

U.S. Department of the Interior  
U.S. Geological Survey

# Geologic Map of Colorado National Monument and Adjacent Areas, Mesa County, Colorado

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Independence Monument is an erosional remnant of a wall of Wingate Sandstone that once separated the North Entrance from the East Entrance of Monument Canyon. A resistant cap of silica-cemented Kayenta Formation helps protect the towering structure from erosion. Photograph by W.C. Hood, 1986.

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(Pamphlet accompanies map)

Prepared in cooperation with the National Park Service and the Colorado National Monument Association

## History

### The Human Story

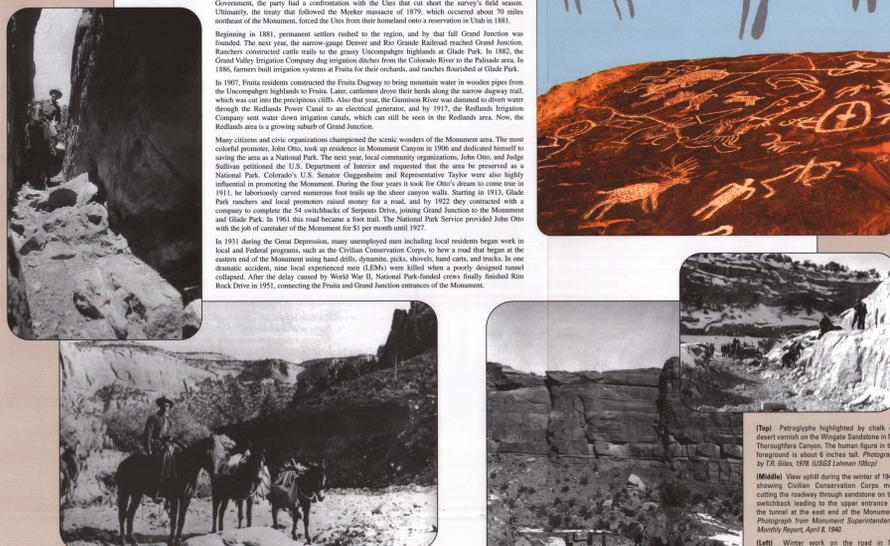
We don't know how long ago Ancestral Indians began to hunt in the canyons of Colorado National Monument, but one of the tools used to scrape hides was found in sediments in No Thoroughfare Canyon just below a piece of charcoal dated at 5,000 years old. The Ancestral Indians were eventually succeeded by the Fremont Indians, who hunted and grew corn. Ancestral Puebloan agriculture, pit-houses, and other wild foods. In turn, the Fremont culture vanished about 1,250 to 1,300 years ago to be replaced by the Ute Indians. The Utes lived a more nomadic life and depended upon their horses for hunting and traveling.

European began to arrive during the early 1800s, for traders and explorers came first. An adventurous P.F. Johnson and R. Johnson, both a trading post in Grand Valley by 1838, but this did not last. When Captain J.W. Gunnison and U.S. G. Beckwith arrived during their quest for a transcontinental railroad route, the only inhabitants they found were Ute. Beckwith described the Grand Valley of 1835 as "very barren (with) a meager supply of grass, cotton-wood and willow." When the 8th party of the Hayden Survey arrived in 1875 to record the topographic and geologic character of the West for the U.S. Government, the party had a confrontation with the Utes that cut short the survey's field season. Ultimately, the treaty that followed the Meeker massacre of 1879, which occurred about 70 miles northwest of the Monument, forced the Utes from their homeland onto a reservation in Utah in 1881.

In 1907, Fruita residents constructed the Fruita Dam to bring mountain water in wooden pipes from the Uncompahgre highlands to Fruita. Later, cattlemen drove their herds along the narrow dugway trail, which was cut into the precipitous cliffs. Also that year, the Gunnison River was dammed to divert water through the Redlands Power Canal to an electrical generator, and by 1917, the Redlands Irrigation Company sent water down irrigation canals, which can still be seen in the Redlands area. Now, the Redlands area is a growing suburb of Grand Junction.

