycat offenders.

Your involvement is crucial. Choose to leave no trace by not marking on rocks. Talk to friends and family about why graffiti is not OK and report any violations you witness.

Together, our shared care and concern can help preserve national parks and monuments for future generations to enjoy.

Share the Scenery

Arches' annual visitation is approaching 2 million people. The breathtaking scenery attracts people from around the world.

Park staff have been working to manage traffic in the park since 2006. In 2023 we will pilot another temporary timed entry reservation system (see page 1).

You can use these tips to have an enjoyable experience and to help preserve these timeless landscapes for others to enjoy:

- **Be flexible.** 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

During the busy season, you may see rangers assisting in crowded parking lots. Please follow their directions.

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, move to another area and come back later.**

Hey Kids— This One's For You!



NPS / ANDREW KUHN

Do you want to explore Arches and help protect the park? 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. You'll earn a badge and certificate and join the ranks of the many junior rangers who help protect this special place.



NPS / SHEENA HARPER

Plan Your Visit

DRIVING

In 1½ hours, you can:

- Drive to The Windows 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.

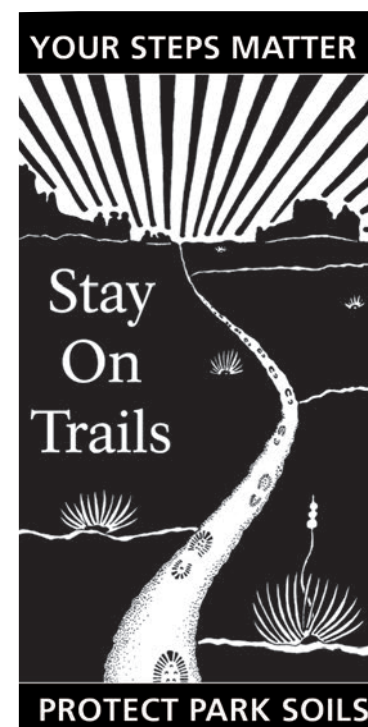
HIKING

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




- Hike The Windows trail and 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 fns in Devils Garden to see Landscape Arch, North America's longest natural stone opening.
- 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 fns.

In half a day, take one of these two hikes:

