

LIVING

Revisiting the ever-changing geological wonders of Lewis & Clark Caverns, Montana's first state park.

BY JULIE LUE | PHOTOS BY BRADEN GUNEM

LIMESTONE

LEAVING PARADISE A visitor exits the Paradise Room, the largest and most spectacular room in the caverns. With its great density of fanciful rock formations, Lewis & Clark Caverns is considered one of the most decorative caves in the United States.



over six feet, sometimes looks like he is folded in half. A nimble, gray-haired woman in front of me says, “I’m glad I didn’t wait until I was older to do this.”

Minutes ago, we were hiking through groves of juniper and limber pine outside the mountain. Now we are inside a still, quiet world where the only sound is our hushed voices—kept low so we don’t disturb the bats—and the scrape of our shoes on stone.

On a stormy summer day, my sons and I are taking the Classic Cave Tour at Lewis & Clark Caverns State Park. This is a first visit for my kids and a second for me; I toured the cave as a child on my first trip to Montana. But I remember nothing. My only memories of a cave are from one in the

Ozarks. Or so I believe.

When our group reaches the Beaver Slide, the boys and I wait as the others, one by one, sit on the damp rock and glide out of sight. The slide’s brown, marbled-looking surface is buffed to a gloss by the behinds of countless cave visitors. Its grade is gentle. At a playground, a slide like this probably would be considered suitable for preschoolers, if the preschoolers didn’t mind sliding into the unknown. Peering around the bend, my younger son asks if we’ve taken the more adventurous tour option by mistake.

Suddenly I realize I know what’s at the bottom of the slide. This is the cave I remember, not the one in the Ozarks. Decades ago, I surely polished this same patch of rock with my own backside.

From then on, a feeling of déjà vu accompanies me as we twist and turn through the cave’s rooms and passages—descending a total of more than

500 stairs and ascending nearly 100. Toward the tour’s end, in the Paradise Room, the largest and most spectacular in the caverns, I stand in a spot that feels strangely familiar and stare at wonders I know I’ve seen before.

Some caves are jewel boxes, but this one is a candy shop, packed with fanciful stone shapes in shades of cream and caramel and cocoa. While many retain the classic icicle appearance associated with stalactites and stalagmites, others look like massive wedding cakes, milk chocolate fountains, or half-melted ice cream sundaes. Nearly every patch of rock is decorated as if by cake icing squeezed from a giant pastry tube.

In the 20 years I’ve lived in Montana, I have driven I-90 between Missoula and Bozeman countless times without taking the turnoff for Lewis & Clark Caverns. Standing

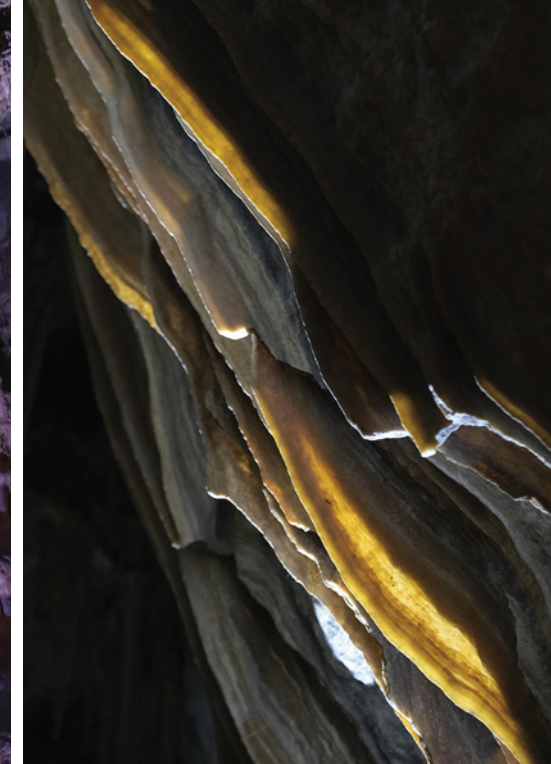
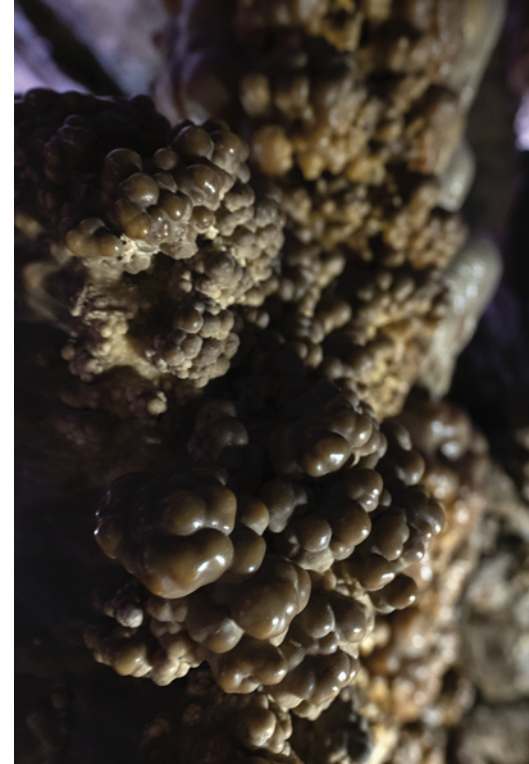
WATCH YOUR STEP Above left: FWP caverns guide Kirsten Rothenbucher shines her flashlight on a potential stumbling formation as visitors enter the Cathedral Room, the second largest in the caverns. Below: A family descends deep into the caverns using the newly installed handrails and lighting system to maintain steady footing. Opposite bottom: Early explorers and visitors navigated the caverns with candles and lanterns, found in the upper visitor center museum. During the park’s special holiday candlelight tours each December, modern visitors can share the eerie experience.