Many citizens and civic organizations championed the scenic wonders of the Monument area. The most colorful promoter, John Oso, took up residence in Monument Canyon in 1906 and dedicated himself to saving the area as a National Park. The next year, local community organizations, John Oso, and Judge Sullivan petitioned the U.S. Department of Interior and requested that the area be preserved as a National Park. Colorado's U.S. Senator Gingham and Representative Taylor were also highly influential in promoting the Monument. During the four years it took for Oso's dream to come true in 1911, he laboriously carved numerous foot trails up the sheer canyon walls. Starting in 1913, Glade Park ranchers and local promoters raised money for a road, and by 1922 they contacted with a company to complete the 54-mile backcountry drive, joining Grand Junction to the Monument and Glade Park. In 1961 this road became a foot trail. The National Park Service provided John Oso with the job of caretaker of the monument for \$1 per month until 1927.

In 1931 during the Great Depression, many unemployed men including local residents began work in local and Federal programs, such as the Civilian Conservation Corps, to help a road that began at the eastern end of the Monument using hand tools, dynamite, picks, shovels, hand carts, and trucks. Its one dramatic accident, nine local experienced men (LEMs) were killed when a poorly designed tunnel collapsed. After the delay caused by World War II, National Park finished construction finally finished Sun Rock Drive in 1951, connecting the Fruita and Grand Junction entrances of the Monument.



(Above left) Riding down through "The Crack" from the southwest side of the Uncompahgre Plateau. Photograph by C.E. Hunt, 1929 (USGS Data 428)

(Above) John Oso, dedicated promoter of Colorado National Monument with his beloved horses and home. Sometime between 1909 and 1927. Photograph courtesy of Grand Junction Chamber of Commerce.

(Top) Petroglyphs highlighted by chalk on desert washes on the Wingate Sandstone in No Thoroughfare Canyon. The human figure in the foreground is about 8 inches tall. Photograph by G. Giese, 1978 (USGS Lohman 1092)

(Middle) View uphill during the winter of 1940, showing Civilian Conservation Corps men cutting the roadway through sandstone on the switchback leading to the upper entrance of the tunnel at the east end of the Monument. Photograph from Monument Superintendent's Monthly Report, April 8, 1942.

(Left) Winter work on the road in No Thoroughfare Canyon in 1940. High cliffs of Wingate Sandstone are in the background. Photograph from Monument Superintendent's Monthly Report, April 8, 1942.

## Ecology

### Rich Life in an Arid Land

The Grand Valley has an arid climate, averaging less than 10 inches of precipitation each year. Summer days commonly exceed 100° F, and relatively mild winters with little snow can be interrupted by short periods of intense subzero cold. Without irrigation, the valley would be nearly barren. The cooler and wetter climate of the Monument highlands sustains more abundant plant life, and springs supplement uncertain streams that are used by a varied animal population. Most of the precipitation falls in late summer when large thunderstorms can create sudden flash floods that rush through narrow canyons in the Monument. Water in these narrow canyons runs several feet in a few minutes and has the force to tumble boulders 5 feet in diameter down the streams.

Pine-jumper forests with an understory of mountain mahogany, serviceberry, sagebrush, and grasses cover most of the highlands above elevations of about 5,800 feet in the Monument. Where fine sand and silt floor the canyons, sagebrush, saxi, and Gambel's oak grow, and cottonwood trees border intermittent streams. An arid scrubby forest of Pliocene basement rock, sparse vegetation struggles to live.

A surprisingly diverse population of larger mammals inhabits the canyons and highlands: mule deer, mountain lion, bobcat, gray fox, coyote, bear, and magpie. Occasionally, reintroduced desert bighorns show up in the region. The many smaller mammals that form the base of the predator food chain include cottontail and jackrabbits, squirrels, chipmunks, and marmots of mice.

