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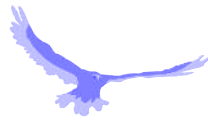
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Wildlife Win: The Colorado Moose

By Matthew Ross 2018

For many years before I moved to Colorado I wanted to see a moose in the wild. I had taken a trip to Maine a few years before moving here and was disappointed to come home without seeing one. Even during my first two years living in Colorado the moose eluded me, and I began to joke that they were becoming my “great white buffalo,” or an animal I would never see in person.

This all changed two summers ago. I was chatting with one of my instructors at Front Range Community College about moose and I asked him if he knew a good spot to see them. He immediately suggested a place up near Cameron Pass along the way to Walden from Fort Collins. I took his advice and the next day I packed up my jeep with my camera equipment and my dog/co-pilot and we headed for the mountains.

Just a brief 15 minutes after turning off Rt.14 we were treated to a bull moose grazing in a meadow. I slammed on the brakes, grabbed my gear and began photographing this majestic animal, and thus began my love affair with this amazing species.

Moose (*Alces alces*), are one of North America's largest mammals and the largest of the deer species. There are four subspecies found in North America, and the smallest, Shiras Moose (*Alces alces shiras*), are what live here in Colorado. The largest of the moose species, the Alaskan Moose, can stand over 6'6" and weigh over 1600 pounds. The Shiras moose weigh in between 800 and 1200lbs and have smaller antlers than their northern relatives. Although our moose here in Colorado are the runts of the subspecies, they are still an impressive animal to be in the presence of.

The moose in Colorado is a story of conservation through reintroduction and has become one of the states biggest wildlife success stories. Since around 1850 and prior to 1978, moose were rarely sighted within Colorado's borders and it was believed the ones spotted were just moose wandering down from Wyoming, possibly looking for new habitat. These moose sightings led wildlife biologists to explore the idea that the moose were coming into Colorado for a reason, and this was the inspiration for their eventual reintroduction.

According to Colorado Parks and Wildlife, 12 moose from Utah were reintroduced in 1978 to the North Park area of Northern Colorado, near the town of Walden. Following this initial reintroduction, over 100 more moose from Utah and Wyoming were brought to Colorado over the next 14 years to continue the increase of their populations. In fact, the initial reintroduction at North Park was so successful that some moose had to be moved to other locations in Colorado, such as the Laramie River Valley.

Today, the moose population is nearing 3000 individuals, indicating that this reintroduction has been an overwhelming success story. Moose have rapidly expanded their range in Colorado can now be found from North Park (also dubbed the moose capital of Colorado) to South Park, Rocky Mountain National Park, west to Steamboat Springs, between Glenwood Springs to Grand Junction and south from Gunnison to nearly the New Mexico border.

CO Parks & Wildlife

It may be hard to believe, but until 20 years ago hardly anyone ever saw a moose in Colorado, let alone hunted one. That's far from the case today. The state's moose populations are thriving, thanks to successful reintroduction efforts by Colorado Parks and Wildlife. Until the late 1970s, only a few stray moose would wander into northern Colorado from herds in Wyoming. These strays were probably just transient animals seeking new habitats, but they never came in large enough numbers to establish a stable population here. Biologists think moose might have been expanding their ranges slowly southward and may have established themselves in Colorado on their own. Wildlife managers and biologists, however, decided to give the moose a boost in the right direction.

In 1978, Colorado wildlife *(Continued on nextpage.)*

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managers arranged for the first transplant of 12 moose to Colorado's North Park region near Walden. These initial moose came from Utah, and, in 1979, another dozen from Wyoming were released in the same region, in the Illinois River drainage. This early population reproduced quickly, and some began to move into the Laramie River Valley.

Before long, North Park's moose population was doing so well that some were moved to the upper Rio Grande drainage. Between 1991 and 1992 about 100 moose from Wyoming, Utah, and North Park were released in southern Colorado near Creede. Since the transplants, our moose have thrived and expanded their range into good habitats. Colorado's moose population now approaches 3,000 animals statewide. Their numbers have grown so dramatically that limited hunting is offered in North Park, Middle Park and the Laramie River area. Not only do the moose provide recreational opportunities for sportspeople, they have also become a main attraction for all who enjoy watching wildlife. In recognition of this wildlife phenomena, the state legislature designated Walden as the "Moose Viewing Capital of Colorado" in 1995.

Unfortunately, having more moose around can present a challenge to motorists and during the Rut, right now... mountain residents and hikers need to be vigilant in avoiding the roaming bulls.

Physical Appearance: Size - Colorado's Shiras moose (*Alces alces shirasi*) are Colorado's largest big game animal with adults weighing 800 to 1,200 pounds. Bulls stand up to 6 feet at the shoulder. Coloring - Their rumps are brown, not white or cream colored as found in deer, elk, or pronghorn. They have white hair on the inside of their legs. Their legs seem too long for their bodies. Their thick, dark brown coat appears black at a distance, and enables them to stay warm in the coldest winters.

Shape - Their long head, overhanging snout, and a pendant flap of skin of varying sizes hanging from their throat ("bell") give moose an unmistakable silhouette when observed in the wild. The bell varies in size and is much larger on bulls.

Antlers - Bull moose grow flattened, palmated antlers with points around the edge, reaching up to 5 feet wide in larger and older bulls. These antlers are shed in early winter and re-grown each year. Yearling bulls sport small spikes or small plates, with antlers increasing in size as the bulls mature. Antler conformation varies considerably, and it is not uncommon to see a bull moose, especially a younger bull moose, with antlers similar to those of an elk.

Mating and Breeding

The breeding season, or rut, begins in mid- to late September and runs through October.

Bulls begin breeding activities by setting up territories, and attract cows by calling with a low grunting sound that resonates across the willow bottoms.

Both bulls and cows are aggressive during the breeding season, with bulls often fighting head to head until the dominant bull drives off, injures, or even kills the challenger.

Cows give birth in May and June. Twins are common in good habitat, and triplets have been documented. Moose may live for up to 20 years in the wild.

Habitat

The term moose comes from the Algonquin Indian word meaning "eater of twigs," and the most common place to find moose is where there is lots of brush for them to browse on. Moose have long legs, which allow them to traverse deep winter snows and thick willow habitat types. In spite of their size, they often go unnoticed as they spend a great deal of time in heavy, dark cover in willow bottoms and forests. Moose can be found in sagebrush, high in the mountains above timberline, as well in the more traditional willow, aspen, pine, and beaver pond-type habitats. Moose are more likely to live in riparian (areas located along rivers, streams, and lakes) habitats with willows, which is their primary food source. They also do well in drier habitats of oakbrush, mountain mahogany, aspen and sagebrush.

If you encounter a Moose while hiking or even in your mountain yard, keep your dog/s inside as they can cause a Moose to become aggressive.

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Ski Colorado

After a long, hot summer Colorado Ski Country USA (CSCUSA) member ski areas are excited to welcome guests back to the slopes for the 2021-22 season. Ski areas have learned a tremendous amount during the pandemic and have adopted many improvements to enhance the guest experience. There are also significant capital improvements in progress at ski areas across the state, with new food and beverage installations, important anniversaries and other improvements making the upcoming season one to look forward to. Ski areas and Colorado Ski Country will release additional COVID-19 information for the 2021-22 season as appropriate as the season approaches and progresses, but guests are encouraged to **Know Before You Go** by checking ski area websites and other channels for the most up to date information on what to expect during their visit. Guests may also visit www.coloradoski.com/covid-19 for tips and information from ski areas across the state.



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Copper Mountain

New for the 2021-22 season, Copper is launching the Western Territory, an area on the resort's western-most side dedicated to inspiring

beginner skiers, kids and families to connect with Copper's history and heritage. This season that will include two new family-friendly adventure zones, two new trails and a connector trail that offer skill development and animation to help inspire families learning the sport. Copper will welcome back free unrestricted parking in the Alpine and Far East parking lots. For more information, visit www.coppercolorado.com.

Echo Mountain Resort

Brothers Grill at Echo Mountain will feature new menu items and the pizza truck has a new home, which will provide more convenient access to the mountain for guests. Guests visiting Echo will need to purchase tickets or season passes in advance. For more information, visit echomountainresort.com.

Eldora

Guests visiting Eldora this winter will not need to make a parking reservation, although single occupancy vehicles will be assessed a \$10 parking charge on weekends and holidays in accordance with Boulder County's sustainable-transportation priorities. Guests can take advantage of the free round trip transportation program offered in conjunction with RTD from downtown Boulder. For more information, visit www.eldora.com.

Granby Ranch

Granby Ranch has greatly expanded its snowmaking capabilities, tripling the acreage with snowmaking to 115 acres for the 2021-22 season, *(Continued on next page.)*

Arapahoe Basin Ski Area

Celebrating its 75th Season, guests can enjoy Arapahoe Basin's new food and beverage venue, Steilhang Hut. Steilhang will serve gourmet, made-in-Colorado sausages, warm pretzels, strudel and German beer in a warming hut with bathrooms. The food will all be handheld so guests can easily go outside to enjoy the view of the East Wall and Continental Divide from the wraparound deck. Arapahoe Basin will also only sell lift tickets online and in advance this season. For more information, visit www.arapahoebasin.com.

Aspen Snowmass

To honor its 75th Anniversary, Aspen Snowmass will be embracing 75 years of creating possibilities with a brand refresh and new logo at Aspen Mountain and Snowmass this year, with Highlands and Buttermilk to follow next year. Visitors can also enjoy the new Alpin Room in the High Alpine restaurant at Snowmass that pays homage to the ski culture and a menu influenced by the Swiss, French and Austrian Alps. Aspen Mountain has undergone upgrades over the summer and fall with the Silver Queen Gondola receiving a new cable and the Aspen Mountain Club being remodeled. For more information, visit www.aspensnowmass.com.

Cooper

Cooper will welcome a new restaurant for winter 2021-22 called Timberline Taproom and Trading Post featuring a sawmill theme and an array of Colorado beers and light fares. Guests can also enjoy a new, streamlined rental and

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providing guests a more consistent and earlier snow surface. Guests will also enjoy greatly increased connectivity as new fiber has been installed over the summer. For more information, visit www.granbyranch.com.

