



Nature Notes

Rain, Rain...Don't Go Away!

It's a ranger's worst nightmare: a visitor center full of soggy visitors, all complaining about the weather and asking, "It's raining! What are we supposed to do here when it's raining?"

Yet it is also when I get to do what I do best—help people look on the bright side of this "inconvenience." Our annual summer monsoons roll around in late July and last until September. These stormy days come in bursts so folks who stick around for multiple days often get to see both sides of Zion's summer weather, while those with shorter stays see only one facet -- rain or sun.

Most people consider Zion's sizzling sunshine during June and early July to be the norm. True, the early summer months are sweltering here in the canyon. My favorite sight comes mid-July with the arrival of thunderheads. Crowding at the head of the canyon, they slowly creep down, filling the space between sandstone walls with rain, thunder, lightning and chaos.

Showers and thunderstorms are not the only consequence of the monsoons. Come by the visitor center on a rainy day, and you'll feel the humidity as soon as you walk in. Swamp coolers aren't as effective if there is too much moisture in the air. Increased humidity is caused by a reduction in the difference between temperature and dewpoint—the temperature at which water vapor becomes liquid water.

Of course, an increase in rain in and around Zion Canyon also increases the possibility for flash floods. Last year's flash flood of North Creek off the Kolob Terrace Road was monu-



Last summer, the combination of wildfire and heavy rain created a unique result – a black waterfall at the Temple of Sinawava. Photo courtesy of Randy Piggott.

mental, causing some of the worst damage seen in this area in years.

One of the most breathtaking and by far the most scenic of all monsoon effects are the ephemeral waterfalls that appear along the canyon during and after rainstorms. Even early explorers and surveyors commented on the fascinating charm of the canyon in late summer. In 1908, surveyor Leo Snow wrote that "at intervals along the west side of the canyon streams of various sizes rush over the edge of the chasm, forming water falls from 800 to 2000 feet high." Snow clearly visited the canyon just after a rainstorm.

Last year's wildfires on the canyon rims actually created one of the most exceptional dis-

plays of nature. The Virgin River turned black, stained with ash from the fires. Likewise the

The Virgin River may flash but also keep an eye on Oak Creek-it can put on quite a show past the museum!

waterfall at the Temple was blackened by this same mix of ash and water coating everyone and everything up at the Temple – from visitors to shuttle buses – with a thin black layer of wet ash.

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What's Roaming in Zion?

California Condors (*Gymnogypus californianus*) Landing! It's the new--more relevant name for Angel's Landing where numerous condors have been sighted. Kolob Canyons and Lava Point are also favorite hang-outs.

Bighorn Sheep (*Ovis canadensis*) have as usual been making people's days, by creating enticing photo ops. One large herd of twenty plus sheep has been documented, there maybe one less after a wily mountain lion entered the scene...

Mountain Lion (*Puma concolor*) reported in stealth mode, stalking a large bighorn herd. No word on whether a life was lost or not, but the drama of predator vs. prey still dominate the Zion landscape.

Spotted Owls (*Strix occidentalis*) and **Northern Pygmy Owls** (*Glaucidium gnoma*) have breed, hatched and fledged! Silent wing-beats are only perceptible from the cool breeze they produce, but canyoneers, Angel's Landers and others...those are big eyes watching you!

Please remember to take care when driving and pull completely off the road to take pictures.

What's Blooming in Zion?

Prince's Plume, (*Stanleya pinnata*-Mustard Family) is happily finishing off its last few blooms along the Watchman Trail and on the Eastside. Read an article about this hearty soul on page three.

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

White Horsenettle or Silverleaf Nightshade (*Solanum elaeagnifolium*-Potato Family) have been making their stand against the heat of summer and beckoning to the oncoming fall. Agressive and poisonous, like their bretheren, potato, tomatoes and tobacco, they are common in our disturb soil areas, especially along roads!

Remember it is against park policy to pick flowers and in some cases serious illnesses and death may occur due to consumption, touching and sniffing of flowers.

Prospecting for Zion's "Dark Gold"

Shade. I call it Zion's "dark gold." You've heard the expression "black gold," referring to oil? With summer temperatures regularly topping a sizzling 100F degrees, shade—and the trees that deliver it—is an extremely valuable commodity. Everyone wants to find some.

One afternoon, as temperatures soared past 102F degrees, I decided to walk around South Campground to judge for myself which trees make the best shade. My top choice was no surprise. Fremont cottonwoods (*Populus fremontii*)—Utah's tallest deciduous trees which may reach 100 feet tall—provide an abundant shade canopy for most of the camp sites. I've long loved the cottonwood for its leaves that flutter and twinkle with the slightest breeze—the flattened stems at right angles to the leaf base create this effect. Now I look at one of my favorite trees with new appreciation.