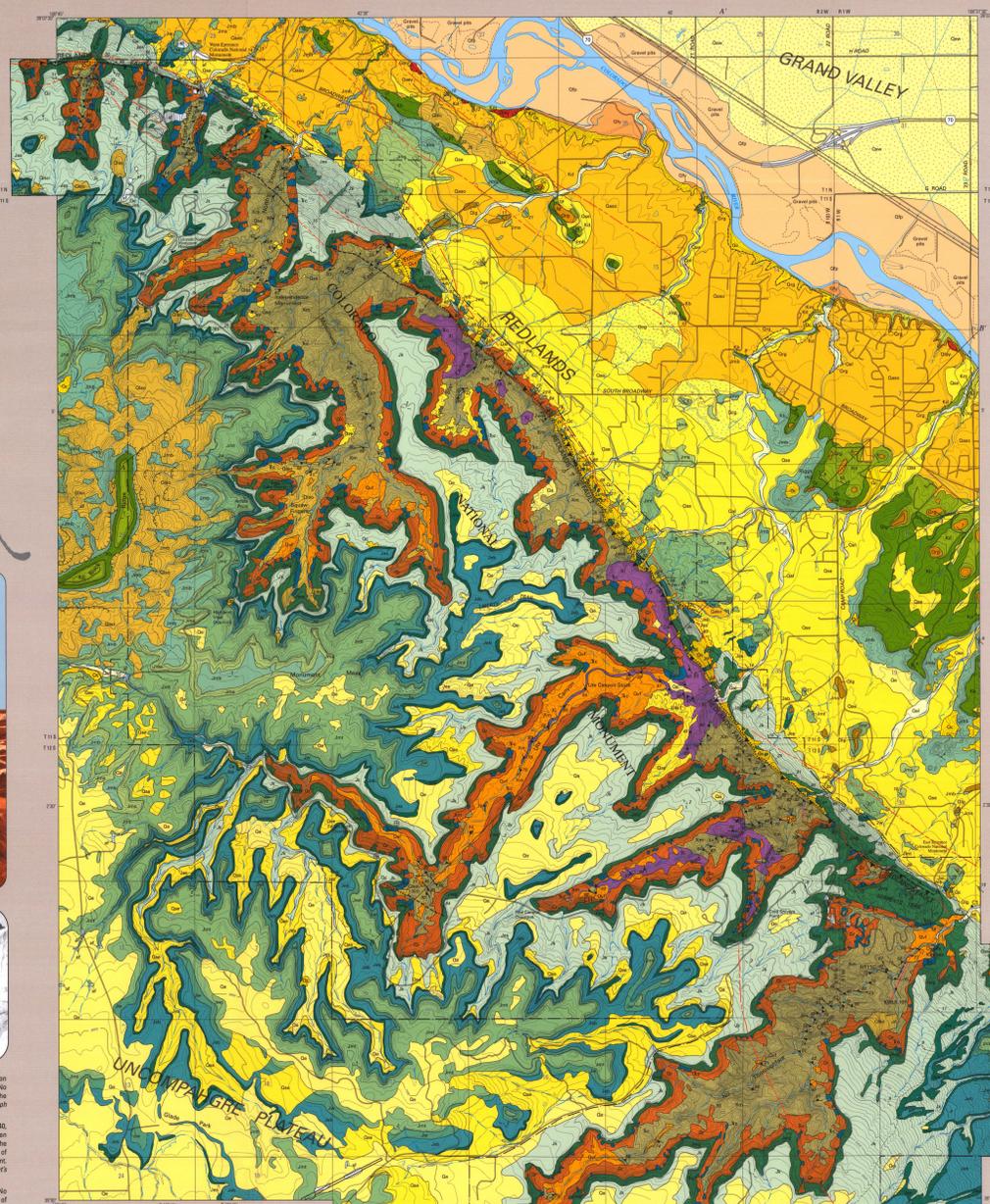
Raccoons scree jays, pylon jays, and magpies, tiny rock wrens and titmouse, house finches, dark-eyed juncos, mourning doves, Gambel's quail, meadowlark canyon wrens, and cross-billed hawk and black-chinned humbird fill above the trees, grasses, and flowers. Golden eagles and red-tailed hawks soar in and above the canyons and great horned owls silently search for prey. Prairie falcons are particularly fond of the rock doves (sagebots) that also nest on the cliffs. Violet-green swallows swoop playfully past visitors near cliff edges. Ravens and turkey vultures make wide sweeps of the skies in search of carrion. Several species of lizards scurry about the rocky terrain but visitors are most impressed with the colorful collared lizard. Although gopher snakes are more common, faded midget rattlesnakes also inhabit the monument along with spadefoot and red-spined lizards, tree frogs, and clouded tiger salamanders.