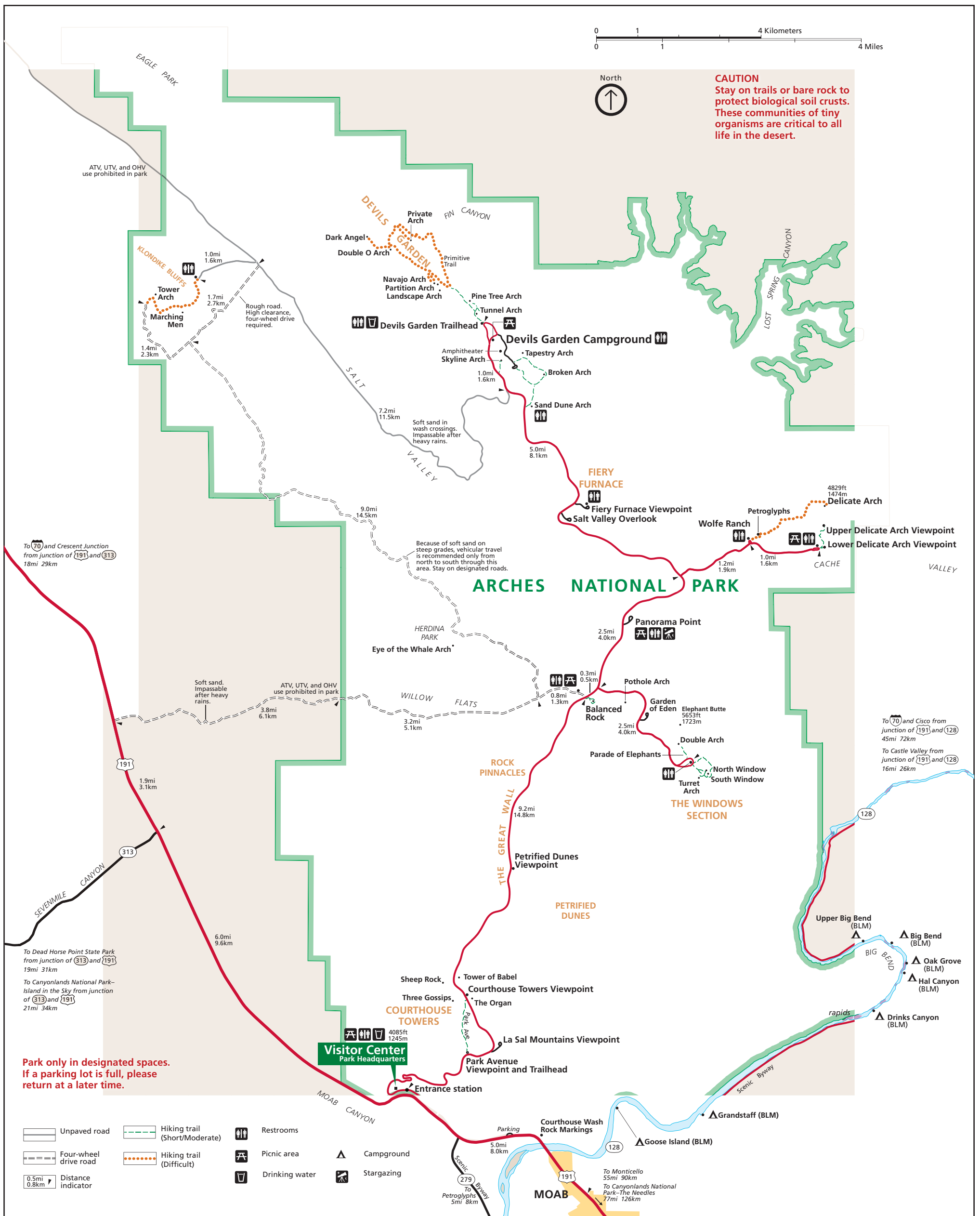
- Climb up the fns of Devils Garden Trail if you don't mind heights. On your way back, hike the primitive trail only if you're up for challenging slopes, exposure to heights, and narrow traverses.
- If you don't mind driving an unpaved road to the remote area called Klondike Bluffs, hike the primitive trail to Tower Arch.