Howelsen Hill

Howelsen Hill has seen significant investment heading into the winter including the new triple chair Barrows chairlift, which will replace the old double chairlift. A new ticket office and concession area will improve the guest experience by offering separate facilities and enhanced concession options. For more information visit www.steamboat-springs.net/131/Howelsen-Hill-Ski-Area.



Loveland Ski Area

New for the 2021-22 season, Loveland will offer Snowcat tours in Dry Gulch, just east of Lift 8, a new guided backcountry experience. The entire snowcat can be booked for groups as well as individual seats. The Loveland Valley Lodge has undergone a significant expansion which will triple the seating available in the cafeteria, expand the rental shop and provide additional capacity at the Ski and Ride school. For more information, visit www.skiloveland.com.

Monarch Mountain

Monarch will increase parking capacity in its Paradise Parking lot by 200 parking spaces and welcome RFID technology to improve guest flow through the chairlift loading process. A new food operation, Shredders, will offer guests a new dining option when visiting Monarch. For more information, visit www.skimonarch.com.

Powderhorn Resort

Powderhorn will continue to make improvements to its state-of-the-art gravity fed snowmaking system, which has allowed the ski area to operate earlier and later into the season. Guests can also enjoy a coffee, treat or pizza from the new coffee shop, Sunrise Coffee & Pizza. For more information, visit www.powderhorn.com.

Purgatory Resort

Purgatory continues to undergo upgrades to the guest experience including improvements to the snowmaking infrastructure, new snow groomers to improve snow surface conditions, modernizing existing lifts with new electric motors and digital drives and thinning and removing trees across the mountain. Snowboarding guests can also enjoy a new Burton snowboard rental fleet. For more information, visit www.skipurg.com

Silverton

Silverton will be celebrating the 20th Anniversary of its chairlift all season long with events and celebrations to be announced throughout the season. For more information, visit

www.silvertonmountain.com.

Steamboat

Phase One of Steamboat's Full Steam Ahead project will be complete for the upcoming season featuring an expanded base area, streamlined arrival process and the realignment of the Gondola to better improve guest spacing and flow. Guests can also enjoy the return of Routtie's in the Torian Plum Plaza serving delicious BBQ. For more information, visit www.steamboat.com.

Sunlight Mountain Resort

Sunlight will welcome several new guest improvements this season including an expanded lower parking lot, six new electric vehicle charging stations, a new website featuring a new online store and new ticketing, season pass and lift scanning software. For more information, visit www.sunlightmtn.com.

Telluride Ski Resort

Telluride will provide guests with 40 new acres of beginner and intermediate skiing including the new Grouse Glades and will welcome a \$1 million upgrade to its snowmaking system covering 60 acres and providing a consistent early season snow product. There will also be new daily direct air service from Phoenix via Denver Air and Houston through American Airlines. For more information, visit www.tellurideskiresort.com.

Winter Park Resort

Winter Park will welcome several new and improved food and beverage options for guests this season. Ember at Snoasis is a new, outdoor woodfired dining facility overlooking Winter Park. Front Range restaurant Stoney's Bar and Grill will be opening a location in the Village this season.

Season pass holders can enjoy Ten Buck Huck- offering a hearty breakfast burrito and a 16 oz coffee every morning. Pop up dining will return in several on-mountain locations and online mobile ordering will also be back for the season.

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HAULING & HARDSCAPES

When Warm Becomes Hot: NASA & NOAA

By Kenneth S. Friedman - Regis University, Denver, CO

This article will appear in the next issue of the world-renown publication The Interdisciplinary Journal of Economics and Business Law (IJBEL) and is printed here with permission.

Recent research by NASA and NOAA (Loeb, N. et al. 'Satellite and Ocean Data Reveal Marked Increase in Earth's Heating Rate,' *Geophysical Research Letters*, June 15, 2021) provides compelling evidence of an acceleration of global warming, showing a 2005-2019 doubling in net global warming to an average of one watt for every square meter on the Earth's surface. The research conclusion is compelling because two very different paths – one using satellite data, the other using a system of ocean sensors – led to the same results.

The conclusion is also alarming, because while global greenhouse gas emissions increased during this period, the concentration of such gases did not come close to doubling. Estimates of atmospheric carbon dioxide, which accounts for 20% of the greenhouse effect, increased about 10% over this period (Lindsey, R. 'Climate Change: Atmospheric Carbon Dioxide,' NOAA, *Climate.gov*, August 14, 2020). Water vapor, which accounts for 50% of the greenhouse effect, has increased by a much smaller amount; cloud cover, about 25% of the greenhouse effect, was little changed; and other greenhouse gases (primarily methane, nitrous oxide, and aerosols) account for about 5% of global warming (Riebeek, H. 'The Carbon Cycle,' *NASA Earth Observatory*, June 6, 2011). The increase in net

energy absorption thus significantly outpaced the increase in global greenhouse gases. The amount of global warming per unit of greenhouse gas has nearly doubled.

This appears to present a significant change from the prior linear relationship. 'Our statistical methods, developed largely by Rohde with guidance from Bollinger, enabled us to extend the record nearly twice as far back in time as had previously been done, to 1753, and that long record allowed us to draw some remarkably strong conclusions...

To my astonishment, the resulting two parameter [average temperature vs. CO2] fit was closer to the data than any of the functions I had tried... it is rare that in science you find agreement as close as had been found by Rohde. The agreement is astonishing...' (Muller, R. *Energy for Future Presidents*, p. 48f.)

The dramatic acceleration of global warming with respect to atmospheric carbon dioxide suggests that something else, other than greenhouse gases, may be accelerating global warming, that we have triggered a positive feedback loop. (What else would explain the sudden sharp increase in the amount of global warming per unit of greenhouse gas?) The danger is that positive feedback loops are, by their nature, not self-limiting, but self-amplifying. Global warming increases some entity, Z, which in turn further increases global warming, which further increases Z. The cycle feeds on itself, the amplitude increasing without limit.

The simplest example of such a feedback loop may be the melting of snow and ice. As (Continued on next page.)

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white, which reflects sunlight, is replaced by darker colors, which absorb sunlight, the planet grows warmer, replacing white with darker colors, warming the planet still further. (Of course, this feedback loop is self-limiting, as there is a finite supply of snow and ice.)

Attention has been paid to the melting of ice sheets in Greenland and Antarctica, in large measure because of their impact on rising sea levels, and in the former case, its potential to devastatingly shut down the bi-stable Gulf Stream. Recently, note has been taken of Antarctica's Pine Island glacier, the largest single contributor to sea-level rise, and with enough ice to raise sea levels by more than eighteen inches. A recent article (*Joughin, I. et al. 'Ice shelf retreat drives recent Pine Island Glacier retreat,' Science Advances 7:24 June 2021*) points out that the glacier is flowing toward the ocean 12% faster than it had just four years ago. And the danger lies not just the rise in sea levels, but also in the replacement of white by darker colors that would accelerate warming.

Moreover, there are other positive feedback loops: the ability of a warmer atmosphere to hold more water vapor (another greenhouse gas that increases global temperatures, with the Clausius-Clapeyron equation indicating that for every degree Celsius, the atmosphere can hold 7% more water vapor), the melting and bubbling to the surface of methane hydrate, a potent greenhouse gas frozen under enormous pressure deep in oceans.

Boreal forests, including 'legacy carbon,' store 30%-40% of the world's land-based carbon. And warmer drier weather makes these prone to more frequent and intense fires, releasing greenhouse gases. 'Zombie,' wintering-over underground peat fires (*Scholten, R. et al. 'Overwintering fires in boreal forests,' Nature 593 May, 2021*), producing methane while they smolder underground in the winter and carbon dioxide when they burn above-ground vegetation the rest of the year, are a new threat in this area, increasing both warming and greenhouse gases.

The thawing of Arctic permafrost releases massive amounts of both carbon dioxide and methane, leading to further warming and more thawing. This vegetation holds an estimated 1,400 to 1,600 billion tons of carbon, nearly

twice the amount of carbon presently in the atmosphere. The annual net release of an estimated nearly 700 million tons (630 teragrams – though with significant uncertainty) of carbon from this permafrost since 2003 may be just one of the positive feedback cycles already triggered (*Natali, S. et al. 'Large loss of CO2 in winter observed across the northern permafrost region,' Nature Climate Change 9 (2019), 852-8*).

We have just discovered, with some dismay, unexpected new emissions from recently uncovered massive outcroppings of ancient limestone (carbonate) rocks (*Froitzheim, N. et al. 'Methane release from carbonate rock formations in the Siberian permafrost area during and after the 2020 heat wave,' Proceedings of the National Academy of Sciences (U.S.) August 10, 2021 118 (32)*).

And it is plausible, just as there are feedback loops we have only recently discovered, that there may be others lurking beyond our present knowledge, waiting to be triggered.

Further south, the deforestation of the Amazon rainforest may convert a major absorbing store of carbon into a source of greenhouse gases. In a vicious feedback cycle, deforestation can trigger precipitation losses that can then trigger dieback, as the rainforest cannot produce enough precipitation to sustain itself (*Amigo, I. 'When will the Amazon hit a tipping point?' Nature News Feature, 25 February, 2020*). Its 100 billion tons of carbon could have a significant environmental impact, were much of it to be released.

The danger is that (i) we have no idea as to what would trigger these feedback loops, where bifurcation, tipping, points lie; (ii) once these loops are triggered, it may be nearly impossible to stop or reverse them; and (iii) for all these loops, we have little idea as to the equilibrium temperature they would generate, whether they would make the planet uninhabitable for humans. The species, then, is facing a threat that is existential, if unquantifiable.

It may seem an inversion of reasonable priorities to discuss considerations of economic risk and reward in the face of a realistic existential threat. Yet in the U.S.

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hydrocarbon producers have long had major political influence, and the mantra of jobs lost in that industry has been cited religiously to defend measures ranging from tax breaks for fossil fuel producers to foreign policy decisions. These arguments carry considerable political weight, even though the renewable energy sector employs many more people than does fossil fuel extraction and refining.

