HIGHLANDER

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Rocky Mountain Goat

By David M. Armstrong

Scientific Name: Oreamnos americanus

The mountain goat, like the moose, was introduced deliberately to Colorado, to expand hunting opportunities. The first such introduction was in 1947, when fourteen goats were imported from Montana and released in the Collegiate Range. Later, additional mountain goats were obtained from Idaho, South Dakota (from the introduced herd in the Black Hills), and British Columbia.

In 1993 the Colorado Wildlife Commission proclaimed the mountain goat a native species. However, most professional biologists doubt that the animals ever occurred in Colorado naturally. Some early travelers reported goats in Colorado, but none of those reports is absolutely reliable. Side-by-side, mountain goats and bighorn sheep look very different, but from a distance a person might mistake a bighorn female for a goat, because bighorn ewes have prominent, gently curved horns. Even today, visitors to Colorado's high country often identify bighorn sheep as "mountain goats." A bone from an extinct species of mountain goat was found in fossil deposits about 800,000 years old in Porcupine Cave, South Park.

With their shaggy white wool coats and black horns, these are beautiful and distinctive animals. Billies range to five feet long and weigh up to 250 pounds; nannies are somewhat smaller. Both sexes have sharp, black horns, six to twelve inches long.

Habitat: They mostly stay in their high mountain range year around, seldom going below tree line except in severe winter weather.

Diet: Mountain goats eat grasses, mosses, lichens, and some shrubbery. They tend to eat more broad-leafed plants than do bighorn sheep.

Reproduction: Kids are born in May or June after a gestation period of about six months. Twins occur in about a quarter of all births. Usually, half of a local population is yearlings. Because of the mountain goat's inaccessible habitat, mountain lions are one of their few predators. Rockslides or avalanches probably cause most deaths. Humans harvest 150 to 200 mountain goats in Colorado each year.

Credit: By David M. Armstrong Department of Ecology & Evolutionary Biology Environmental Studies Program, University Museum of Natural History University of Colorado-Boulder.

A Family Friendly Party Place Amidst Casinos

These are excerpts from an interview with Manager Robert, of Charlie's in Central City:

What makes Charlie's a special place to visit? There are a lot of people who don't want to hear the usual loud noise of the machines in all the casinos. There are actually lots of locals that do not wish to gamble and prefer a hangout place without gambling machines and the accompanying noise most casinos have.

Charlie's is a nice place for hanging out without that drawback, for locals and other visitors who might not want to gamble. It is an atmosphere where folks can relax, watch a ballgame and enjoy really good BBQ with slaw, potatoe salad or tater tots and maybe a good beer.

Why the decision to be family friendly by allowing and actually welcoming children in? We wanted to allow kids in for family dining, with the BBQ up until the kitchen closes around 8 or 9 pm and then we change to adults only for evening entertainments. If we have a band, live music might change the crowd a bit. Before that, our Arcade games and other kid friendly entertainments allow families to come and have fun together. As long as children are supervised by a parent or adult they are welcome to play pool, shuffle board, the arcade games or watch a ballgame.

Families sometimes utilize Charlie's to allow one parent or the other adults in a group to go gamble at the nearby casinos while the kids and the other parent or an adult hang out where they are welcomed and kept entertained. Not everyone in a group may choose or like to gamble so a family friendly business right on main street – downtown Central City – has proven to be a great gathering place for locals and visitors alike.

Since Charlie's is closed on Mondays and Tuesdays anyway it can serve as space to rent for that special occasion. The upstairs is always available to rent for holiday parties, weddings or receptions, birthday celebrations or even a recent memorial service.

The downstairs has a complete bar including imported beer on tap and in bottles and the BBQ service smokes great pulled pork, chicken and brisket with ribs as a specialty for Friday & Saturday evenings - right on site. Specials often show up on the menu: Nachos or Wings are favorites. Catering by the BBQ service for special occasions is reasonably priced and while you can rent the upstairs for your guests and keep that private, the guests have access to the downstairs for all the games and entertainment.