“Don’t think about it and you’ll be fine,” our guide, Erin Young-Dahl, reassures us after explaining that the shadowy abyss to our left is a 90-foot-deep pit. No doubt she’s right, but I still clutch the handrail as I follow my sons down the stairs into Cave Mountain. At least the pit has caught the attention of my 14-year-old, who looks back at me with wide eyes and a nervous smile.

As we wind our way into the chilly caverns, bare walls, ceilings, and floors give way to surfaces that appear to be dripping with limestone. At times, “headache” rocks and other overhanging formations require us to stoop, duck, or waddle. My 17-year-old, at just

Julie Lue is a writer in Florence. Braden Gunem is a photographer in Crested Butte, Colorado.



FREAKY FORMATIONS From left to right: “Cave popcorn,” or globulites, are formed as water seeping from walls flows over preexisting calcite, aragonite, or gypsum crystals, rounding them off into globular clusters; stalactites hang from the cave ceiling next to stalagmites growing up from the floor; “cave bacon,” or layered flowstone, is created by deposits of waterborne minerals flowing along the same route for eons.

here in the Paradise Room, I have to ask myself: What took me so long?

JUST ADD WATER

Of course, what qualifies as a long time in my mind is a mere blip in the cave’s lifetime. The caverns are an estimated 2.5 to 3 million years old, and the Mission Canyon limestone in which they have formed dates back hundreds of millions of years.

Along the trail to the cave, my boys and I find clues to the limestone’s origins. Fossils of marine creatures like crinoids, brachiopods, and corals testify to an ancient shallow sea. Their shells and exoskeletons, rich in calcium carbonate, accumulated on the bottom of the sea and eventually cemented together to form limestone. As the Rocky Mountains rose, the limestone was pushed and folded, creating countless cracks and fissures. Once it was exposed to the surface, the stage was set for cave building.

Limestone, which harbors most of the world’s caves, is easily soluble in water that has been slightly acidified, a process that occurs naturally from contact with carbon dioxide in the air and soil. When acidified rainwater and snowmelt seeped down from above, it filled cracks in the Mission Canyon limestone, dissolving the rock bit by bit, scouring out a maze of passages and rooms. As the nearby Jefferson River cut 1,400 feet into its canyon, the water table

dropped and the caverns drained.

Water still found its way into these air-filled spaces, carrying with it dissolved calcium carbonate and redepositing it, ever so slowly, in weird and wonderful shapes called speleothems. Dripping water created stalactites (which hang from a cave ceiling), stalagmites (growing up from the cave floor), and columns. Flowing water formed stone waterfalls and fragile drapes of “cave bacon.” Seeping water produced lumpy clusters of “cave popcorn,” also known as globulites, and delicate helictites, which curve like the arms of a sea anemone. Even now, where fed by water, these cave formations continue to grow.