Hiking

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

TRAIL	DISTANCE (ROUNDTrip)	TIME	ELEVATION CHANGE	DESCRIPTION
SHORT AND MODERATE TRAILS				
Nature Trail 	150 ft (45 m)	10 min	0 ft (0 m)	Learn about native desert plants on the nature trail behind Arches Visitor Center.
Park Avenue	1.8 mi (3.2 km)	60 min	322 ft (98 m)	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. To avoid stairs, start at Courthouse Tower.
Balanced Rock  	0.3 mi (0.4 km)	15-30 min	35 ft (11 m)	This is a loop trail at the base of a fragile, picturesque rock formation. Part of the trail is paved.
The Windows 	1 mi (1.6 km)	30-60 min	99 ft (30 m)	A gentle climb up a gravel trail, with steps, leads to the massive North and South windows and Turret Arch. Return via the same trail, or take the slightly longer primitive route around the back side of both windows.
Double Arch at The Windows 	0.6 mi (1 km)	15-30 min	30 ft (10 m)	A relatively flat trail leads to the base of two giant arch spans that are joined at one end.
Delicate Arch Viewpoints  	200 ft (61 m)	5-15 min	0 ft (0 m)	<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 to the upper viewpoint, separated from Delicate Arch by a canyon.
	1.0 mi (1.6 km)	30-45 min	171 ft (52 m)	
Sand Dune Arch 	0.4 mi (0.6 km)	15-30 min	0 ft (0 m)	Hike through deep sand to a secluded arch tucked among sandstone fins. <i>Do not climb or jump off the arch.</i>
Broken Arch 	1.4 mi (2.3 km)	30-45 min	59 ft (18 m)	The trail crosses a large meadow to the arch. Extend the hike to 2.3 miles (3.7 km) roundtrip by hiking through the arch, past Tapestry Arch, and through the campground. Part of the longer loop includes some moderate scrambling.
Skyline Arch	0.4 mi (0.6 km)	10-20 min	28 ft (8 m)	A short, out-and-back hike on a flat, well-defined trail leads to an arch in a high wall.
Landscape Arch at Devils Garden  	1.8 mi (2.9 km)	30-60 min	40 ft (12 m)	A hard-packed trail slopes up and down to a spectacular ribbon of rock. <i>The trail beyond Landscape Arch becomes difficult, with rock scrambling, narrow ledges, and exposure to heights—see Double O Arch.</i>
Courthouse Wash Panel	0.8 mi (1.4 km)	30-60 min	60 ft (18 m)	Park 0.5 miles (0.8 km) north of the Colorado River on US 191. A short walk across the Courthouse Wash bridge and a brief climb leads to a prehistoric panel of pictographs (at the base of the cliffs, facing west).
LONGER, MORE STRENUOUS TRAILS				
Delicate Arch at Wolfe Ranch 	3.2 mi (5.1 km)	2-3 hrs	538 ft (164 m)	<i>Take at least 2 quarts (2 L) of water per person. Avoid during midday summer heat.</i> This trail climbs up a steep slickrock slope with no shade and some exposure to heights. Just before you get to Delicate Arch, the trail follows a narrow rock ledge for about 200 yards (183 m), which is often icy in winter. Interpretive guide available at trailhead.
Tower Arch at Klondike Bluffs 	2.6 mi (4.2 km)	2-3 hrs	290 ft (89 m)	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 (0.6 mile [1.0 km] roundtrip) 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.
Double O Arch at Devils Garden  	4.0 mi (6.4 km)	2-3 hrs	275 ft (84 m)	The trail beyond Landscape Arch climbs steeply onto sandstone slabs. There are uneven surfaces and narrow ledges with steep drop-offs. Spur trails lead to more arches. Dark Angel is 0.4 miles (0.6 km) beyond Double O Arch.
Devils Garden all trails  	7.9 mi (12.7 km)	3-5 hrs	286 ft (87 m)	<i>Take at least 3 quarts (3 L) of water per person.</i> Full Devils Garden trail system includes Landscape Arch, Double O Arch, Dark Angel, and the primitive trail. This challenging hike involves narrow ledges, steep exposures, uneven surfaces, rock scrambling, and few trail markers. Trail guide available. <i>Avoid when rock is wet or icy.</i>
Fiery Furnace (Fee Area) 	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 self-guided day-use permit (\$10 per person). Reserve permits and hike tickets through Recreation.gov. Everyone in your group must be present at the visitor center to pick up your reserved Fiery Furnace permit.			



Trailhead parking is limited. If parking lots are full, move on and come back later.
Park only in designated spaces.

2023 Night Sky Almanac

Stargazing Tips

Look for a high viewpoint or a wide open area to see the most stars. Try stargazing at Panorama Point or The Windows Section. Give your eyes 20-30 minutes to adjust to the darkness. Skies will be darkest when the moon is out of sight. Use a red flashlight to protect your night vision, or just cover a white flashlight with red fabric or cellophane. Help other stargazers by not shining your headlights or flashlights on rock formations (prohibited). Check for star charts and other stargazing tips at the visitor center.

Meteor Showers

(best viewing midnight to dawn)

JANUARY 3-4 Quadrantids Meteor Shower

APRIL 22-23 Lyrids Meteor Shower

MAY 5-6 Eta Aquarids Meteor Shower

AUGUST 12-13 Perseids Meteor Shower

OCTOBER 8-9 Draconids Meteor Shower

OCTOBER 21-22 Orionids Meteor Shower

NOVEMBER 17-18 Leonids Meteor Shower

DECEMBER 14-15 Geminids Meteor Shower

DECEMBER 22-23 Ursids Meteor Shower

Moon Phases

JANUARY 6 Full Moon • **21** New Moon

FEBRUARY 5 Full Moon • **20** New Moon

MARCH 7 Full Moon • **21** New Moon

APRIL 5 Full Moon • **19** New Moon

MAY 5 Full Moon • **19** New Moon

JUNE 3 Full Moon • **17** New Moon

JULY 3 Full Moon • **17** New Moon

AUGUST 1, 30 Full Moon • **16** New Moon

SEPTEMBER 29 Full Moon • **14** New Moon

OCTOBER 28 Full Moon • **14** New Moon

NOVEMBER 27 Full Moon • **13** New Moon

DECEMBER 26 Full Moon • **12** New Moon

Other Dates

MARCH 20 Spring Equinox

JUNE 21 Summer Solstice

SEPTEMBER 23 Autumnal Equinox

OCTOBER 14 Annular Solar Eclipse

DECEMBER 21 Winter Solstice



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

"Bird brain" isn't an insult when it comes to ravens; they actually have large brains and are extremely intelligent. Cognitive processes such as imitation, insight, and the superb ability to solve problems truly set 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. 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.