17th Annual Tommyknocker Holiday Week Festivities in Historic Central City

Thursday Dec. 4th Children's Parade 1:30 pm

Friday Dec. 5th Tree Lighting & Candle Walk 6:30 pm
with Peak to Peak Chorale Carol Singing
Community Pot Luck 6:45 pm (at the Teller House)

Sat. & Sun. Dec. 6th & 7th
10:00 am to 4 pm
HOLIDAY BIZAAR
with Crafters, Vendors & Entertainers

They have had pool tournaments and may start them up again for wintertime when folks want to stay out of the cold. Karaoke may become something that is an option soon. Children are usually awed by the flashy interior chandeliers and numerous mirrors *(see ad for the interior photographs this page)* so it makes for a great place to bring the entire family and visiting holiday guests.

Consider renting the upstairs space for your next event and wow your partygoers with the novelty of so many choices of entertainment while staying in the mountains. Located right next door to Dostal Alley, this establishment promises to become a well-loved option for Central City so be sure to go up and check out this fairly new local business. Support this family friendly small town effort so they can continue to give us a quieter atmosphere that is mostly missing from the Central City main street.

The popular BBQ food is also available for take out and there is plenty to do while your order is being prepared to go. Football games are a favorite time to visit as they offer Touchdown Shots at the bar with every Broncos score.

This establishment is already getting to be known for its friendly staff and attentive bartenders. This is by far a departure from the nearby corporate run casinos that often have so many customers it is difficult to get any employee attention to your needs or wants.

You won't be ignored or taken for granted and your kids can enjoy themselves without the worry of it being against the law for them to enjoy the fancy atmosphere, play arcade games while you shoot pool and still keep track of who is winning on the television. With plenty of room to move around it is not so large that you'll be constantly trying to keep track of the little ones.

Elderly visitors will be entertained by the atmosphere too while they are included and yet not hampered by numerous rooms to get lost in. They can feel included, imbibe at their liesure while watching the kids have fun right in the same room. This is a win-win, without a gamble - for one and all.

By A.M. Wilks

Ten Lessons From The American Robin

By Pepper Trail

For climate activists, this feels like the last moment. The huge marches in New York and other cities around the world were a reflection, among other things, of desperation. How loud must we scream before our so-called leaders will listen? How many hundreds of thousands must fill the streets before any of those leaders act?

In times like these, we need both the perspective and renewal of energy to be gained from nature's teaching. Many famous fables feature the attributes of animals we may never see in person: the courage of the lion, the memory of the elephant, the teamwork of the wolf pack. But in truth, we need look no farther than our backyards to gain instruction from nature. Here are ten valuable lessons I have learned from a species so familiar that we take it for granted: the American robin.

1. It's good to be common

The American robin is one of the most common and widespread native birds in North America. Their large population gives robins great resilience in the face of ecological and climatic challenges. Build the movement.

2. Adapt to where you are

Robins are found from steamy Southern swamps to the Alaskan tundra. Their remarkable ability to adapt to local conditions and resources is the secret of their success.

Tailor your message and manner to local conditions.

3. And also have one special skill

For all their adaptability, robins also have a unique and specialized skill: their earthworm-hunting behavior, which opens up a rich resource few other birds exploit.

Know your special talent and make the most of it.

4. Figure out how to take advantage of the dominant paradigm

Robins thrive in part because of their ability to make the most of human environments, nesting in our backyards and foraging on our lawns.

Don't be afraid to make alliances and to engage with mass media.

5. Be alert for phonies

Robins are among the few birds able to detect and toss out the eggs of the parasitic brown-headed cowbird, thus protecting their nests from invaders.

Welcome only those who truly share your values.

6. Know when to move on

Throughout their wide range, robins exhibit facultative migration - that is, they adjust their winter residency to specific conditions. In a cold winter, they head south; if the next year is mild, they may remain resident all year.

Know when to stage a tactical retreat, in order to win another time.

7. Encourage the young

Robins often produce two broods of offspring per year. That gives them a huge advantage over less-fecund species.

There's no substitute for the energy and idealism of the young when building a movement.

8. Be confident

Robins are often described as "bold," "confident," and "confiding," in contrast to related birds like the shy varied thrush. There is no doubt that the outgoing behavior of robins has contributed greatly to their success.

Believe in your cause whole-heartedly, and others will, too.

