

Arches

National Park
Utah

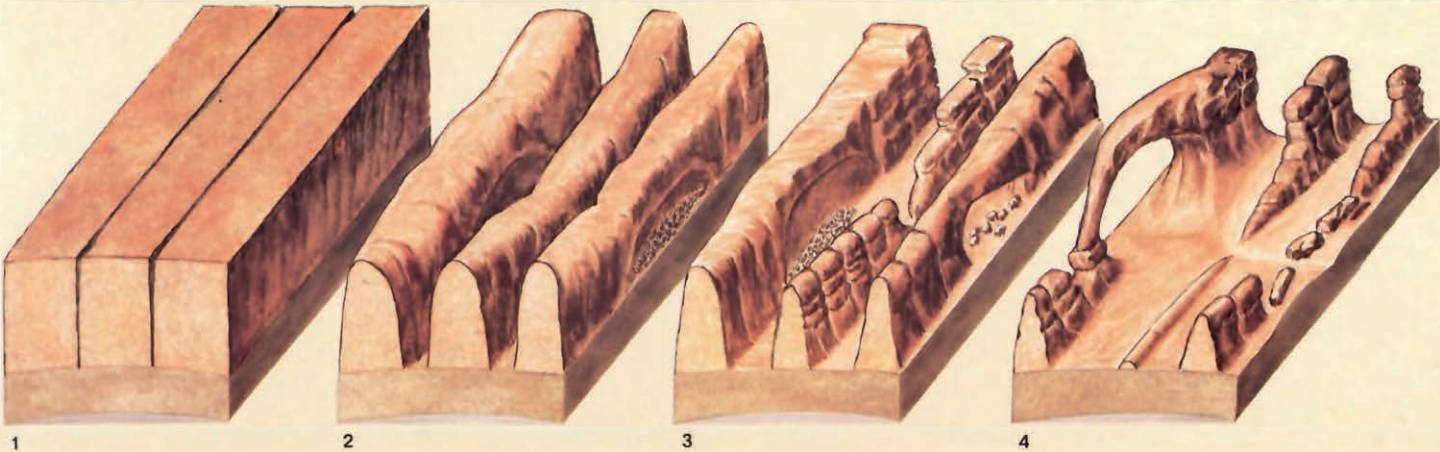
National Park Service
U.S. Department of the Interior



Delicate Arch
Gordon Anderson

How Are Arches Formed?

1 As the Earth up-warped here, deep cracks penetrated to the buried sandstone layer. 2 Erosion wore away exposed rock layers and enlarged the surface cracks, isolating narrow sandstone walls, or fins. Alternating frosts and thawing caused 3 crumbling and flaking of the porous sandstone and eventually cut through some of the fins. 4 The resulting holes were enlarged to arch proportions by rockfalls and weathering. Arches eventually collapse, leaving only buttresses that in time will erode. Some natural bridges may look like arches, but they form in the path of streams that wear away and penetrate the rock. Natural Bridges National Monument is a superb place to view these bridges. Pothole arches form by chemical weathering as water collects in natural depressions and eventually cuts through to the layer below.



The Greatest Density of Arches in the World

Wind and water, extreme temperatures, and underground salt movement are responsible for the sculptured rock scenery of Arches National Park. On blue-sky days, it is hard to imagine such violent forces—or 100 million years of erosion of sandstone—creating this land that boasts the greatest density of natural arches in the world. The more than 1,500 catalogued arches range in size from a 3-foot opening, the minimum considered an arch, to Landscape Arch. This 105-foot-high ribbon of rock measures 306 feet from base to base. All stages of arch formation and decay are found here. Delicate Arch, an isolated remnant of a bygone fin, stands on the brink of a canyon, with the dramatic La Sal Mountains for a backdrop. Spires and pinnacles and balanced rocks perched atop seemingly inadequate bases vie with the arches as scenic spectacles.

Arches National Park lies in southeastern Utah's red rock country. For a short stretch the Colorado River borders the park. A bridge on U.S. Highway 191 connects the park with Moab, Utah. Near this bridge users of the Old Spanish Trail swam mules across in the 1830s. A remnant of the trail adds historical intrigue to Arches. So does Wolfe Ranch, the remains of a typical early-West cattle operation.