(Above) Close-up of Pylon pine branch. Photograph by F.C. Brunstein, 2000

(Above Middle) Pylon pine. Photograph by Ralph Smith, 1990

(Right) Juniper. Photograph by F.C. Brunstein, 2000



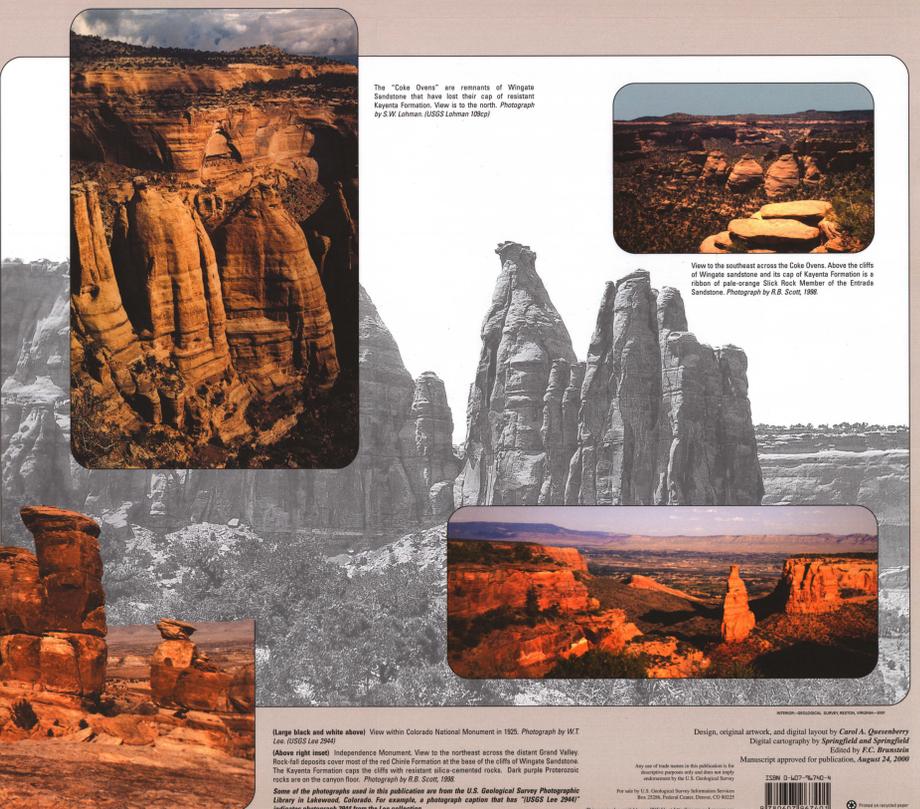
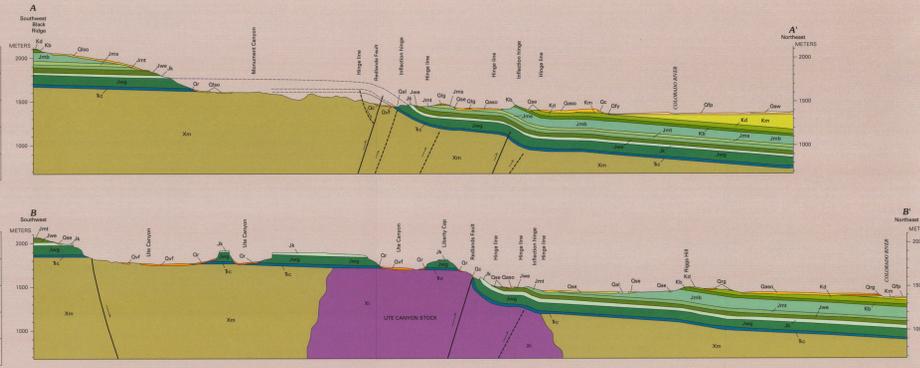
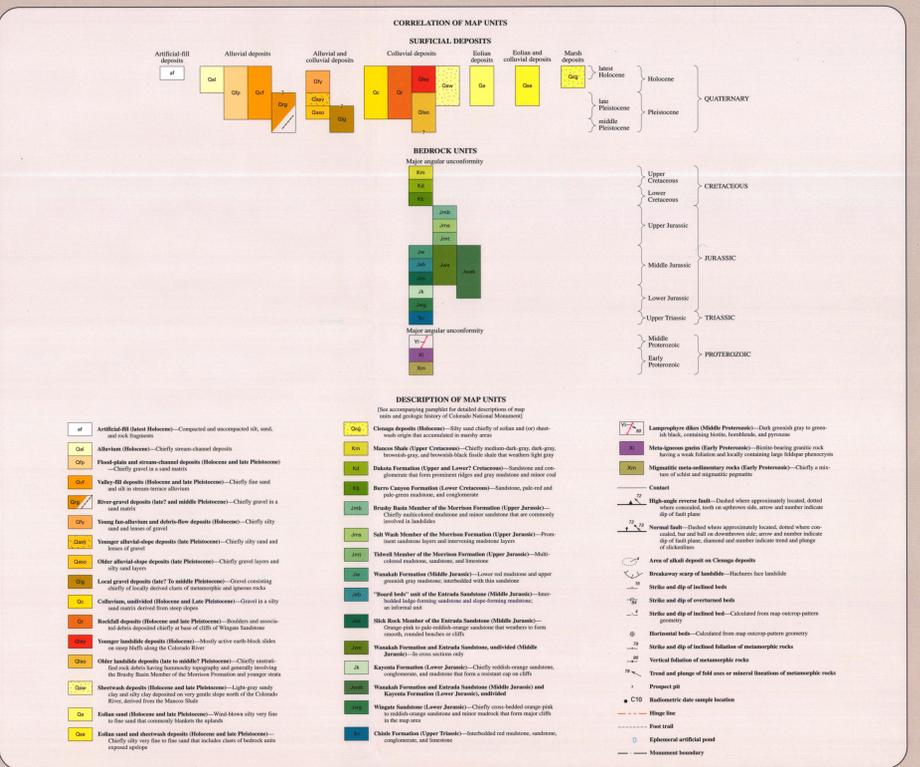
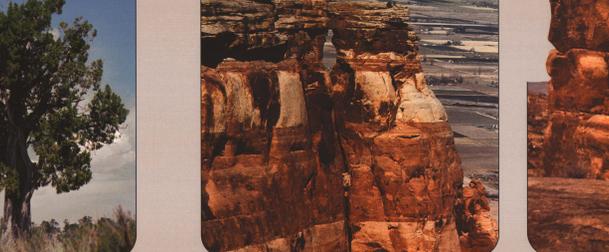
Base modified from U.S. Geological Survey Digital Line Drawings (DLD) Colorado National Monument, Glade Park, 1986. Latest Colorado Geologic Inventory, modified version by R.B. Scott et al., 2001. U.S. version modified by R.P. Dickerson. Latitude of projection origin 39° 00' 00" N.

