



# Nature Notes

## A River Forever “Wild and Scenic”

Early morning winds move downstream with the river; its soothing sounds are swept along, too. Today is March 30, 2009. Creatures living in Zion National Park don't mark the date, but continue to pursue their ancient callings of reproduction and foraging for food.

One of daylight's first birds—the Say's Phoebe—gracefully swoops and cries. It's too early in the season to see the large crop of young lizards—Plateau and Desert Spiny—scoot on top of the sand only to stop and give us the eye. If we talk to them, they listen—at least their expressions and cocked heads make them appear to be interested in a reptilian conversation.

Lustrous leaves sprout from mature cottonwoods, and with the gaining onset of tent caterpillars, the tree's annual cycle of defoliation and sap loss begins. Hundreds of pre-pubescent moths start out as black dots inside wide swathes of netted cocoons clipped in at their tips to keep them webbed inside. Before long, these black dots become blue-gray flecked crawlers that drop to the ground, stunned and unsure. Zion's spring crescendo, loud with song and slither and wandering wind, pays tribute to a talented maestro—the Virgin River.

For hundreds of thousands of years this river, with its short reach (154 miles long) and steep tumble (its elevation loss is about 8,000 feet from beginning to end), has given, unhindered, its power, cutting capacity, and gifts of niches and life zones. Historically many other rivers in the United States have not fared so well, particularly those in the East. The Cuyahoga River, which flows through Cleveland, Ohio, is the most infa-



The Virgin River corridor runs from Cascade Falls above Cedar City to Lake Mead, Nevada. Mostly free flowing, it is one of the swiftest rivers in the western United States. Photo by Robin Hampton

mous. A putrid Cuyahoga was a throwback to a time when people held an unenlightened belief that water could dilute any substance poured and thrown into it. Industrial garbage, raw sewage, and animal carcasses gutted Eastern waterways, so in June of 1969, the chemically saturated Cuyahoga caught fire for the tenth time in one hundred years. It was big news because, now, federal government agencies and the general public were more environmentally savvy. It was not acceptable to change water into poison. A literal flare ignited a flame of disgust among local and national communities. Out of the outrage, the Clean Water Act was born.

What the Virgin River has that the Eastern rivers don't are out-of-the-way slot canyons. An inhospitable but stunning terrain means some places are so isolated that getting to them requires skills equal to that of a bighorn

sheep. Canyoneering, rock climbing, and backcountry travel will bring the adventurer to the edge of gaping chasms into which clamor streams, waterfalls, and the beating heart of it all—the Virgin River.

### In Zion, slot canyons protect clean watersheds and micro-habitats.

On March 30, 2009, Zion National Park's modest runlets and the Virgin River—165 miles in all—were designated wild, scenic, and recreational. A decision of this magnitude reflects the remote, undeveloped, and partially accessible attributes of these waterways.

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## What's Flying in Zion?

**American Dipper** (*Cinclus mexicanus*) gets its name from its habit of bending its body from the knees. When alarmed, defending its territory, or looking for a mate, it can "dip" up to 60 times per minute. Visitors may spot this bird anywhere along the Virgin River or in the Emerald Pools. It is easily recognized as it "dips" on the rocks—a behavior that is thought to aid in communicating with other dippers above the noise of the water.

**Black Phoebe** (*Sayornis nigricans*) is easily spotted with its black hood and white belly as it sits on a twig or a branch at the river's edge. A member of the tyrant flycatcher family, it eats insects primarily and exhibits typical flycatcher behavior by flying out from its perch to hawk insects over the surface of the water.

**Great Blue Heron** (*Hyles lineata*) is often perched on the rocks near the diversion dam at Canyon Junction. With its long yellowish bill, it spears fish from the river.

Please don't feed wildlife or approach too closely. Although they look tame because they are habituated to people, they will defend themselves and their young if they feel threatened.

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## What's Blooming in Zion?

**Cardinal Monkeyflowers** (*Mimulus cardinalis*-Figwort Family) are—despite the heat—still monkeying around in the shade and moisture available at Menu Falls and a few other persistent seeps and springs.

**Silverleaf Nightshade** (*Solanum elaeagnifolium*-Potato Family) have been making their stand against the heat of the summer. Like several other members of the potato family, they are poisonous, and they are prickly. Others of their kin are edible (potatoes, tomatoes, and eggplants) or medicinal (henbane).

**Buffalo Gourds** (*Cucurbita foetidissima*-Cucumber Family), also known in perhaps the more romantic language of Spanish as calabasillas, are rampantly taking over along the Pa'rus Trail, their favorite habitat. Those miniature watermelon patterned gourds make them easy to recognize.

Remember, it is against park policy to pick flowers. Please heed signs that say, "Stick to the Trail," and give plants a chance.