NPS / ANDREW KUHN

A Microscopic Community

Biological soil crust is a living groundcover that forms the foundation of high desert plant life in Arches and the surrounding area. Cyanobacteria dominates this knobby crust, but it also includes lichens, mosses, 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 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 soil particles, forming an intricate web of fibers. The fibers join loose soil particles 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 up to 4 inches (10 cm) deep.

Vascular plants can't use 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.



NPS / NEAL HERBERT

Soil crusts also trap and store water, nutrients, and organic matter that might otherwise be unavailable to plants.

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, taking up to 50 years for cyanobacterial growth. Lichens and mosses may take even longer to recover.

Help 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.

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. They formed a hard rock that is very porous (full of tiny spaces), while The Carmel Formation, made of sand and clays, is softer and resists water.

Crack it into parallel lines.

Deep beneath the surface lies a thick layer of salts. Squeezed by rock above and below, 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, but gets trapped by the Carmel. It can slowly dissolve the calcite bonding the sand together—in other words, rotting rock from the inside out. In winter, water trapped in cracks expands when it freezes, then contracts, prying the rock apart.

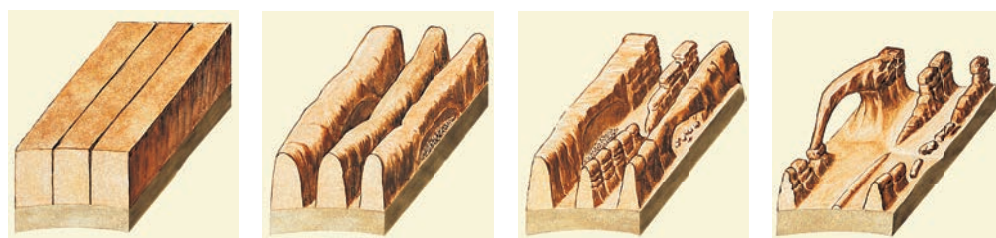
If the park received too much precipitation, the sandstone could erode so quickly that arches might not have time to form. If it never rained here, the engines of erosion would stop.

Let the water do its work.

As erosion happens, a variety of shapes begin to appear. Rock walls erode into fins, then holes form. 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 hiking trail.