The Geologic Story. The national park lies atop an underground salt bed, which is basically responsible for the arches and spires, balanced rocks, sandstone fins, and eroded monoliths that make the area a sightseer's mecca. Thousands of feet thick in places, this salt bed was deposited over the Colorado Plateau some 300 million years ago when a sea flowed into the region and eventually evaporated. Over millions of years, the salt bed was covered with residue from floods and winds and the oceans that came in intervals. Much of this debris was compressed into rock. At one time this overlying earth may have been 1 mile thick.

Salt under pressure is unstable, and the salt bed below Arches was no match for the weight of this thick cover of rock. Under such pressure it shifted, buckled, liquified, and repositioned itself, thrusting the earth layers upward into domes. Whole sections dropped into cavities. In places they turned almost on edge. Faults occurred. The result of one such 2,500-foot displacement, the Moab Fault, is seen from the visitor center.

As this subsurface movement of salt shaped the Earth, surface erosion stripped away the younger rock layers. Except for isolated remnants, the major formations visible in the park today are the salmon-colored Entrada Sandstone, in which most of the arches form, and the buff-colored Navajo Sandstone. These are visible in layer cake fashion throughout most of the park. Over time water seeped into the superficial cracks, joints, and folds of these layers. Ice formed in the fissures, melted under extreme desert heat, and winds cleaned out the loose particles. A series of free-standing fins remained. Wind and water attacked these fins until, in some, the cementing material gave way and chunks of rock tumbled out. Many damaged fins collapsed. Others, with the right degree of hardness and balance, survived despite their missing sections. These became the famous arches. This is the geologic story of Arches—probably. The evidence is largely circumstantial.

Wolfe Ranch. John Wesley Wolfe, a disabled Civil War veteran, and his son, Fred, settled here in 1888. A weathered log cabin, root cellar, and corral remain as evidence of their primitive ranch. What brought them here from Ohio and how they found this rugged land remains a mystery, but they managed a living with a small cattle operation for more than 20 years. A visit to Wolfe Ranch is a walk into the past.



Wolfe Ranch



Balanced Rock
Gordon Anderson



Double Arch
Frank L. Mendonca



Fiery Furnace walk

Much More Life Than Meets the Eye

Pinyon pines and gnarled juniper trees add a splash of green contrast to the red sandstone terrain. Desert flora abound in the park. In spring, when conditions are right, wildflowers bloom in profusion. From May to August colorful displays carpet moist places.

Wildlife here is characteristic of the sparse pinyon-and-juniper forest communities of the Great Basin Desert. Most species are nocturnal, but you might sight a mule deer, kit

fox, or more often, jack-rabbits and cottontails, kangaroo rats and other rodents, and small reptiles. Flocks of blue pinyon jays reside here. Mountain bluebirds and many other species are migratory. Golden eagles and red-tailed hawks are among the resident birds. Bald eagle and peregrine falcon sightings have been reported.

Microbiotic Crust. It's alive, so watch your step! But it won't bite you. Once called cryp-

togamic soil, this dark, brown-sugar-like stuff covers much of the terrain of untrampled desert area. Composed primarily of cyanobacteria (previously called blue-green algae) as well as lichen, algae, and fungi, this covering protects against surface erosion, absorbs moisture, and provides nitrogen and other nutrients for plant growth.

Avoid crushing these life-giving organisms. It is not asking much. Stay

on trails. Without these crusts, many of the plants that you see here probably would not be able to survive. And if the plants go, so do the animals. The desert could lose much of the life that makes it such a magical place.



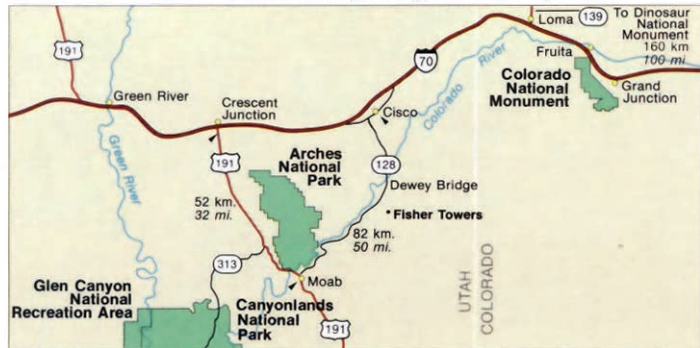
Golden Eagle
Gene Dieckhoner

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What the Park and Surrounding Canyon Country Offer