# The Secret Life of River Stones

Hiking Wildcat Canyon to Right Fork of North Creek, my ranger friend, Jon, raises a finger to his lips signaling silence. Stopping abruptly, I scan the broad expanse of Navajo Sandstone, dotted with fist-sized iron concretions like a red-spotted toad's raised nubs. Following Jon's line of sight, I search for the anticipated animal: mountain lion, rare bird, perhaps bobcat? "If you're very quiet and they think you aren't looking," whispers Jon, "you can see them moving around and hear them talking to each other." Humored, I realize Jon's mystery animal was not a rare species, but the abundant tribe of round iron concretions dotting the landscape before us. I could easily imagine them, carrying on in a bustle of activity until our human presence rendered them silent and still.

All stones, although not alive, are a foundation of life. Aldo Leopold wrote in *A Sand County Almanac*, "Land then, is not merely soil; it is a fountain of energy flowing through a circuit of soils, plants, and animals." Stones lining Zion's Virgin River remind me of this fountain of energy and the circuit of life created by their many minerals. Along the Virgin, point bars and shoreline deposits reveal stones ranging from tiny pebbles to bowling ball-sized cobbles. All these stones share some of life's building blocks, mainly oxides and minerals, whose elements bond together in unique combinations.

Concretions form when water dissolves and precipitates minerals from Navajo Sandstone, coating the inner surface of air pockets, resulting in an iron marble impregnated in stone. Over time, less-resistant sandstone erodes, leaving a carpet of loose, round, dark nodules. Erosion transports many concretions and other loose stones down slopes, into tributaries, and, finally, on a ride down the Virgin River.

Stone combing, like beach combing, is a discovery tour where sandstones, conglomerates, limestones, and metamorphic rocks splash the riverbed with diverse color, pattern, and texture. Mineral compositions provide a glimpse of geologic, climatic, and life forces in action when each rock was deposited. Rambling the Virgin River at Big Bend, looking at the sea of stones, it's easy to

enter a hidden doorway to the past, like coming across a centuries-old photo album buried in the attic, and spending an afternoon immersed in lives of another time.

At Zion, another time is exactly what stones reveal. From the Mesozoic's 240-million-year-old Moenkopi Formation to recent Cretaceous lava flows, Virgin River stones derive from a smorgasbord of paleo-environments. I imagine the original setting of each stone; a wide shallow sea bustling with fossil oysters; a vast desert with hot

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sand fiercely blown; an oasis of tiny plants and massive dinosaurs on the verge of extinction; a forest of early evergreens destined for petrification; or lava, glowing red as steam jets hiss.

During creation of Zion's Lava Point, vents and cinder cones spewed lava at more than 2,000 degrees Fahrenheit. Eroded downhill

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River rocks support Zion's diverse ecology. Photo by Barb Graves.

# Tracking Zion's River Lumberjack

It's twilight, and calm is spreading through Zion Canyon as the day comes to a close. Meanwhile, my senses are heightened; I'm on the hunt for an illusive rodent. Unlike my predecessors, I'm not looking to make this animal into a fur coat or use its oil for fancy perfume. My mission: capture the mammal. My weapon of choice: a camera.

My prey was once prevalent across the whole country, including Zion, but was trapped to near extinction during the Fur Trading Era. Beaver populations started to increase following implementation of state regulations to protect the species. Records show that beavers have migrated to, and left Zion Canyon, many times since their population rebounded. So what brought the beavers back to Zion? No one knows for sure, but we are happy they chose this sanctuary as a home.

Recent evidence and sightings of beavers in the main canyon started two years ago, and their stronghold has continued to mount;



Sightings of beavers are rare in Zion Canyon, but chewed cottonwoods show their presence. Photo by Robin Hampton

however, for the most part, beavers have been "swimming under the radar." There is the occasional sighting, but often what draws attention to their existence is their harvesting of cottonwood trees. Rodent incisors grow throughout their life, an adaptation geared to support their gnawing behavior. The downed trees provide food and

building materials for dams. I am on the prowl for an abandoned dam and am hopeful that this will lead me to the den and a beaver sighting. The dam creates calm, deep waters in which beavers establish a home. Beavers need deep water so the entrance to their home is underwater at all times, preventing predators, like coyotes, from entering. If the water is deep enough, dam building is not necessary.

The beavers in Zion Canyon are secretive as they burrow into the river bank to create a den, instead of building the traditional wooden lodge for a home. Fluctuation in water levels may prevent our beavers from feeling secure in a wooden lodge that could wash downstream during a flash flood, so they build dens instead. Their dams may also be washed downstream but are more easily replaced and not crucial to beavers' survival.