OUT OF THE DARK

As far as we know, this spectacular array of speleothems developed in darkness until the end of the 19th century. Native Americans probably were aware of the cave, because on cold days water vapor rises like smoke from its mouth. Yet there’s no sign they entered. And despite the cave’s name, Meriwether Lewis and William Clark knew nothing of the cave when they traveled past while making their way up the Jefferson River in 1805.

But the caverns could not remain secret forever. Ranchers Tom Williams and Bert Pannell found the entrance in 1892. The explorations of Williams and others six years later encouraged miner and investor Dan Morrison to turn the cave into a tourist attraction. Wonders concealed by darkness for millions of years were now revealed by candlelight.

Unfortunately for Morrison, he held no claim to the cave; the General Land Office determined it was property of the Northern Pacific Railway, which donated it to the federal government for preservation. In 1908, the caverns became the United States’ 12th national monument—though with no appropriated funds for development and management and no plan to open the cave to the public (even as Morrison continued to lead unauthorized tours).

Eventually, the federal government gave the land to the state of Montana and agreed



GAZE IN THE MAZE Top: Visitors descend into the Brown Waterfall Room, where a cascade of rock appears to spill from a ledge like a river torrent. In addition to flowing water, limestone formations in Lewis & Clark Caverns resemble flowing lava, melted ice cream sundaes, fountains of molten chocolate, and wedding cakes. Above: Using a fluorescent light to see minerals in a cave rock. Right: A family pauses to photograph the Grand Finale Room toward the end of the tour. The popular spot is part of both the two-hour Classic Cave Tour and the easier hour-long Paradise Tour. Tours run from May 1 until September 30.



to develop the site using the Civilian Conservation Corps (CCC), a Great Depression-era work program for young men. The land was officially transferred in 1937, and a year later Montana's first state park was born.

A NEW LIGHT

At the main visitor center, I catch up with Rhea Armstrong, manager of Lewis & Clark Caverns State Park—one of Montana's 55 state parks. Armstrong, who grew up in nearby Cardwell, has worked at the caverns since she was in college studying to become a teacher. Her family connections to the cave go back two generations.

As we talk, a steady stream of people pass through the doors of the visitor center, built in 2010. This is peak season at one of the West's most notable caves; 70,000 people visit the park each year, and 60,000 of them tour the caverns.

"I think that we've grown faster than we can fully accommodate, but we still want everyone to have the best experience ever," Armstrong says.

To that end, she and her team have been working to improve electrical, sewer, and other infrastructure and services both inside and outside the caverns. The most visible improvement is a new lighting and handrail system, installed in the Paradise Room in 2007 and the rest of the cave during the winter of 2018-19.

This \$1.75 million project replaced potentially hazardous electrical cables and fixtures from the early 1940s, as well as old handrails made of metal pipe. Incandescent lights were replaced with more efficient, cooler LEDs that are less likely to cause algal growth or dry out sensitive cave formations. The new lights also more clearly illuminate the rock formations, including many previously hidden in shadow.

LEDs along the underside of the new stainless steel handrails create enhanced safety and comfort for people touring the cave, according to Armstrong. "The light's not in your eyes, it's down at your feet," she says. "And with more light in the rooms, you're seeing better." The new handrails have been carefully designed to provide the best grip for each location, she adds. "When you're ducking, you need a shorter handrail."

Another major consideration in the light-



DECORATIVE DRIPSTONE Named for its two-toned coloration, Half-and-Half Column rises 30 feet from the floor, making it the tallest column in the caverns.

ing project: aesthetics. Armstrong recalls how the electrical contractor patiently adjusted lighting behind strips of cave bacon until she and park ranger Julia Smit reacted with a "wow." It's a word my sons and I hear frequently from our group.

Like my family, most visitors take the two-hour, two-mile Classic Cave Tour, which includes 600 stairs. (In late December, the park offers a candlelight version.) People with very young children or physical limitations may

instead opt for the hour-long Paradise Tour, which requires only a mile of walking and a dozen steps inside the cave. Those looking for more adventure can take the lights-off, reservation-only Wild Tour, which entails strapping on a headlamp and crawling through tight spaces.

There's also a world to discover outside the caverns. "Because the cave is such a draw, I don't think people realize this is a 3,000-acre park," Armstrong says.