Even considering the domestic political clout of the hydrocarbon-extracting giants, the most intractable impediment to effective action to limit global warming may lie in the developing economies, in which the use of hydrocarbons is increasing rapidly, but which lack the infrastructure (and the capital) to migrate to less environmentally toxic sources of energy. Successfully addressing global warming will require not only that industrialized countries reduce their own carbon consumption, but also that they contribute meaningfully to develop carbon free energy infrastructures in developing economies.

Prospects are not encouraging. In the recent (June 13, 2021) G-7 meeting, the attempt to merely introduce a date by which **these industrialized countries would phase out coal (the common fuel which contributes the most global greenhouse gas per unit of heat produced)** as a source of energy failed. And despite China's impressive leadership in a number of important non-greenhouse-gas technologies, coal still accounts for 60% of its energy.

A dramatic spike in the intensity of storms or in ambient temperatures in influential countries presently reluctant to take the massive action necessary to combat global warming could attract the attention necessary to address this problem in a concerted and urgent manner. For it will require a broad-based incentive to overcome considerable inertia, the tendency to adopt a high discount rate that values present convenience (and profits) at the expense of future catastrophe.

Misgivings about a mere carbon tax

First started in the late 1920s a U.S. organization thrived for more than a decade. Although it was not structured as a legal corporation, it was widely referred to as 'Murder Incorporated.'

From what has been written, that enforcement arm of organized crime appears to have been a highly profitable organization, providing fee-based murder, at least for mob bosses. It is believed to have been responsible for as many as 1,000 contract killings. Yet it provided employment to many who would otherwise have had difficulty finding jobs. And it may have provided a service to society, eliminating unsavory predators.

Despite this public service, society, disapproving of the killing of people, at least the unauthorized extra-judicial killing of people, treated these hit men harshly. It tried, imprisoned, and in some cases, executed them.

This raises an important question that has ramifications

for responses to the continued use of fossil fuels as a source of energy. Why not just institute a Murder tax? If you dispatch n rival mobsters plus m collateral casualties, you (or your organization) must pay n+m times the prescribed per capita murder tax. That would save taxpayers the cost of arrest, trial, incarceration, and would instead generate funds.

Consider something a bit less egregious today. Most countries have punitive laws against driving while intoxicated, even though this does not involve an attempt to murder anyone. Rather than harsh sentences, or even confiscating drivers' licenses, governments could instead impose a tax or even sell a dispensation – akin to hunting licenses issued by U.S. states – minimizing expenses and adding to revenue.

If this seems outrageous, consider a similar scenario. It has long been known that the burning of fossil fuels is a major cause of air pollution, causing asthma and emphysema, which often lead to death.

A recent study, a collaboration of Harvard University, University of Birmingham, the University of Leicester and University College London, (Vohra et al. "Global mortality from outdoor fine particle pollution generated by fossil fuel combustion: Results from GEOS-Chem." *Environmental Research*, 195 (April 2021)) estimated the annual death toll directly attributable to fossil fuel particulates at more than 8.7 million people.

What are the relevant differences that would support a carbon tax, but not a murder tax or a driving-while-intoxicated tax, or even selling licenses to commit these?

If the aim of a system were simply to disincentivize certain types of acts, that could be achieved most efficiently via taxing that act or selling a license. The propriety of a more draconian penalty suggests going beyond weighing incentives and disincentives. It conveys that certain acts are prima facie intolerable, independent of considerations of utility. It is not just a matter of rebalancing incentives (though present carbon taxes, on less than 20% of emissions and estimated by the World Bank's Carbon Pricing Dashboard at \$7.50 per ton, are too low to do even that).

(Continued on next page.)



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If even driving while intoxicated, exposing persons to serious risk, is intolerable, how can we explain our attitude toward something that has been documented to kill nearly nine million people annually?

Two explanations may be pertinent. One is that the killing is done a few at a time and without a readily identified cause that can be easily and immediately traced to the burning of fossil fuels. If a severe smog were to suddenly wipe out the entire population of London in one year, Riyadh the next, Chicago the next, Hong Kong the next, that would generate considerable attention, even if the smog did not threaten to wipe out the species. If fossil fuel combustion were to clearly wipe out whole cities, especially moderately prosperous ones, one at a time, the notion of the propriety of just a carbon tax would lose any semblance of respectability. More decisive action would be demanded.

Yet in keeping with the insights of behavioral economics, the same loss of life, spread out less spectacularly, goes unnoticed.

Another significant causal factor is history/politics. For centuries, fossil fuels have been the major source of storable and transportable energy. They fueled the Industrial Revolution, modern transportation, the computer age. Important sectors of the economy, with significant political influence, have considerable capital invested in fossil fuels, capital that would have to be written off if economies were to change energy sources. These companies have every incentive to use their political power to oppose, or at least postpone, such a change.

In the U.S. this has been carried to an extreme that would be amusing if it were not so disturbing. The governor of Texas, Greg Abbott, recently signed a bill (SB 13) that would require the state, including its \$100+ billion pension fund, to cut ties with any companies that refuse to invest in fossil fuels.

The passage of such legislation, even if only in one state, may serve to underline the even greater political difficulties in funding a commitment to aid developing countries to transition to cleaner energy sources.

A potential cascade of positive feedback loops

The human species presently faces an existential threat, ironically more dangerous because it is developing slowly.

It is widely understood that extrapolating developments over the past decades would extirpate the species. But it is also widely believed, in part because the long-term trends have often been dwarfed by short-term local fluctuations, that we have plenty of time to react to save ourselves (or our descendants).

The danger we face is exacerbated by the fact that the rate of global warming appears to no longer be directly proportional to the level of accumulated greenhouse gases. It now appears to be increasing at a much faster rate.

That suggests that other drivers have been triggered that have caused the rate of global warming to break away from its previous linear relationship with greenhouse gas levels. And these other drivers are causing additional warming that may trigger yet additional drivers, other positive feedback cycles. Temperatures could continue to rise, and even accelerate, even if we become carbon-neutral.

The Geophysical Research Letters article may provide an early warning that we are beginning to trigger positive feedback loops that are independent drivers of global warming. It is a warning that deserves to be taken seriously, providing a compelling rationale for a sense of urgency. That sense of urgency may be necessary to overcome the inertia and lack of political will that has impeded the practical acknowledgment of the immediacy of the problem and the scale of the resources that will be required to address it.

Might it be that the sixth assessment of the Intergovernmental Panel on Climate Change, 'Climate Change 2021: The Physical Science Basis,' despite its grim realism, actually (understandably) understates the gravity of the situation by insufficiently addressing both the risks and the likelihood of positive feedback? It includes the important, if ominous, forecast that 'Many changes in the climate system become larger in direct relation to increasing global warming.' (*B2 under 'Possible Climate Futures'*). But none of its scenarios contemplate the triggering of significant positive feedback, largely because it is so difficult to predict or quantify.

Might this be the last warning we receive? Might we have a final chance to address this slow crisis seriously before global heating expunges our species?

Ken Friedman has a Ph.D. (philosophy of science) & an M.S. (physics) from M.I.T. & an M.A. (philosophy) from Harvard.

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Dear Readers,

Contractors are starting work on the Blue Dot Project, a forest health project on the Roosevelt National Forest near Magnolia Road. For public safety, an area closure is now in effect around the immediate work zone.

This 50-acre project is implementing several landscape-scale Forest Service decisions: the Forsythe II Project (2017), which authorized vegetation treatments on approximately 2,500 acres to meet forest health and fuel reduction objectives; and the Magnolia Non-Motorized Trails Project (2016), which authorized the re-routing of existing trails, creating new trails, closing system and social trails, and converting some portions of roads and social trails to system trails.

Located approximately 2 miles east of the intersection of Hwy 119 and Magnolia Rd, the project will impact several Forest Service administrative roads as well as system trails and user-created trails that serve as portions of the “Boy Scout” or “Dots” Trails System. These areas will remain closed to the public until work is complete.

The work involves thinning densely forested areas to improve the forests’ resiliency to wildfire and selective tree cutting to increase diversity in the age, size, and species of trees across the landscape. Diversity helps make forests more resilient to disease and insect infestations while gaps in the tree canopy promote opportunities for wildfire suppression strategies.

Vegetation will be cut with mechanical equipment utilizing tree shears, skidders, and loaders. Larger material will be temporarily decked and removed from the site.

Smaller logs and slash material will be piled to burn or chip. Piled material intended to be burned will need to cure on site for at least one year.

Some administrative roads in the project area have been improved to facilitate access to the units and hauling of woody material. Upon final completion of the project, the improved roads will be converted to a single track and incorporated into the Forest’s trail system. Some user-created routes were identified in the Magnolia Trails Project to become system trails after the project is complete while other user-created routes won’t be protected.

Crews are expected to be on site for up to 4 weeks, working between the hours of 7 a.m. to 7 p.m. Monday through Saturday.

Home value appeals process affected by mailing error

Boulder County has learned that about 300 property owners appealing home values did not receive their required Notice of Determination (NOD) sent to homeowners in August. This is a small number of the approximately 8,000 property owners who appealed property values and was a result of an issue with a third-party vendor responsible for mailing out the Notice of Determinations. Notice of Determinations are the response to a property owner’s first level of appeal and are an important piece of information property owners need in determining if they should move forward in the appeals process.

If you are a property owner who filed an appeal with the Assessor’s Office, and did not receive a Notice of Determination, please contact us at assessor@boulder-county.org or 303-441-3530. Only property owners who appealed who did not receive the NODs need to contact the Assessor’s Office. Copies of Notices of Determination can be picked up at the Assessor’s Office, emailed, or mailed to property owners. The Assessor’s Office is open Monday – Thursday 7:30 a.m. – 5 pm. Once you receive your NOD, the Assessor’s Office will work with you to ensure you have the opportunity to further your appeal if you disagree with the Notice of Determination.

“While it is only a small number of property owners that are impacted, we want to make sure we reach all 300 property owners that were impacted by this error,” said Cynthia Braddock, Boulder County Assessor. For more info, contact contactassessor@bouldercounty.org, or 303.441.3530.