Revised and updated maps by Robert Scott and William Reed in 1998, map updated by Anne Harding and Robert Scott in 1999 and 2001, re-interpretation of subsurface units by Rex Cole and William Reed in 2000. 1999 inventory of mapographic units by Robert Livaccari in 1999. Interpretation of subsurface units by James Johnson and Ralph Shroba in 1998, 1999, and 2000, early mapping by Robert Dickerson in 1986, and revised DLD map by Peter Buckner, Anne Harding, and Rex Cole in 2000.

## Geology

(Right) Window Rock formed by selective erosion along a crack in the Wingate Sandstone. The resistant capping layers are the Kayenta Formation on pediments of the Wingate Sandstone. View is to the north. Photograph by T.F. Giese, USGS Lohman 1480

(Below) Devil's Kitchen in No Thoroughfare Canyon showing erosional remnants of caps of Kayenta Formation on pediments of the Wingate Sandstone. View is to the north. Photograph by R.B. Scott, 1986



(Large block and white above) View within Colorado National Monument in 1925. Photograph by W.T. Lee, USGS Lohman 2940

(Above right inset) Independence Monument. View to the northeast across the distant Grand Valley. The Kayenta Formation caps the cliffs with resistant silica-cemented rocks. Dark purple Proterozoic rocks are on the canyon floor. Photograph by R.B. Scott, 1986

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The "Coke Ovens" are remnants of Wingate Sandstone that have lost their cap of resistant Kayenta Formation. View is to the north. Photograph by S.W. Lohman, USGS Lohman 1097

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