9. Be friendly

In addition to their boldness, robins appeal to us because they're friendly - even if they're keeping us company in the garden simply in order to snatch up earthworms.

A friendly, positive approach will gain many more listeners than one wrapped in doom and gloom.

10. Sing!

For many of us, the rich warbling song of the robin announces the arrival of spring, lifting our spirits after the hard winter. Isn't a beautiful message what we all want to hear?

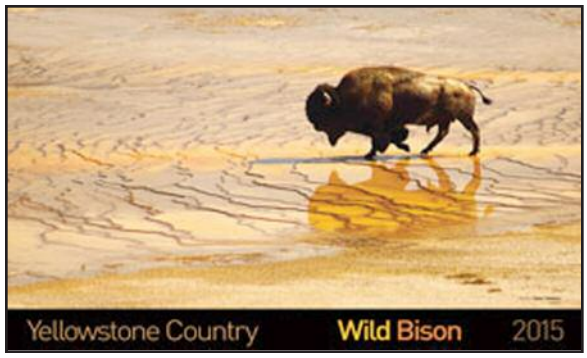
Sing!

Pepper Trail is a contributor to Writers on the Range, a column service of High Country News (hcn.org). He is a biologist and writer in Oregon.

Editor's Note: Soon it will be cold enough-long enough, with enough snow on the ground....hopefully, so we can put our birdfeeders out again without the threat of enticing bears. Suet season is coming too! Birds Rejoice!

Buffalo Field Campaign ~ www.buffalofieldcampaign.org

In an effort to truly protect the last wild, migratory herds of Yellowstone bison, Buffalo Field Campaign and Western Watersheds Project (WWP) filed a petition with the U.S. Fish & Wildlife Service recently to list them as threatened or endangered under the Endangered Species Act. The threats faced by this last wild population of bison are serious and many. Successfully protecting them under the Endangered Species Act is going to require hard work and persistence. It will take, in the words of Endangered Species Coalition President Brock Evans, "endless pressure, endlessly applied." We are extremely grateful to our colleagues at WWP for their hard work, dedication, and collaboration. We also want to thank you, our supporters, for making it possible for us to advocate for the buffalo's permanent protection. We couldn't do any of this without you and your past, present, and future contributions. Read the joint press release and full ESA petition on our website.
WILD IS THE WAY ~ ROAM FREE!



Public Process Hijacked by Livestock Interests: Montana Announces Addendum to 2013 Bison Habitat EA - More than a year after the public made it crystal clear they wanted more wild bison inhabiting greater portions of lands in Montana, Montana Fish, Wildlife & Parks and Dept. of Livestock officials have backtracked by re-opening a public comment period on their 2013 Environmental Assessment (EA). This EA is for year-round buffalo habit in the Hebgen and Gardiner Basins, west and north of Yellowstone National Park. Broad public support for year-round habitat has already been demonstrated. Almost 120,000 public comments favorable to wild buffalo were received by Montana during the summer of 2013. Montana's Board of Livestock refused to accept this pro-buffalo public opinion and, in March of 2014, hijacked the process, **refusing to defer to the will of the people and forcing slaughter ultimatums for any increases in habitat.** Bending to the will of the livestock interests and allowing them to corrupt the public process, Montana officials have added a new set of alternatives to the original 2013 EA. **The addendum would allow for buffalo to use more of the Montana landscape outside of Yellowstone**, but **only in exchange for a significant increase in slaughter.** Montana's buffalo-slaughter-for-habitat proposal is a dirty compromise between Montana Fish, Wildlife & Parks and the Montana Dept. of Livestock. It shows how the livestock industry has corrupted the public decision making process and management of the public's buffalo. If this proposal is implemented, wild buffalo will only be given year-round habitat if their numbers are reduced to and kept under an arbitrary cap of 3,300 animals. The larger the population, the less land they would be allowed to access and the more slaughter and hunting would be used to kill them. Montana's slaughter for habitat proposal exemplifies the corruption of cattle ranchers in charge of wild buffalo.