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Deadbeat Dams & Their Impacts

By Theo Whitcomb High Country News Sept. 8, 2021

As California mulls water storage, a new study adds nuance to cold-water conservation.

As drought-stricken California considers constructing new dams, a new study finds that many of the state's existing structures— despite efforts to prioritize healthy water temperatures— are failing the cold-water ecosystems that depend on them.

The study, published in *PLOS One*, crunched data from 77 cold-water streams across California to characterize their “thermal regime” — that is, their annual temperature fluctuations over an eight- to 12-year period. Salmon, trout and a variety of other cold-water species are sensitive to disruptions in temperature patterns; the temperature range is as important to their life cycle as the amount of water flow. But across the state, the study found, certain dams disrupted these rhythms for up to 31 miles (50 km) of the rivers involved.

In order to protect habitat, water managers deliver cold water to streams from reservoirs. But according to lead author and UC Davis researcher Ann Willis, no one temperature can ensure the health of an ecosystem. For example, the temperatures required for the incubation of

salmon eggs are different from what is needed for the fishes' juvenile growth. “Streams are the temperature they are because of interactions between the water, the trees, the snowmelt and the groundwater creating unique temperature patterns,” she said. “Water temperature is so much more than a single number.”

Willis' research highlights a difficult reality for conservationists: Out of 27 dams, only one successfully duplicated the crucial temperature patterns that the cold-water ecosystems depend on. “In science, when we have results like that, we call it an outlier, which means it's the exception that proves the rule,” said Willis. Dams — even those designed to manage cold-water ecosystems downstream — were overwhelmingly unable to mimic the fluctuating temperature patterns.

Historically, water management has focused on releasing water from dams with a single-degree temperature target, or a seven-day average, to maintain cold-water ecosystems. But this simplifies the temperature dynamics, flattening an otherwise dynamic process and disrupting the seasonal patterns important to ecosystems. In other words, the right temperature isn't always released at the right time.

Scientists and policymakers need to carefully consider thermal regimes when weighing the future of California's water infrastructure and imperiled cold-water ecosystems, said Belize Lane, a hydrologist at Utah State University who was not involved in the study. “They make a good point: We have oversimplified environmental management targets.” But a more thorough study of the complex stream-level dynamics is necessary, Lane said, especially the potential role the state's existing dams play in supporting the ecosystems' temperature needs.

Restoring a dynamic annual temperature pattern is crucial, both for preserving California's salmon and trout — three-quarters of which are at risk of extinction — and for protecting the broader ecosystems that many Californians rely on. Whether that comes with — or without — dams is another question.

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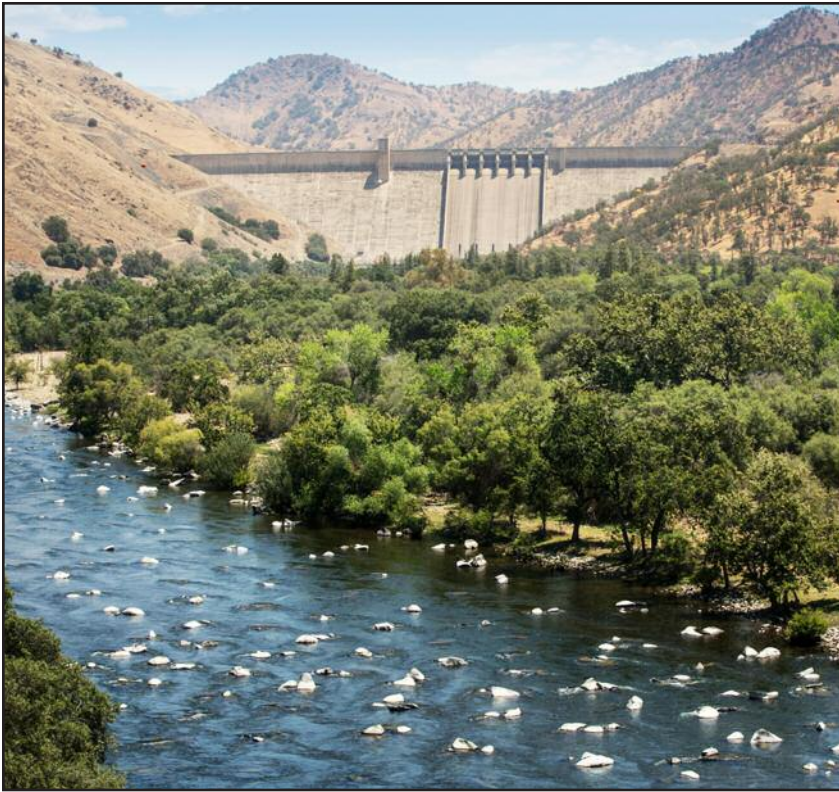
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water releases. The same holds true for temperature, said Willis: Adjustments need to be made to account for the patterns of cold-water streams and the species that depend on them.

Willis said she is not advocating the removal of all dams. She simply believes that we need to be more deliberate about what our water infrastructure seeks to accomplish. As she put it, we need to identify “deadbeat dams” — and remove them if necessary — while improving existing infrastructure as needed. If we want to enhance the ecosystems that so many species depend on, Willis said, we need to focus more clearly on how science informs our goals.

Increased water storage is on the list as federal infrastructure spending winds its way towards California. Willis hopes that her research will give pause to anyone recommending the expansion of the state’s already staggering dam footprint. She also cautions against relying on the existing approach to sustain cold-water ecosystems: “The science doesn’t support that,” she said.



Some argue that dams can help manage cold-water ecosystems in a changing climate by storing and releasing cool water. But Willis said the science is clear: Environmental management needs to move away from oversimplified temperature targets.

Watershed management, as a field, has seen its operational strategies called into question before. After scientists noticed the importance of a varied amount of water flow, managers adjusted the timing and volume of

Pine Flat Dam in Sanger, California, releases water back into the flow of the Kings River after being held in a reservoir. Except for Shasta Dam, no other regulated river in a recent study showed the natural temperature patterns that cool- and cold-water ecosystems need.

George Rose/Getty Images

Theo Whitcomb is an editorial intern at High Country News.

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Getting To The Heart Of The Matter

Colorado State University

COVID-19 is a respiratory illness that can lead to lung failure, requiring some patients to be sedated and placed on mechanical ventilation.

Helping extremely ill patients like this is the motivation behind a new study led by Jennifer Mueller, a professor in the Department of Mathematics and the School of Biomedical Engineering, and a Professor Laureate in the College of Natural Sciences. Mueller specializes in a noninvasive pulmonary imaging technology called Electrical Impedance Tomography, and her goal is to help patients receive more targeted care and have better chances of recovery.

Teaming up with Dr. Ellen Burnham at the University of Colorado Anschutz Medical Campus, Mueller is supported by the National Institutes of Health on a COVID-focused study aimed at proving the clinical relevance of Electrical Impedance Tomography, or EIT. Using an investigational EIT system produced by collaborators at GE Research, Mueller and colleagues are examining the lungs of COVID patients undergoing mechanical ventilation to help doctors make decisions about individual patients' care.

As part of the study, Mueller is also partnering with Dr. Julie Dunn at the University of Colorado Medical Center of the Rockies. There, Dunn will lead imaging of patients suspected of having pulmonary embolism, or a blood clot in the lung, in order to validate EIT for computing ventilation perfusion ratios. These are measures of how well both air and blood are reaching the lungs.

The project is supplemental to ongoing NIH-funded work Mueller has led in collaboration with Dr. Emily DeBoer at Colorado Children's Hospital, in which they've used EIT to image the lungs of patients with cystic fibrosis, spinal muscular atrophy and bronchopulmonary dysplasia. In the cystic fibrosis studies, the researchers used EIT to look for regions of air trapping, which is a major concern for those patients.

In the wake of the COVID-19 pandemic, Mueller received the supplemental NIH funding that allowed her to shift her EIT research to studying COVID patients suffering from Acute Respiratory Distress Syndrome. EIT, Mueller said, could provide doctors with, simple, safe, targeted ventilation and intervention strategies for COVID patients. COVID respiratory distress has posed unique challenges that differ from more typical respiratory problems, so the project aims to give doctors a larger toolbox of personalized care for such patients.

Bringing EIT to the clinic

EIT is not currently used in clinical settings in the United States. For over two decades, Mueller has led pioneering studies aimed at proving out the technology and getting it ready for use in hospitals and doctor's offices. Mueller says the NIH-funded work could pave the way for the first commercial EIT system available in the U.S.

For imaging inside the body, doctors typically use gold-standard imaging like computerized tomography – which involves a large amount of X-ray radiation – or magnetic resonance imaging. Both require expensive machinery and are not suitable in all settings, particularly with children. EIT, on the other hand, is noninvasive, non-ionizing, and provides real-time data.

“Although the resolution of EIT cannot compete with that of CT and MRI,” Mueller said, “the images still provide real-time regional maps of ventilation and perfusion in the lungs. This can't be obtained with any other imaging modality, and you can do it safely and continuously at the bedside, for as long as you want. Any age is fine, including kids and babies.”

Using a new, portable, hospital-friendly imaging platform made by GE Research, Burnham will lead data collection on about 40 patients with COVID-19 at the CU Anschutz Medical Campus. The researchers are seeking to answer several questions, including: Does proning (turning patients

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on their stomachs) help them breathe better and get them off the ventilator faster? Could real-time imaging someday help doctors make more informed decisions on whether a patient is ready to wean off a ventilator?

From algorithm to clinic

Mueller is a mathematician who co-pioneered a reconstruction algorithm called D-bar that forms the basis of her current EIT platform. D-bar is different from traditional EIT algorithms. "Instead of approaching the correct solution stepwise, D-bar goes straight to the solution," Mueller explained. The method allows the imager to directly visualize all or part of a lung and to gather conductivity information like breathing and perfusion maps, rather than having to employ a model simulation.