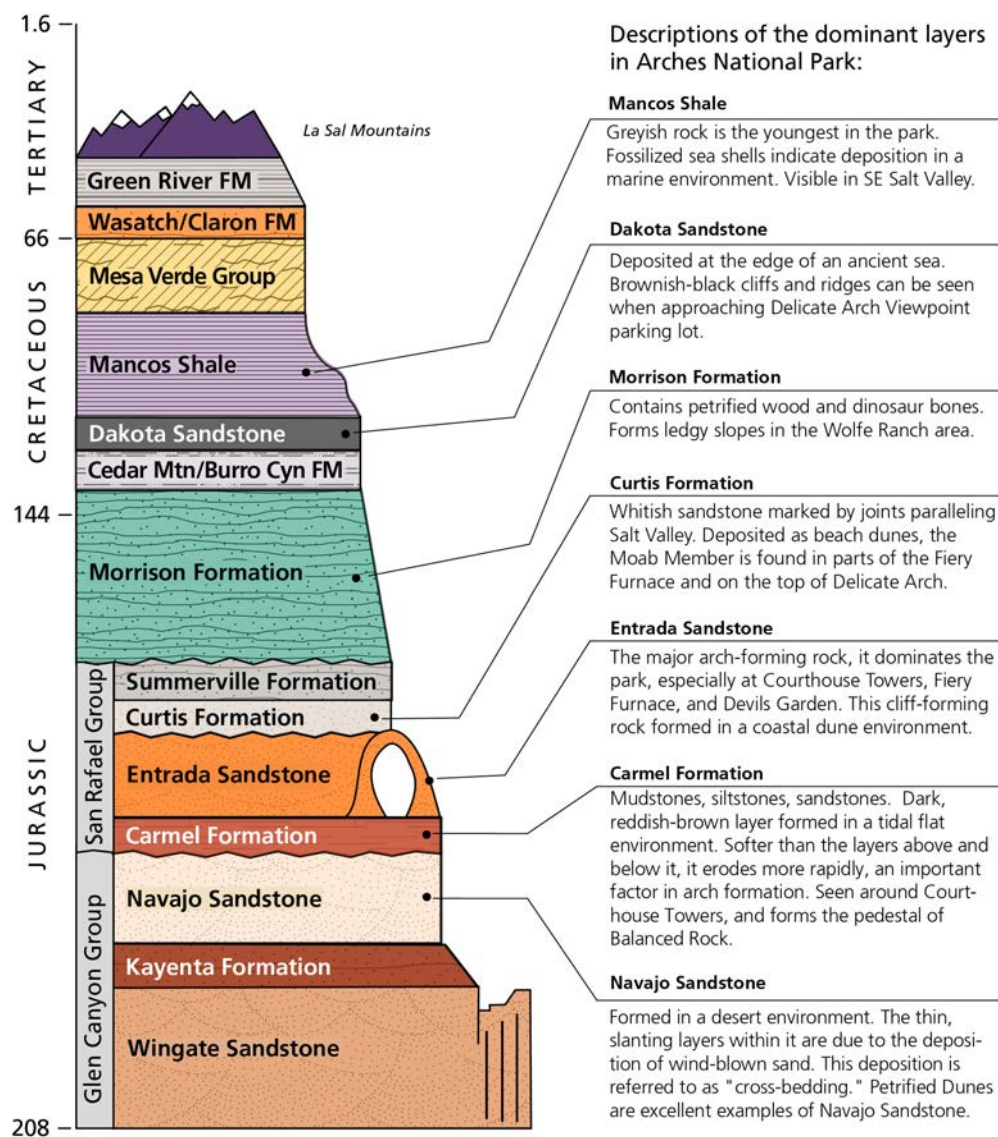


Make sure your rocks don't rock and roll.

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 millions of years ago might have seen a wide 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.

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.



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

Where Does My Money Go?

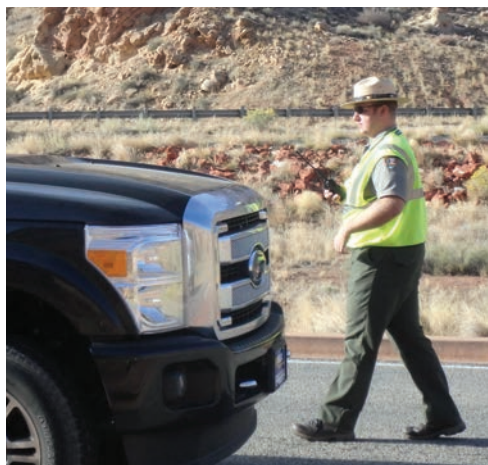
In 2004, Congress passed the Federal Lands Recreation Enhancement Act (FLREA), which replaced the Recreational Fee Demonstration Program. The law allows us to use 80 percent of fees collected at Arches National Park for repair, maintenance, and facility enhancement to support visitor enjoyment, visitor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

Your fees also support visitor information and education, visitor services staff, and 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 toilets
- Picnic and stargazing area at Panorama Point
- New trailhead signs and waysides
- Staff to assist with traffic and parking



Your fees support (clockwise from top left) new toilet facilities, a stargazing area at Panorama Point, improved picnic areas, and staff support for parking and traffic congestion.

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.

Your purchase supports interpretation, education and research at Arches National Park.

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 \$22 million to these federal partners.

CNHA offers a wide selection of merchandise featuring Arches National Park and the surrounding canyon country area. You can shop online at shop.cnha.org

Canyonlands Natural History Association

435-259-6003
www.cnha.org

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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

www.nps.gov/cany

- Island in the Sky: 28 miles (45 km)
- The Needles: 77 miles (124 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

www.nps.gov/hove

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

www.nps.gov/inabr

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