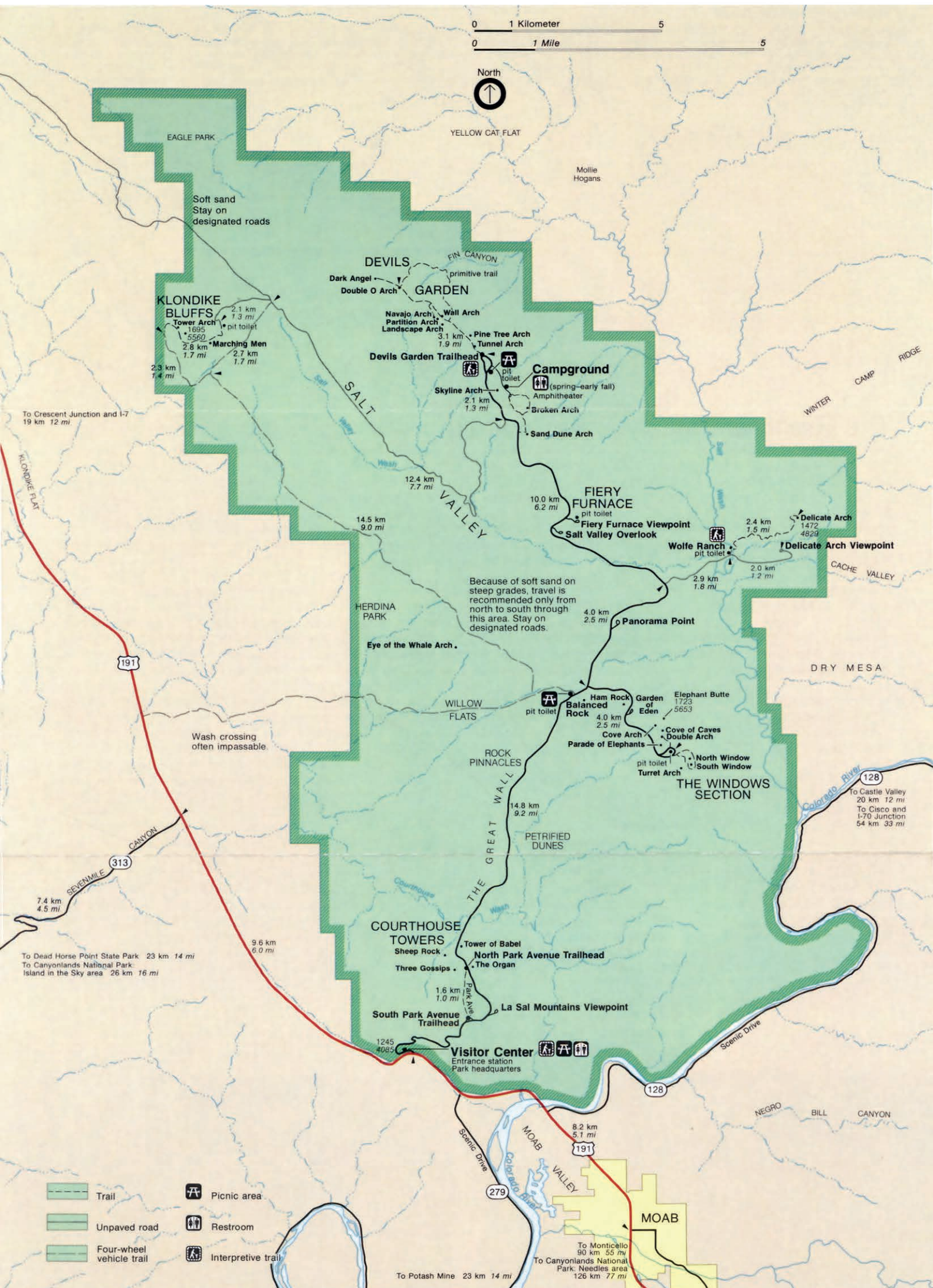
Points of Special Interest. Stop at the **visitor center** and ask advice on the best use of your time—whether an hour or a week—in the park and nearby areas. Watch a color slide orientation program, see the geology museum and history exhibit, and browse the maps and other publications. Ask about commercial tours and other programs. A self-guiding booklet for the drive along the park road is available. In season, ask about the naturalist-led Fiery Furnace Walk. Popular park features are listed below.