BFC has an updated Take Action alert and official comments to address this new addendum. The public has until 5pm on December 11, 2014 to submit comments. 318 Buffalo Originating from Yellowstone Become Livestock - In November, 139 Yellowstone buffalo were loaded up and trucked out of a quarantine facility on media mogul Ted Tuner's Green Ranch to a fenced range unit on the Fort Peck Indian Reservation. In exchange for housing these buffalo, Turner gets to keep an additional 179 Yellowstone buffalo as private livestock. Some privately owned, some part of commercial or tribal business herds, all fenced for life, ear-tagged, and annually culled, these 318 buffalo that originated from the wilds of Yellowstone Country have sadly been reduced to livestock. 2015 BFC Calendars are available in support of our efforts at the website. **Be sure to add your comments *(or use ours)* by clicking on the TAKE ACTION buttons.**

Signs Warn-Sharp Turns Ahead In Global Health

A scientist who recently discovered that crop nutrients drop as carbon dioxide levels rise – signaling a serious global health threat to animals and people – was a guest speaker on the topic of future global health at Colorado State University on November 19th.

Dr. Samuel Myers, a physician at Harvard Medical School and a senior research scientist in the Department of Environmental Health in the Harvard School of Public Health, delivered the annual Distinguished Guest Lecture hosted by CSU's College of Veterinary Medicine and Biomedical Sciences.

"We invited Dr. Myers because of his expertise in global health, which is a focus for many CSU colleges," said Dr. Sue VandeWoude, associate dean for research in the College of Veterinary Medicine and Biomedical Sciences. "His areas of research are particularly relevant to the work of our School of Global Environmental Sustainability and the CSU One Health Initiative, which is concerned with science at the intersection of human, animal and environmental health."

Myers' talk was titled ***The Trajectory of Global Health in the 21st Century: Sharp Turns Ahead.*** During his presentation, Myers discussed his carbon dioxide study; the research was published in the journal Nature in June. He also highlighted other signs that human impacts on the planet may have serious unintended and unexpected consequences on global health.

"Climate change is only one way in which we are rapidly and dramatically changing all of the natural systems on the planet," Myers said in an interview. "Our thumbprints are all over Earth's natural systems. And what's deeply concerning is we have no idea what the implications of those changes are." He cites other human-induced changes: depletion of fisheries, decimation of forests, reductions in fresh water, and a 50 percent decline in vertebrate species over the last 40 years.

During his presentation, Myers also discussed how declines in animal pollinators could reduce the global intake of micronutrients, including vitamin A and folate, and the consumption of important food groups; this, in turn, would likely increase disease in many countries.

"In the history of the human race, we've been co-inhabitants with other species on planet Earth, experiencing biophysical conditions that are the result of natural processes. But over the last several decades we stopped being co-inhabitants and took charge, pushing buttons and turning dials and becoming the defining force determining those biophysical conditions," he said. "The more we turn those dials and alter the conditions that we, and all other life forms, have adapted to over millions of years, the more we're going to encounter health impacts that may be surprising and very large. It's probably going to be the biggest public health challenge we face in the coming centuries."

Myers cited CSU's One Health Initiative as an example of the transdisciplinary research that is sorely needed, and he said more government funding is necessary to investigate the coming impacts.

"We need to understand what we're trying to fix," he said, noting that the world's population has more than tripled since 1950 and economic growth has skyrocketed. "The scale of our impact on the planet has accelerated in a way that very few people understand. It's urgent that we do something about it."

The Distinguished Lectureship is an annual invited talk that showcases an outstanding scientist whose work interests many faculty members in the College of Veterinary Medicine and Biomedical Sciences. The speaker meets with faculty and students prior to the afternoon seminar and in other group sessions. Myers' visit is sponsored by the college and the CSU School of Global Environmental Sustainability.

(Courtesy of CSU press release.)

Ozone Rising

By Sarah Gilman

On a crisp fall day lined with cottonwoods yellow-bright as balls of flame, I take a gravel shortcut from Utah's Nine Mile Canyon toward Vernal, an energy boomtown of some 10,000 souls. Though I've spent the day looking at natural gas wells going in along the fingers of the plateau that cradles Nine Mile's storied rock art, I'm surprised by what I encounter shortly after hitting asphalt, popping up around each curve in time to Phil Collins crooning a Supremes cover on the radio: Pumpjacks. Everywhere.