Mueller has worked in Electrical Impedance Tomography since 2000 when she was a postdoctoral researcher at Rensselaer Polytechnic Institute and worked with Jonathan Newell and David Isaacson, who are pioneers in the technology. She started in this field on the mathematical side working on the D-bar and other algorithms but was drawn toward the clinical applications, with the goal of making a real impact with patients.

"The overall goal of my research is to provide a technology that will truly help doctors treat patients with lung conditions," she said.

After serving as a faculty member for several years at CSU, Mueller founded the EIT lab in 2011. She has continued collaborating with partners at RPI and the University of Albany, as well as with Samuli Siltanen, a researcher at the University of Helsinki with whom she recently co-authored a book about linear and nonlinear

inverse problems. Her other collaborators are at the University of San Paulo in Brazil, with whom she was first funded by the NIH and who helped get her lab at CSU started.

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Previous page top left: *Chanel getting groomed.*

Top right: *Four cats from Sarah Jane.*

Bottom right: *Lawnmowers at work.*

Bottom left: *Lil'bit supervising.*

This page top left: *Chett from Ana Rae.*

Top right: *Donkeys from Donkey Rescue.*

Bottom left: *Wild Turkey.*

Bottom right: *Ruby from Derek.*

Prevention For Snowbirds & Vacations

From Jim Plane – State Farm Insurance

Keep your home safe & secure- home winterization tips for snowbirds to help prevent damage and theft.

Ways for snowbirds to secure their nests while away

If your family heads south for the winter in pursuit of sunnier skies, similar to protecting your home while you're vacationing, take measures to protect and winterize your home so you can enjoy the season away without worrying about what you left behind. An empty house is an easy target for burglars; so don't advertise your absence.

Tips to protect your house while you are on vacation

Have your mail held and stop newspaper deliveries. The post office can hold your mail until you return or you can forward it to your winter location.

Secure windows and doors. Help keep your home untouched by installing secure locks on all windows and doors.

Lighting. Make sure there are bright outdoor lights and time them to turn on at sundown. Set lights on random timers throughout the house to give the appearance someone is home at night.

Create a home inventory. A home inventory can simplify

filing an insurance claim if a burglary or accident does happen while you are away.

Don't advertise your travels. Don't mention your absence on social media and wait until you return to post those travel pictures.

Unplug unnecessary appliances. Unplugging TVs, coffee makers and small appliances helps protect against electrical fires or power surges.

Hide the "hide-a-way" key and disable remote key entries. You won't need them while you are away.

Enlist the neighbors. Ask a trusted neighbor to monitor your property while you're away and to inform you about suspicious activity, collect any flyers that are left on your door and possibly park their car in your driveway periodically.

Snow removal. Hire a snow removal service to take care of your sidewalk and driveway.

DIY home security or alarm services. Some apps connect to your home security system and alert you of changes. Others connect your mobile phone with a security camera or webcam to provide remote surveillance.

Consider shutting off water at the main water valve. Turn water off at the water meter so the water pressure is turned off in the whole house. After turning off the main water valve, flush a toilet or open a faucet to evacuate some of the water from the interior pipes. Also, turn off the water to washing machines and dishwashers to avoid them leaking, and ensure your garden hose is detached.

Problems that start small in an unattended home can get serious if they're not addressed. You can ward them off with a little preparation.

Prevent Frozen Pipes. Add extra insulation around pipes located in the attic, basement or crawlspace and keep the thermostat set at 55 degrees Fahrenheit or above. Also, change the battery in the thermostat. Some thermostats offer remote control so you can check and change your home's temperature while you're away. Install a whole house water leak detection system that will alert you in the event of a leak. You can then schedule service from afar.

Clean gutters and trim trees. Cut down any dead limbs or trees near your house that could fall under heavy snow or ice. Clean all gutters to help drain away ice melt, possibly preventing water from building up and causing ice dams on your roof.

Prevent Pests. Throw out any food not in an airtight metal or glass container. Then empty, clean and defrost your refrigerator and freezer. Also inspect your home's foundation, inside and out, and seal any openings. And make sure your home is prepared with some DIY winterizing tips. Cover windows and repair any old under door foam strips or around the edges of doors or windows.



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A Monsoon Summer In The Southwest

By Jessica Kutz High Country News Sept. 17, 2021

How residents across the region are engaging with the yearly weather phenomenon.

When I moved to Tucson from western Colorado in the fall of 2019, I knew the weather would be warmer than I was used to. But the summer that followed turned out to be the hottest on record. I waited for the promised monsoon to cool things down, but that relief never came. Instead, I sweltered in my swamp-cooled duplex.

Then, in mid-June this year, the monsoon season finally began. When the first rains hit, my partner, a Tucson resident for more than a decade, ran out into the street in our neighborhood to frolic in the torrent. As he pranced under dim streetlights, I worried that this storm would be like last year's — the only rain of the season. What if it was the last monsoon ever? Given our increasingly unpredictable world, I decided to embrace the moment. I ran out, letting the rain soak through my clothes as a rush of water stormed down the street, my feet and ankles submerged in a dirty deluge.

By July, the rain was making regular appearances. It was around that time that I first read about the Southwest Monsoon Fantasy Forecasts, an online game where people cast their monsoon predictions. That month turned out to be the wettest on record. It rained 8 inches in Tucson — the largest amount since the city started keeping track in the 1890s — a tremendous amount compared to the previous year's 1.62 inches, and even to the yearly average, which is


around 6 inches. Intrigued by how erratic the seasons seemed to be — and delighted by the prospect of winning a \$400 backyard weather station that could track everything from wind speed to solar radiation — I decided to give the fantasy forecast a try.

I created a username, joining the ranks of other amateur forecasters with imaginative monikers like “mesquite nerd” and “weather geek.” It was easy to log my guess for the month of August. Each city has its own page, with a bar graph depicting the median and mean rain totals, giving a sense of the usual rainfall. I moved a thick yellow line across the graph, contemplating my best estimates for El Paso, Flagstaff, Tucson, Phoenix and Albuquerque. Should I move the line closer to the right, showing how much I hoped for more rain? Or settle for a more conservative estimate? I imagined other weather enthusiasts across the West doing the same, attempting to make sense of a seasonal weather pattern that doesn't seem to make sense much. I fiddled with my calculations for August and eventually settled on 1.8 inches, the median guess for Tucson. I didn't believe our monsoon luck would continue past July.

But August surpassed expectations again, with nearly 4 inches of rain. I was off, badly off, with my conservative estimate. It was worth it, though: The Tucson Mountains suddenly looked like a scene from Jurassic Park, with rocky slopes giving way to verdant valleys. What was brown and dry was now lush and green, and weeds flourished in the sidewalk cracks in the middle of August. Mesquite trees begin taking over my patio, and *(Continued on next page.)*

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the mosquitos, which multiplied with the rain, eagerly dined out on my arms. But the rain brought problems of its own: While this year's outsized monsoon storms were welcome, they were often accompanied by dangerous flooding that overwhelmed the desert arroyos and washes. Flash-flood notices lit up our phones all summer long in what an announcer at a local indie-movie theater called "a symphony of storm alerts."

Tucson, Arizona. August 17, 2021.

Roberto (Bear) Guerra/High Country News

OVER THE PAST DECADE, the University of Arizona's Climate Assessment for the Southwest program (CLIMAS) has hosted an entertaining podcast about local weather systems. And in recent years, there's inevitably an episode where the usual hosts, Michael Crimmins and Zack Guido, researchers and professors at the University of Arizona, have a back-and-forth about their monsoon predictions. It was that dialogue that inspired them, along with fellow researcher and producer Ben McMahan, to create the monsoon game. "(We wanted) to find new ways of talking about the monsoon that engaged the public, because we know how it's the single season that captivates the attention of people," said Guido.

For Crimmins, it was also an excuse to indulge his



obsession with the monsoon rains. He says his moods are dictated by the season; during last summer's "nonsoon," he cycled through all five stages of grief. "It's kind of like an emotional thing in that I go up and down with the dewpoint temperature," he told me. He spends his days alternating between checking his fancy home weather station — which is similar to the prize that was being offered — and, when he's out, scanning his phone to see if any storms are developing. "I even got it to show up on my smartwatch," he said incredulously. "That's not normal."

The game's main purpose is to educate residents about our regional weather systems. "It's not so much that we think people have some innate ability to know what the weather is going to be," Guido explained. "But we do think the act of thinking about weather and climate is a very useful exercise for a whole bunch of reasons." Monsoon game players are more likely to take their curiosity a step further, researching the region's historical precipitation patterns and trying to deepen their understanding by comparing their own weather hunches to the scientific data.

The monsoons are something that affect us all, whether we realize it or not, because they influence the regional temperatures — and, for those of us with swamp coolers, they either intensify or reduce our personal experience of humidity and heat. "It's kind of like soccer or fútbol for Latin Americans," Guido said. "It's the thing that everybody can talk about, and that everyone loves to talk

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about and you can kind of find common ground.”

The Southwest’s monsoon is driven by a complex host of factors. But at its most basic level, it forms when the land warms up at a different rate than the Pacific Ocean does, causing the wind direction to shift and allowing moisture to travel north from Mexico. Most of the monsoon rains are actually concentrated in Mexico. In the Southwest, we’re on the periphery of the weather pattern. But that still covers a lot of territory: The monsoon season extends all the way up to Colorado and Utah and influences weather across the entire West. Various factors, including the air pressure system known as the Four Corners High and the amount of moisture in the air, aligned this year to give us a “good” monsoon. “Wherever that high-pressure system is, is really, really important,” Crimmins said. “If it is above Arizona and New Mexico, then that moisture is pushed back into Mexico.” This year, it was positioned just right.

That’s why, Guido said, it’s harder than people think to connect extreme seasons — like this year’s remarkably good monsoon, say, or last season’s terribly dry one — to climate change. The dramatic differences between the two seasons represent an anomaly; it’s more likely that future changes from year to year will tend to be much subtler. “There’s so much variability that we would need long

records, and highly dense records, to be able to find the trends in them. And we just don’t have that,” he said. “We know that we’ve altered the amount of energy within our system, and we know that has an effect on the climate system because the climate system is about moving energy around,” he said. There’s a reason the 2021 report of the Intergovernmental Panel on Climate Change avoids making definitive statements about the future of the Southwest’s monsoon. “It’s a \$10 million question,” Guido said.