Some of the cottonwoods in the campground have a classic flared shape with limbs branching symmetrically from one trunk. The cottonwoods that give the best shade, however, are not so graceful. They lean, or have several trunks dividing close to the ground (one in

South Campground has six trunks); each trunk in turn grows many limbs. This allows the tree to spread in all directions, creating a vast umbrella of shade, often as broad as the tree is tall. This shade allows other less sun tolerant trees a chance at life, creating multiple, overlapping layers of shade and providing the best "dark gold," deep and cool.

Camp sites at the northwestern edge of the

With the longest flight time of any seed, Cottonwood seeds keep Zion coated in "snow" through early summer.

campground are tucked into and often surrounded by a tree known as Tree-of-heaven (*Ailanthus altissima*). The Tree-of-heaven often grows arrow straight with compound leaves spreading like enormous fans; it grows in groves of its own clones of various sizes.

Brought to Zion—from China via the East Coast—by Mormon pioneers to build durable chairs, its rapid growth made it an aggressive

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Fremont cottonwoods providing "dark gold" for one lucky young prospector.

Photo by Amy Gaiennie

Fit for a Prince

“The poison spring is quite clear. The water is sterile, lifeless. There are no bugs, which in itself is a warning sign, in case the smell were not sufficient.”-Edward Abbey

The watering hole described in this section of Desert Solitaire is near the town of Moab. The poison referred to is selenium; the stink, sulfur. Abbey notes the abundant yellow-flowered Prince’s Plume (*Stanleya pinnata*) at this spring, indicating the presence of selenium.

Forty years after publication, and 340 miles across Utah, I find this same plant along the Watchman Trail in Zion National Park. Thinking back to Abbey’s writing I become curious about the source of selenium in the Moenave Formation, which forms the lower part of this hiking trail. I’m looking for poisonous, sterile, lifeless springs, to provide me with a direct analogy to Abbey’s desert oasis. Surprisingly, I can’t find any. Thus, I decide to get to the root of the problem by digging up a little research



Prince’s plume towering over the selenium rich soil it thrives in. Photo courtesy of Arches NP

in the greater Colorado Plateau.

In the upper Colorado River basin, increased selenium levels have been found in rivers and soils accompanying the Colorado River tributaries. Many agencies and researchers have identified the Mancos Shale as the source of selenium in this region. As water percolates through the shale, it mobilizes the naturally occurring selenium, and concentrates the element in the soil. Selenium is leached from the

soils into the river system, which can create hazardous conditions for various life forms. Although selenium is needed for daily bodily functions in humans and animals, large doses of the element can be lethal. Concentration of selenium by migrating groundwater could also be occurring in the Moenave Formation. However, unlike the upper Colorado River basin, water samples at Zion have not shown levels of selenium that are dangerous to humans.

Standing on the red cliff at the end of the Watchman Trail, looking nearly 400 feet down to the Virgin River, it is hard to imagine the migration of single atoms of selenium, drop by drop, through the rock. But, Prince’s Plume acts as a daily reminder that ongoing processes continue to impact ecosystems. Within the upper Colorado River basin, these impacts are occurring today. Only time will tell how Zion and the Virgin River will be affected.

-Tiffany Rivera

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non-native tree. Able to survive air pollution, the shade of other trees, and poor soils, a single mature female tree can produce more than 300,000 seeds, and clones from stumps and root fragments. Releases of growth inhibiting allelopathic toxins give it yet one more advantage over other plants. Its quick ability to produce shade and a nice barrier from the road allow it to remain in South Campground, although a containment strategy is in place with the hope for its eventual removal.

As I was finished my walk, a visitor asked me, “Can you tell me where the best camp sites are? All these have no shade.” “Sorry,” I replied. “We’re all prospecting for Zion’s ‘dark-gold’ and by afternoon, it’s all gone.”

Fremont cottonwood is true “gold” not only for sweating visitors and employees, but for Zion’s wildlife, which use it for shade, shelter, and food. The non-native Tree-of-heaven, on the other hand, has become “fool’s gold.”

-Amy Gaiennie

So, enjoy the summer monsoon season while it lasts. You might feel that your day is spoiled by thunderstorms, but in fact you are witness to a unique and important aspect of Zion National Park. For me, there are few things more fascinating than the day-long buildup of moist clouds above the canyon, and then the rapid release of rain in the afternoon. Relish the break from sunny skies for the next month and if you get a chance, head up canyon during or after a heavy burst of rain. Early explorers of the canyon were awed by the ephemeral waterfalls cascading down the cliffs’ edges and I’m sure you will be, too.

-Katie Raney



Zion National Park
National Park Service
U.S. Department of the Interior

Found something funny and friendly in the park? Seen something silly or sly? Or just plain old got something to say? The interpretive staff, the rest of Zion and I would love to hear it, so send me your submissions or observations! Drop it in my mailbox or e-mail me.

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Thanks to our writers this month; Amy Gaiennie, Katie Raney and Tiffany Rivera!