Park Avenue, balanced rocks, spires, and eroded fins that resemble a city skyline. **Courthouse Towers**, photographic mecca that boasts huge monoliths: Sheep Rock; Three Gossips; and a small arch in the making. **Balanced Rock**, world famous. **The Windows Section**, four large arches seen from the roadway: Double and Turret Arches and North and South Windows; the latter two, seen from Turret Arch, are known as the Spectacles; the Parade of Elephants—*no matter how short your stay, at least go as far as the Windows Section*. **Panorama Point**, vista of Salt Valley and of the Fiery Furnace—sometimes illuminated by sunset. **Wolfe Ranch**, old log cabin and ranch. **Delicate Arch**, see cover photo! **Salt Valley Overlook**, collapsed salt dome. **Fiery Furnace View-**

point, dramatic overview of exposed sandstone fins; starting point for daily 2-hour guided walk in season. **Skyline Arch**, doubled in size in the 1940s. **Broken and Sand Dune Arches**, short trails lead to a curiously eroded arch and to an arch beside a sand dune where children delight to romp.

Devils Garden Campground, some 50 tent and trailer sites, first-come, first-served, plus two walk-in group sites limited to tenting and available by reservation for 10 or more persons. Facilities include flush toilets and water until frost; chemical toilets and no water from November through mid-March. No fee is charged when the water is turned off. Campfire programs nightly in season at the amphitheater.

Devils Garden Trail, tremendously rewarding 2-mile walk from the trailhead to Double O Arch; ask about several other arches and the primitive loop trail. **Klondike Bluffs**, vast scenic area; magnificent Tower Arch; eroded fins of Marching Men; salmon-pink colored Entrada Sandstone features topped by white Moab Member sandstone; hikers should ask about the possibilities here. **Herdina Park**, primarily four-wheel-drive access; also good for backpackers; Eye of the Whale Arch found here.



For Your Safety

The climate and landscape at Arches pose special problems you should be aware of for your safety and convenience. Summer daytime temperatures can reach 43°C (110°F). Carry 4 liters (1 gallon) of water per person per day. **minimum.** Dehydration and heat problems can be fatal.

Sandstone slickrock is dangerous—it crumbles and breaks easily. Deaths from falls have occurred. Climbing down after an ascent may be impossible, leaving you rim-rocked. Technical rescues are expensive and dangerous. Rock climbing is permitted, but climbing on most features named on USGS maps is prohibited.

Drivers please note: The scenery here can lead you astray. Save sightseeing for the turnouts provided. And watch for other drivers who may be awestruck!

Regulations

It is your responsibility to know and obey park rules and regulations. Regulations are designed for your safety and for the protection of natural resources for posterity. Pets are not allowed on or off trails, in the backcountry, or in buildings. In the frontcountry they must be under physical restraint at all times. Pets left unattended in vehicles during the heat of the day can die from heat exhaustion. Wood gathering is prohibited.

Bring fuel for the grills provided, or bring a stove. Do not litter; we are proud of our reputation for cleanliness. Do not deface or disfigure features. Some of these magnificent sights exist on borrowed time as it is. Should you stumble across rare Indian rock writings, leave them alone. They are parts of a puzzle we hope to unravel someday.

Mountain bikes are allowed on established roads only; do not take them on trails or in the backcountry. If you have questions, ask at the visitor center, ask a ranger, or write the superintendent—address

at right. These are only some of the regulations. All federal and state laws are enforced in the park.

Backcountry Use

Backcountry overnight hikers must get a free backcountry permit at the visitor center. There are no designated backcountry trails, so you need a USGS map. Designated trails are marked with rock cairns. Stay on these trails to protect fragile desert soils and plant life. You must carry water. No fires are allowed. Do not hike alone. If you become lost, stay where you are. Aimless wandering wastes precious survival energy and can confuse searchers. All backcountry water should

be boiled two minutes before drinking to destroy Giardia organisms. Chemical treatment is not considered effective.

For information

The park superintendent's address is Arches National Park, P.O. Box 907, Moab, UT 84532. Telephone (801) 259-8161.

Preservation Plea

Please remember that this is a sanctuary for wildlife. Hunting and the use of firearms are prohibited. Do not disturb, deface, or destroy flowers, trees, wildlife, or other natural objects or artifacts.

Arches National Park is a unit of the National Park System, which consists of more than 350 parks representing important examples of our country's natural and cultural inheritance.