Throughout the rainy months of summer, for McMahan, the game provoked a kind of internal conflict between his desire to win the competition and the region’s desperate need for precipitation. “I want it to rain a certain amount, but then I kind of want it to stop raining, but I actually don’t want it to stop raining,” he said when we spoke in August. “That cursing kind of talk is not acceptable about the monsoon.”

As of press time, my own guesses have me ranked at 144th place. By mid-September, Tucson’s monsoon season was already the third wettest on record. More than twelve inches of rain has fallen since June. Who could have predicted that?

Jessica Kutz is an assistant editor for High Country News.

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How Wildlife Sightings Create Community

By Ana Maria Spagna *High Country News* Sept. 15, 2021

What we share and what we keep quiet in small mountain towns.

For many years, in this tiny mountain town, we avoided certain signs. Oh, we had trailhead signs and wooden slabs on brush-hidden driveways adorned with family names. But there was an unspoken rule: No signs for political candidates. Even when a neighbor ran for the state Legislature and his face graced fence-line billboards elsewhere in the county, we didn't see many here. Why? There was no need. With fewer than 100 year-round residents in our remote corner of the Northwest, we knew where everyone stood. Or we thought we did. We just didn't want to know. We needed each other too much to risk conflict.

An organic garden in Stehekin, Washington, home of the author. Photo by Andy Porter

Until last year. Everywhere you turned in 2020, you saw signs. On barns, on bumpers, painted on asphalt, dragged by a prop plane. Candidate names and Confederate flags, rainbow stripes and coiled snakes. One

color for the country, one for town. Lines drawn. Curtains closed. The inevitable result, perhaps, of long-suppressed anger.

By the time of George Floyd's murder, tensions ran high. Disputes over masks had moved past clenched-jaw truce to all-out screaming matches. Friendships were lost. When a



few people decided to gather in support of victims of police violence, my wife and I thought long and hard before making a sign. I worried: Would the sign amount to virtue signaling or worse, needling neighbors who'd choose not to attend? What about the unspoken rule? Didn't I care about peace in my community? Yes, but this sign was not for a candidate or an issue. The sign would signal support for people's very lives. I thought about how it would've felt if, a decade earlier, during debates about our love for each other, we'd seen signs of support. It would've meant the world.

We painted a sign, took it to the protest and left it up where we'd gathered along with a smattering of others. Someone took it down. We put it back. Eventually, the sign disappeared. Let me tell you: I was

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very angry.

I moved soon thereafter for a short-term job across the country. Eight months was the longest time I'd spent away in more than 25 years. I returned eager for a new start. Mask mandates had lifted. Election season had passed. Most delightfully: Animals appeared everywhere.

I'd forgotten how wildlife sightings create community. A few years ago, I came upon a wild turkey running between four-foot-high snow berms. Except we don't have wild turkeys. I told the story shyly at a dinner party. I saw it too, my neighbor cried. I saw it, too! Once, midsummer, I came upon a mountain goat walking the same stretch of road. Mountain goats don't visit the valley floor when the temperature's over 90. Not usually. Not ever. I pulled my Tercel next to a Dodge Ram and rolled down the window. Did you see? I asked. Did you? the driver asked. We shook our heads, grinning. One winter, trumpeter swans showed up on the lake. In the post office, ever since, swans dominate every conversation: How many did you see today?

This early summer, we saw more fawns than usual, more rattlesnakes, more bears: a blond with black haunches, a cinnamon yearling, a big black male sitting mid-road in the dark. River otters on a dock. Ermine in the woods. Harlequin ducks riding rapids. Some we learn about secondhand. Four new fisher kits somewhere in the county. Cougar, bobcat, elk and wolverine: camera-caught and ghostly.

Why so many? Maybe the pandemic gave nonhumans silence and space, a chance to reproduce? I doubt that's true. What's new is we're out of the house. We're talking again. There aren't more animals, just more sightings, more casual conversations, more connections. I am relieved.

I am also worried. We've heard rumors of other sightings, animal visitors so unwelcome I dare not name them. If they move among us, what will become of our common ground? We'll have to confront conflict again. We'll take sides and take stands, as our consciences dictate, as we must, and we'll hope the frayed thread between us can hold. After all, fire season is now upon us, when we need one another more than ever.

Meanwhile, a small fawn hops on spindly legs, skitters down the road, and trails its mother into dense brush. Keep moving, I think: grow stronger, outwit predators, avoid hunters. Nothing's easy for this tiny unspeakably beautiful creature. I look around to see if anyone's sharing the moment: Did you see?

This time, it's only me.

Ana Maria Spagna lives in Stehekin, Washington and is the author, most recently, of

Uplake: Restless Essays of Coming and Going.

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Photo by Alexa Boyes.



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Update: BuffaloFieldCampaign.org

Summer Wanes and BFC Calls for Winter field Season Volunteers!

Long summer days grow shorter at BFC headquarters on the shores of Lake Hebgen but most days still glow warm, bright and full of life. Morning frost will coat the sagebrush soon, the first signal that winter is coming. Yellowstone's wildlife, healthy and active, grows strong on the fruits of the landscape.

The strongest bull buffalo of the imperiled central and northern herds emerge victorious from the rut, winning the right to pass their strength on to the next generation of the last wild buffalo. Future calves will need this fighting spirit of their ancestors to survive. Moms continue to look after the yearling calves, teaching the tools to evade predators, find food, and survive the long Yellowstone winter.

BFC's summer outreach and education comes to an end and we celebrate all of the great things our team accomplished this summer. Thousands of Yellowstone National Park guests were educated about the grim reality of government mismanagement of the last wild buffalo herds. BFC volunteers and interns learned activism, policy, and public speaking skills to advocate for the buffalo to Yellowstone's visitors and their home communities. We attended events as far away as Nevada to spread the word about threats to the Yellowstone herds to large and diverse audiences. We distributed our annual newsletters to businesses and people all over the Greater Yellowstone region, giving thousands the opportunity to learn and take action with BFC to protect wild buffalo.

We also launched a strategic partnership with Buffalo Brew Coffee, a fair trade coffee roaster committed to our growing regenerative movement. Check out our calendars and Roam Free Roast on our website. We thank our staff, volunteers, and most of all our dedicated supporters who make summer outreach and education possible!

Now, our team looks forward to winter. September was the time to cut, stack, and winterize BFC headquarters for our winter field season standing with the buffalo. We are hoping to get a new roof on our main lodge as well as re-mortar our front stone steps, an original feature of our historic lodge. The hard work of preparing firewood pays off every time we feel the warmth of the stove after a long day of patrols watching the sacred migration of the buffalo.

After a year and a half without volunteers due to the covid-19 pandemic, we are cautiously optimistic and hopeful to fully reopen our winter field season volunteer program from November to the end of May. Our volunteers



are the lifeblood of the campaign, each new volunteer brings new passion, ideas, and talents to protect the last wild buffalo. Field season volunteers conduct daily patrols on the boundary of Yellowstone National Park, acting as watchdogs, protectors, and advocates for the Yellowstone buffalo herds as they follow their ancestral migration paths. All adventurous spirits are welcome to apply! If you are interested in volunteering this winter or have family or friends who can volunteer visit our volunteering webpage or email volunteer@buffalofieldcampaign.org.

BFC's 2022 calendars are in stock and ready to order! Our wild bison of Yellowstone country calendars display 12 beautiful pictures that capture the life of the buffalo through the changing seasons, and also feature fascinating buffalo facts. These calendars are wonderful additions to the home, office, or school, and are a great way to share the beauty of wild buffalo with those around you and as holiday gifts.

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Yukon To Yellowstone ~ SST Jets

Dear EarthTalk: Whatever happened to the Yukon to Yellowstone (Y2Y) wildlife corridor dream that was in the news years ago? *Jos. Meredith, Bozeman, MT*

Conservationists' dreams of a wildlife corridor stretching from the Yukon to Yellowstone (Y2Y) where "charismatic megafauna" like bears, wolves and caribou can roam freely and have enough continuous undisturbed habitat to thrive is slowly becoming a reality thanks to the dogged determination of thousands of concerned individuals and over 450 partner groups behind them. Since the project's inception in 1993, green groups, indigenous groups and government agencies have worked together to preserve upwards of 500,000 square miles of the inter-mountain west for this project, with hopes of adding much more.

The core of Y2Y is all within the Rocky Mountains, the eastern edge of the Rocky Mountain Trench in British Columbia, and the Liard Plateau in northern B.C. Scientists

have collaborated as well to expand Y2Y into the Greater Yellowstone Ecosystem, the Columbia Mountains of eastern B.C., the Mackenzie Mountains of the Northwest

Territories and the Yukon, given their similar ecological characteristics.

Unlike other animal crossings, Y2Y is a large area across mountain ranges without a hard boundary. Since natural ecosystems are entirely interconnected, conservationists have drawn soft, flexible boundaries in conjunction with evolving patterns of seasonal movements by wildlife. These

untouched areas serve as safe highways for the diverse range of species to feed, breed and migrate without outside interference.

In other sections of the Y2Y region where development has been more commonplace, partner groups have worked to create wildlife-friendly infrastructure to facilitate crossings of roads and other man-made obstructions. They have also set up tracking mechanisms for some species to monitor their success. Meanwhile, other partners have been focused on acquiring real estate parcels that can be left in a natural state or converted back from development to be included in the animal-friendly network of corridors.

In the Y2Y region, conservationists and scientists have focused on the preservation of grizzly bears—an "umbrella" species. Since grizzly bears roam such an expansive area of land in search of food and mates, they play a central role in maintaining the healthy functioning of an ecosystem. Given the population declines and genetic diversity loss of the region, conservationists have especially pushed for wildlife corridors to alleviate the habitat loss and fragmentation among grizzly bears.