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***To conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.***

National Park Service Organic Act 1916

***The brook would lose its song if we removed the rocks.***

Wallace Stegner

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over thousands of years, most Virgin River lava stones look like black sponges—full of pits and holes—evidence of hot gases escaping as hot rock met cool air. Black lava rocks, more resistant to the river's erosional forces than weaker sandstones, are abundant in the riverscape, even though the massive Navajo Sandstone far outweighs lava in the surrounding landscape.

When sandstone chunks enter the river-rock tumbler from overhanging cliffs, chemical and physical processes dissolve the glue—primarily iron oxide and calcium carbonate—that fill interstices between sand grains. The river's tumbling action smooths jagged rocks to rounded stones. As stones wear, minerals are released, beginning again the cycle of creating soil, and the circuit of energy continues. If you stop along the Virgin's stonescape and are silent a moment, you might hear particles of newly emerging soil giggling with joy.

*-Barb Graves*

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It also carries forward an attitude of concern for the future welfare of this country's watersheds. Congress and President Lyndon Johnson signed into law the Wild and Scenic Rivers Act in 1968. That year 27 rivers were designated as wild and scenic. By 2008, more than 11,000 miles of 166 rivers in 38 states were so honored. This represents slightly more than one quarter of one percent of America's waterways. Today's new law expands the system by more than 50%; 252 rivers in the U.S. are now listed.

The Virgin River's residents, however, won't understand this piece of significant news. Beavers will continue to dwell in its banks. The spinedace, a native minnow, will flutter in its silty home. From dawn to gracious dawn, the park's waters will rise and fall, a cadence of sweet eternal breath. We may all breathe easier now. Our treasured river, our flowing veins of life, are forever protected.

*-Robin Hampton*

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Beavers are a keystone species in a riparian ecosystem, creating habitats for many plants and animals. It is often their dam building that creates greater diversity within water habitats like those of Zion. The Virgin River's fluctuating water levels and flow rates allow only organisms that have adapted to diverse water conditions to survive. By building a dam, beavers create a calm pool near the turbulent Virgin River, providing calm water creatures with adequate habitat.

As I near the abandoned dam, I document evidence of recent beaver activity. The thick bark of the cottonwood tree is no match for the hungry beaver. The bark and cambium, or sap layer, are the preferred food. Once the tree has fallen the beaver eats the bark off the branches like corn on the cob. Because of their lumberjack habits, beavers have often been viewed as a menace to trees. Biologists in Zion have taken note of their behavior but have also discovered an amazing phenomenon in cottonwood trees. Spring brings new life to the knobby tree stumps. New cottonwood shoots sprout from the trunks, and it appears that the beavers har-



The beaver (*Castor canadensis*) is North America's largest rodent, weighing 40 to 70 pounds when full grown and may reach 3 -4 feet (0.9-1.2 m) in length, including the tail. Image by US Fish & Wildlife Service

vest many of these new shoots. They leave a few, however, that may grow into mature cottonwoods to shade our canyon floor in future years.

Tonight's hunt for the perfect photograph was unsuccessful, as was to be expected. These corpulent animals have no desire to be spotted by humans and clearly want the location of their secluded homes to remain a mystery. Yet their presence here continues. How long they call this canyon their home and the changes that they will create remain to be seen.

The park resource management staff hopes to conduct studies in the future to learn about these elusive creatures and where they dwell, but for now we need your help. As you travel through the park, you can go on your own hunt for Zion's lumberjacks. Grab a camera and head to the Virgin River near the Zion Lodge, the Grotto, or the Watchman Campground. Keep your eyes open for evidence of beavers, and if you do capture one of these creatures with your camera, or you see one, be sure to report it to the Visitor Center or Human History Museum.

-Jennifer Thelen



The Grotto Museum, built in 1924, was Zion's first visitor center. It will now house Artists in Residence. NPS photo

## Sandstone's Stories

On July 31, 2009, the newly renovated Grotto Museum played host to the Centennial Celebration honoring Zion National Park's one hundred year history.

Eighty-five years have passed since this tiny, modest visitor center first opened its doors. Gilbert Stanley Underwood, architect for the "Grand Circle" parks in southern Utah and northern Arizona, designed a simple structure to welcome those with a wandering spirit. His idea of using native stone, crafting it to suit the canyon's landscape, became the groundwork for a new, yet elegant style of architecture—NPS Rustic.

The red, massive stones still await you. Stand before them and let their ancient stories wash over you, whisper to you of the earth's endless change.



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On August 1, 1929, the first issue of *Nature Notes* was published. Written and produced by the Education Departments at Zion and Bryce Canyon, its purpose was to provide information to "those interested in the educational opportunities, the natural history, the scientific features or the scenic beauties of this region." Eighty years later, *Nature Notes* continues this tradition by covering subjects pertinent to Zion National Park and its employees.