FAMILY FRIENDLY The state park's popular campground fills up early throughout the summer. In addition to 40 campsites, the park offers three cabins and a tipi for rent as well as picnic tables, a playground, and, in summer, guided nature day tours and evening interpretive talks.

BEYOND THE CAVE

Most visitors know about the park's popular campground, with its 40 sites (about half with electrical hookups), three cabins, and a tipi. And many take advantage of the 10-mile trail system, used primarily by hikers in summer and mountain bikers during shoulder seasons (these trails are often snow-free when other area trails at higher

elevations are impassable). But fewer may be aware of the park's historic district, recognized in 2018 under the National Register of Historic Places.

The district features projects constructed by the CCC from 1935 to 1941. Inside the cave, crews carved hundreds of stone steps and blasted a 538-foot exit tunnel. Outside, they built the road, cave access trails, an over-

look, and the upper visitor center, designed in the era's rustic "Parkitecture" style. The workers' skill is especially visible in the closely fitted stonework that makes up several culverts and a beautifully arched keystone bridge (ask park staff for directions).

Their attention to detail also shows in the first building constructed for Montana's first state park, a small stone latrine perched above the upper picnic area. Built in 1938, it's a communal outhouse with "double-seaters on both sides but no stall in between," in Armstrong's words.

WILD THINGS

A trip to the caverns is "really about taking the small moments to enjoy the park and the natural world that we have here, both inside and outside the cave," say Smit, the park ranger. To help people appreciate these moments, interpreters lead programs on geology, history, and the area's diverse plants and wildlife. Thanks to a broad range of elevations, from 4,200 feet at the Jefferson River to almost 6,000 feet atop Cave Mountain, the park supports an impressive variety of habitats.

Assistant park manager Tom Forwood, who leads birding field trips, says roughly

140 bird species have been identified at the park, including two—the black-throated gray warbler and the Virginia's warbler—rarely seen in Montana.

But the park's 10 species of bats are clearly the wildlife stars, featured in talks and tours during Bat Week each August. Seven species have been found in the cave, where guides are careful to ensure that no one is wearing or carrying anything that has been in a mine or another cave. The measures prevent introduction of white-nose syndrome, a fungal disease that has devastated bat populations in dozens of states east of Montana.

During our time in the caverns, my boys and I catch a glimpse of a maternity colony of Townsend's big-eared bats: What looks like a clump of silky brown "puppies" are clinging upside down from the cave wall.

According to Forwood, roughly 25 to 150 bats cluster in the maternity colony in June. In September, most disperse to parts unknown from their summer refuge.

SAFE FROM THE STORM

As long as the lights are on, I feel a sense of refuge in the cave myself. Near the end of our tour, a radio call warns our guide, Young-Dahl, of a dangerous thunderstorm outside. But we hear nothing from the Paradise Room; no crack of lightning or rumble of thunder can reach us. I find myself imagining how rainwater from the storm will eventually trickle down into the cave, each drop making a tiny revision to its architecture.

Young-Dahl gives us a refresher on lightning safety while we wait for the storm to

pass. When another radio call gives us the all-clear, our group hurries down the exit tunnel and into the light. As we jog down the trail, splashing through puddles, I wonder if my sons will return someday, years from now, possibly bringing children of their own. If we continue as careful stewards of this underground wonderland, I know it will still be here, filled with shapes, spaces, and formations that remind us how nature is both timeless and ever-changing. And that we can find life and beauty in some of the world's darkest places. 🐼

Due to the coronavirus outbreak, Lewis & Clark Caverns and other Montana state parks may be closed in 2020 for indeterminate periods of time. Visit stateparks.mt.gov for updates, or call the park at (406) 287-3541.



GOOD BOY Growing numbers of visitors are taking to the park's 10-plus miles of hiking and mountain biking trails. Though not allowed in the caverns, dogs are welcome on the trails year-round if leashed.



WONDERS ABOVE AND BELOW Above left: The park's original visitor center was built by the CCC in the 1930s. It and several other structures were designated in 2018 as a national historic district. Known today as the upper visitor center, it houses a small museum and serves as the park's base for cave tours. Lower left: Taking a selfie at the Grand Finale Room. Above: Heading out the 538-foot-long exit tunnel carved by the CCC.