Achieving the Y2Y vision has not come easy. Much of the region stretches across private lands. To accommodate



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both humans and wildlife, conservationists have worked with private landowners to ensure safe passage for wildlife without interrupting human lifestyles. Many oil, gas and mining projects also require access roads, which often cut through natural landscapes and degrade wildlife habitat. While the Y2Y mission has come far in preserving the natural environments from Yellowstone to Yukon, the initiative calls for further collaboration from diverse communities. Whether it's volunteering from local groups or partnerships with larger organizations, Y2Y aims to continue its vision of harmonizing a wild and wooly 2,000-mile swath of the North American West.

EarthTalk® is produced by Roddy Scheer & Doug Moss for the 501(c)3 nonprofit

Dear EarthTalk: Are the new SST jets friendlier to the environment than the SSTs of the 1970s? —P. Barnes

Nearly 20 years have passed since the last flight of the Concorde, the first supersonic passenger-carrying commercial airplane (or supersonic transport, SST). The aircraft cruised the Queen of England and the ultra-wealthy across the seas at Mach 2 speed, or 1,350 mph, while soaring at an altitude of 60,000 feet. In 1996, the Concorde achieved its fastest flight from New York to London in under three hours. Now a new wave of supersonic flight may be on the horizon with the recent partnership between United Airlines and Denver-based Boom Supersonic. In June 2021, United Airlines announced plans to purchase 15 of Boom Supersonic's first commercial supersonic jet, the Overture. Boom plans to engineer the Overture to fly up to 88 passengers at a speed of Mach 1.7, or 1,300 mph, at 60,000 feet. Most flight times will be cut nearly in half: Traveling from Paris to Montreal will only take three hours and 45 minutes instead of the usual eight and a half hours; a trip from San Francisco to Tokyo take just six hours rather than the usual 10 hours and 15 minutes.

Boom and United plan a modern, economically-viable, ecologically-sustainable version of the old Concorde, which was "a ludicrously expensive environmental disaster," according to the International Council on Clean Transportation. "It helps to remember that we're talking literally about 1960s technology," Boom Supersonic's Founder Blake Scholl told CNN Travel. "So much has changed."

In collaboration with Prometheus Fuels, a California-based company, Boom plans to design a 100% carbon-neutral plane powered by sustainable alternative fuels. The company claims that Prometheus' technology is able to economically remove CO2 from the air and use renewable, clean electricity from solar and wind to turn it into jet fuel. After successfully running their XB-1 test engines with a blend of more than 80% sustainable aviation fuel, Boom has confidence that sustainable fuels can safely be used in flight. If all goes as planned, the Overture may be flying passengers as soon as 2029.

Virgin Galactic is also throwing its hat into the ring of supersonic commercial air travel. In August of 2020, the company unveiled plans to collaborate with Rolls Royce in developing sustainable commercial high-speed aircraft capable of an astonishing Mach 3, or approximately 2,300 mph. The smaller-scale aircraft will hold 9-19 passengers and utilize state-of-the-art sustainable aviation fuel and "other sustainable technologies and techniques." Aerion Supersonic, which publicized plans last year to build a \$375 million manufacturing facility at Florida's Orlando Melbourne International Airport, also expressed its commitment to having carbon neutral emissions and designing their aircraft to run on 100% sustainable aviation fuels. However, due to financial challenges, the company announced in May 2021 that it will not be able to move forward with the facility at this time.



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A Single Thread In The Tapestry Of Life

By Frosty Wooldridge

The mystique of bicycle travel fascinates most people. Why would anyone “endure” the pains of providing their own locomotion via pedaling rather than the comfort and speed of a car, boat, plane or train? The answer lies in the antiquity of “pedaling bliss.” It thrives in the meshing of your energy with the vivacity of the universe. It rushes into the secret corners of your mind to explore the world on your own terms. Too much comfort leads to tedium or the indolence of life. Once you swing your leg over the saddle of a bicycle, a whole new mental, physical and spiritual dimension opens to every cell in your body. You “fly” at the “perfect speed” with a comet’s tail of memories following you into eternity.

On a bicycle tour through the enchanting history of Europe, my friend Gary and I sweated our way into the Italian Alps. We pushed our bikes around hairpin curves,



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through boreal forests and across mountain ramparts. At Sluggin Pass, we coasted 37 kilometers along a winding, violently descending mountain road that carried us through dark tunnels that led into bright sunshine and flowery Italian meadows.

Ancient Roman ruins dotted the landscape. At lower elevations, 1,000-year-old stone homes housed farmers who worked the land. At the bottom of the Alps, we entered Lago Como (Lake Region) for a ride south into the enchanting land known as Tuscany. If you watched the movie *Under the Tuscan Sun* with Diane Lane, you felt the romance of that vineyard-filled region of fine wines and superb dining.

When you travel through Italy, you travel back in time to walled-cities that protected their inhabitants from the constant charges of competing armies from other towns. Whether you travel through Sienna, Cali-val- Delsa, Florence, Naples or Rome—all those



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cities once featured or still maintain thickly layered brick ramparts surrounding their main living and commerce areas. And always, each walled-city features an ancient, marble church with tapestries, paintings, stained glass windows and stunning architecture.

One night, we pedaled through a hilly region of Tuscany until we reached a river with a hill that swept upward. "Let's bed down up on that ridge after we take a bath in the river," said Gary. "Roger that," I said.

Upon washing the day's grime off our bodies, we walked the bikes up the hill about 150 feet above the highway to a flat spot. We pitched the tents, cooked dinner and watched the night sky reveal millions of twinkling stars.

Next morning, we pedaled along the same road until, in the distance, we discovered a walled-city perched high on a hill.

"Let's check that one out," said Gary. "I'm with you," I said.

We pedaled through woods and fields until the road spiraled upward toward massive 150-foot-high brick walls over 1,500 years old. Along the way, we passed a small abandoned chapel where a work crew repaired furniture. We stopped to see old paintings and statues along the

church walls. Those repairmen didn't think much about working with artifacts and antiquities from centuries ago.

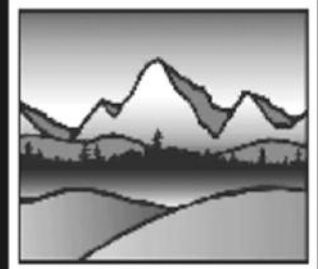
Finally, after sweating up the road, we reached the massive 20-foot high wooden gates of the city. They hadn't been closed for a hundred years or more. Once inside the city, we stopped at a water fountain to fill our bottles and splash cool liquid onto our faces. Around us, shopkeepers and patrons walked along the inside of the walls. A few kids pedaled their rusty bikes as they stared at us. About 100 feet from the fountain, a gray, marble cathedral soared toward the sky. At the top, stained glass windows perched atop beautiful carved frescos.

"Do you hear kids singing?" I asked Gary. "Sounds like a children's choir inside that cathedral with someone playing a guitar," he said. "Let's check it out," I said.

We walked up the marble steps of the church. "Look at these steps," Gary said. "They're worn down an inch at least from the centuries of worshipers coming to church. Generation after generation for over 1,500 years. Man, this is living history."

We entered the church to sit in 1,500-year-old wooden pews that sat 100 people. In the front, about 20 children and a guitar player practiced their songs in Italian. Their young voices mesmerized us. *(Continued on page 33.)*

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For the next half hour, children's voices carried like musical chariots across the inner chamber of that ancient church. The sun shone through the stained glassed windows like colors from a double rainbow. The scent of history permeated every painting. Gray marble columns rose 150 feet over our heads. A stunning statue of Christ hung from a cross with blood dripping down his hands and body.

For the next 30 minutes, we sat in sublime joy with Italian songs floating through the air. We couldn't understand the language, yet our hearts and spirits felt their beauty.

While my bicycle carries me into magical moments on this planet, that day in the cathedral with a children's choir lifting their voices to the heavens must be one of the most sublime moments of my lifetime. Afterwards, we thanked the children with, "Grazia" and "Molto bene" (exceedingly good) from our limited Italian language talents.

Back into the sunshine of the day, we remounted the bikes for our journey through the enchanting countryside of Tuscany. I thanked Gary for his friendship. I thanked the children for their voices. I thanked my lucky stars to bear witness to the beauty humanity offers in music, spiritual quest and architectural beauty.

On our touring bikes, we added another thread into the tapestry of our lives. *Population-Immigration-Environmental specialist: speaker at colleges, civic clubs and high schools.*

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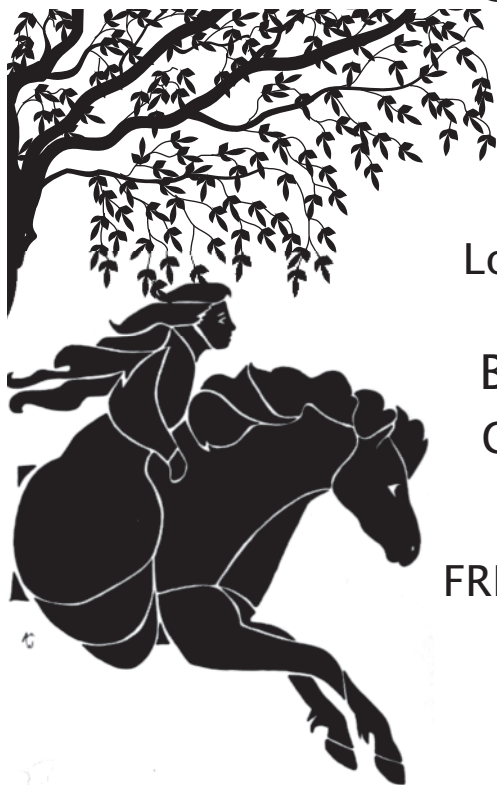
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ART

The Silver Horse - pg 28 303.279.6313
The Rustic Moose - pg 28 303.258.3225

AUTOMOBILE

Carl's Corner pg 17 303.642.7144
Kysar's Place pg 12 303.582.3566
LEGENDS Auto pg 28 720.366.0279
Mountain Muffler pg 27 303.278.2043

BUILDING/CONSTRUCTION

ACE Indian Peaks Hardware pg 16 303.258.3132
Arrow Drilling-pg 25 303.421.8766
Grate Contracting pg 32 303.579.9519
Kape Roofing & Exteriors ins cov 303.922.7663
Peter Palombo, Surveyor-pg 17 720.849.7509
RedPoint Construction pg 22 303.642.3691
Steel Structures America ins cov 970.420.7100

BUSINESS SERVICES

Graphics Galore pg 17, 33 303.642.0362
Karen Schwimmer, CPA pg 14 303.642.0628
Wondervu Consulting Serv. pg 31 303.642.0433

CHIMNEY SWEEPS

Chimney Service of CO pg 14 720.515.0416
MidTown Chimney pg 30 303.670.7785

CIGARS

Foss Company pg 3 303.963.5693

CLOTHING

The Rustic Moose - pg 28 303.258.3225

COMPUTER SERVICE & REPAIR

Wondervu Consulting Serv. pg 31 303.642.0433

DRIVEWAYS/ GRADING SERVICES

Benchmark Land Care pg 8 303.485.1001
Rock Creek Civil, LLC pg 21 720.583.4555

ELECTRIC

United Power - Inside back Cover 303.642.7921

ENTERTAINMENT

Octoberfest Sat. Oct. 9th CCCIA pg 5
Jaime Mezo - Scuba - Cozumel pg 31
KGNU Radio pg 22 303.449.4885

ENVIRONMENTAL

TEG - tegcolorado.org

FARRIER

Forbes Farrier Service pg 10 303.642.7437

FIREWOOD & FOREST MANAGEMENT

High Timber Mtn Tree Serv. pg 15 303.258.7942
Lumber Jacks - pg 11 720.212.1875
Pruins Pruning/Tree Care pg 29 303.653.7967
Rock Creek Civil, LLC pg 21 720.583.4555

GIFTS

The Silver Horse - pg 28 303.279.6313
The Rustic Moose - pg 28 303.258.3225

GROCERIES

B & F Moutain Market pg 24 303.258.3105
Golden Poultry & Meats pg 23 720.697.0508

HEALTH & FITNESS

Hands, Hoofs & Paws pg 9 303.503.6068
Clarity Water Services pg 22 303.717.9110

HOME IMPROVEMENT

ACE Indian Peaks Hardware pg 16 303.258.3132
Benchmark Land Care pg 8 303.485.1001
Grate Contracting pg 32 303.579.9519
Independence Roofing pg 3 720.399.0355
Kape Roofing & Exteriors ins cov 303.922.7663
Pruins Pruning/Tree Care pg 29 303.653.7967
Redpoint Construction pg 22 303.642.3691
Rock Creek Civil, LLC pg 21 720.583.4555

HORSE BOARDING

Rudolph Ranch, Inc. pg 10 303.582.5230

HORSE TRAINING

Timberline Sporthorses pg 13 720.999.7235

INSURANCE

Jim Plane-State Farm- pg 20 720.890.5916

LIQUOR

Foss Company pg 3 303.963.5693
Underground Liquor pg 15 303.582.6034

MUSIC LESSONS

Piano & Harp in CCC pg 9 303.642.8423

PROPANE

Carl's Corner pg 17 303.642.7144

REAL ESTATE

Byers-Sellers Mtn Properties pg 26 303.642.7951
Mock Group-Kathy Keating -Back cov 303.642.1133

RETAIL

ACE Indian Peaks Hardware pg 16 303.258.3132
B & F Moutain Market pg 24 303.258.3105
The Silver Horse - pg 28 303.279.6313
The Rustic Moose - pg 28 303.258.3225

REVERSE MORTGAGES

Universal Lending Corp. pg 7 303.791.4786

ROOFING

Independence Roofing pg 3 720.399.0355
Kape Roofing & Exteriors ins cov 303.922.7663

STEEL STRUCTURES

Steel Structures America ins cov 970.420.7100

TAXES

Karen Schwimmer, CPA pg 14 303.642.0628

WATER & WELL

Arrow Drilling pg 25 303.421.8766
Clarity Water Services pg 22 303.717.9110

Power Update

October
2021

October is National Co-op Month

United Power is an Essential Partner in Local Communities

Cooperatives are more than a local business. Not only do they provide the same products and services as their for-profit counterparts, they also go beyond the business, placing great emphasis on community involvement and the flourishing of its members. Without the members we serve, there would be no United Power. We're invested in making each and every one of our communities the best version of itself and empowering our members to be a part of that vision.

This October, United Power invites our members to join us in honoring National Co-op Month, a celebration of the commitment cooperatives have for their communities and members. There are more than 64,000 cooperatives stretching across almost every industry that touches our daily lives, and more than 800 of them are local electric co-ops. Electric co-ops provide power to nearly 60% of the country's landmass, maintain more than 40% of its distribution grid – approximately 3 million miles of line – and serve more than 40 million members across 2,500 counties in 47 states.

Birthered out of the hard work of our members more than 80 years ago, electric cooperatives were established to deliver power to parts of the country larger investor-owned utilities had no interest in serving. When co-ops were formed to deliver power to these rural communities, they also made a commitment to serve and strengthen the communities within their service territory through investment in the economy, supporting local nonprofits and developing future leaders.

United Power works closely with its communities to support them directly and indirectly. It maintains close relationships

with locally owned and operated businesses. Employees serve on the boards of local nonprofits, chambers of commerce, economic development councils and more.

The cooperative's commitment to its communities and members was on full display over the past 18 months of the COVID-19 pandemic. From temporary suspension of disconnects to contributing \$550,000 to the Co-op Cares Fund to provide direct support to members affected throughout the pandemic, United Power put its words into demonstrable action. It established the Member Choice Grants program to help the cooperative direct support to areas members care about and Operation Round-Up, a voluntary member-funded organization supported by the cooperative, went above and beyond to provide additional assistance to area nonprofits where it was needed.


United Power also continued to provide thousands of dollars in scholarships to area seniors pursuing a post-secondary education and sponsored dozens of virtual community events while in-person events were not possible. When community events did return this summer, the cooperative played a vital role in making them happen, including fairs, festivals and local movie nights and celebrations.


While some electric cooperatives remain small and rural, others have outgrown their rural roots. As communities have grown from rural farming communities to suburban commuter communities or even urban centers, so has United Power's commitment to those communities. No matter where you live or how you use electricity, you can count on United Power to provide safe, reliable and affordable energy and to make serving you its priority.




Payment Methods

As your cooperative, United Power is focused on meeting your needs. We offer our members a variety of easy-pay solutions, in addition to our Coal Creek payment kiosk. Members may make payments in the following ways:

 United Power members can easily manage their accounts 24/7 using our free online payment portal, SmartHub. Pay your bill, store payment methods, view usage history and more.

 AutoPay is a hassle-free way to make sure your bill is paid on time every month. Once enrolled, United Power will deduct your payment on its regular due date from the account you designate.

 Pay your bill quickly and easily with United Power's Pay Now feature. No login, password or registration required. Make a payment using only your account number.

 Pay by Phone allows you to pay your bill anytime of the day through our automated system with your account number and payment method at 866-999-4485.

United Power Coal Creek Office
5 Gross Dam Road | Golden, CO 80403

Member Services: 303-637-1300
Coal Creek Office: 303-642-7921



Payment Kiosk Location



EV Charging Site (CHAdemo, CCS/SAE)



www.unitedpower.com

**UNITED
POWER**
Your Touchstone Energy® Cooperative 

Octoberfest Celebration

Sat. October 9th, 5pm – 7pm

CCCIA HALL 31258 Coal Creek Canyon



24 Ronnie Road

Panoramic Divide & City Lights Views
3 BD/ 3 BA 2,432 sq.ft. .95 Ac. **\$699,900**



NEW LISTING

11017 Circle Drive

Remodeled Home w/Greenhouse
3 BD/ 2 BA 2,420 sq.ft. 1.7Ac. **\$639,000**



NEW LISTING

122 Outlook Drive

Impressive Remodel
1 BD/ 2 BA 1,040 sq.ft. **\$525,000**



2874 S. Beaver Creek Road

Updated & Furnished 2 BD/ 1 BA
+ sep 453 sq.ft. Bunk Hs. **\$373,000**



105 Ponderosa Way

Magical Storybook Home
2 BD/ 1 BA 1,103 sq.ft. **\$519,000**



1209 Camp Eden

Remodeled Kitchen-Oversized Garage
3 BD/ 3 BA 2,288 sq.ft. **\$571,500**



3497 Coal Creek Canyon #18

Adorable Summer Cabin
3 BD/ 1 BA 1,184 sq.ft. **\$229,000**



126 Signal Rock

Lovely Landscaping/Divide Views
2 BD/ 3 BA 2,024 sq.ft. **\$600,000**



2663 Lump Gulch Road

VIEWS & Backing to National Forest
4 BD/ 3 BA 3,749 sq.ft. **\$649,000**



NEW LISTING

213 Rudi Lane

Oversized 2 Car Garage + Shop
2 BD/ 2 BA 1.15 Acres **\$449,000**



NEW LISTING

154 Olde Carter Lake

Magical Cottage in the Woods
2 BD/ 1 BA 839 sq.ft. **\$399,000**



Vacant Land

TBD Crescent Lake Road

Flat Lot, Privacy & Possible Views
1.43 Acres **\$125,000**



968 Divide View

Outstanding Views - 1.95 Acres
2 BD/ 3 BA 2,400 sq.ft. **\$649,000**



NEW LISTING

33858 Ave De Pines

Breathtaking Views - 2.8 Acres
3 BD/ 3 BA 2,345 sq.ft. **\$639,900**



NEW LISTING

14251 W. 91st, Arvada

Elegant Home w/Flatiron Views
5 BD/ 3 BA 4,786 sq.ft. **\$894,000**

Compass is a licensed real estate broker in Colorado and abides by Equal Housing Opportunity laws. All material presented herein is intended for informational purposes only. Information is compiled from sources deemed reliable but is subject to errors, omissions, changes in price, condition, sale, or withdrawal without notice. No statement is made as to accuracy of any description. All measurements and square footages are approximate. This is not intended to solicit property already listed. Nothing herein shall be construed as legal, accounting or other professional advice outside the realm of real estate brokerage.



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