You can't hurry love? No you'll just have to wait
Two tall as buildings nod up on the right.
She said love don't come easy?It's a game of give and take
Two more nod down the left. Then another two.
How long must I wait? How much more must I take
A prickling of several more on the mesa tops, and then...
Before loneliness? Will cause my heart, heart to break?

the broad dome of dry-grass desert opens up to reveal a vista that is anything but lonely: Densely spaced oil wells and clustered tanks spread to the horizons. When I pull over and climb onto the shoulder, I can feel a vibration deep in my chest – hundreds of pumpjack engines rattling with flatulent backfires like impolite party guests.

If it were a cold, still day with snow carpeting the ground, there would likely be a lungful of nasty air to accompany this chorus, and a much hazier view. That's because wintertime inversions occasionally close over the Uintah Basin like a giant Tupperware lid, sealing in pollutants from its more than 10,000 active oil and gas wells, associated truck traffic, drilling rigs and waste disposal facilities, and help facilitate a chemical reaction that produces ozone levels that rival those found in urban Los Angeles. In Vernal last winter, monitors recorded ozone levels exceeding national standards on 22 days, and in neighboring Roosevelt, 29 days, with episodes ranging from three to 15 days in length. The gas can harm lungs, and exacerbate existing respiratory and cardiac ailments.

And though the valley's population is small enough that it's difficult to definitively demonstrate local health impacts, levels are certainly high enough to produce them. Utah health officials are currently looking into whether the area has a higher-than-normal infant mortality rate, after a local midwife found an increase in deaths based on obituary records.

As part of a collaboration between the state, the National Oceanic and Atmospheric Administration, the Bureau of Land Management and several academic institutions,

researchers are zeroing in on the specific chemistry and sources of those emissions in hopes of decreasing them. One study published in Nature on October 1 traced local ozone formation back primarily to volatile organic compounds (or VOCs), some 97 percent of which are released by industry activity – a difference from ozone in urban areas, where nitrogen oxides play more of a role. Scientists using a mobile laboratory, meanwhile, recently published findings that individual well pads are likely responsible for the bulk of Uintah Basin emissions, particularly via holding tanks, as well as equipment that separates liquid fuels or water from natural gas.

State and federal officials are already working to tackle some of these sources; the Environmental Protection Agency in 2012 finalized new source performance standards (since updated twice) – to be fully implemented next year – that should cut VOC emissions from new wells by 95 percent. And last month, Utah enacted rules that apply to existing infrastructure as well. These require ongoing maintenance of pollution controls; replacing pneumatic controllers on holding tanks – which allow gases to vent directly into the atmosphere whenever pressure builds enough – with low- or no-bleed valves; putting autoigniters on flares so that they don't, in the event of extinguishing, release unburned hydrocarbons into the mix; and bottom-filling instead of splash-filling tanker trucks, which will cut those emissions 50 to 60 percent.

Since much of the pollution likely flows from older equipment and practices, says Utah Department of Environmental Quality Deputy Division Director Brock LeBaron, those changes could produce marked improvements, even as new development marches onward. To help ensure compliance, the state has also doubled the number of inspectors working the basin from two to four, and although that still puts each site on an inspection cycle of two to three years, he argues, their presence and visibility should encourage producers to fall in line.

The Bureau of Land Management, meanwhile, increasingly demands pollution controls from companies proposing to develop on public land, says the agency's Utah air quality specialist, Leonard Herr, such as pipelines to reduce truck traffic, centralized facilities to make emissions capture easier and relying on electricity instead of engines to power field infrastructure. The agency is also heading up a basin-wide air-quality modeling effort to guide future decisions about development. "It's too early to make definitive statements" about results, says Herr. "More wells are being drilled, but ozone is not going up. That said, it's not going down either."

"We might be allowing construction of something so gargantuan that it's impossible to keep emissions in check. Sealing all the possible leaks in the system might be physically and logistically impossible."

Such efforts are steps in the right direction, says Jeremy Nichols of the environmental group *(Continued next page.)*

WildEarth Guardians, which sued the EPA over its decision not to designate the Uintah Basin a nonattainment zone in hopes of ushering in a mandated and much stricter ozone reduction plan. But their success will depend in part on how the EPA and the Ute tribe decide to further regulate oil and gas development on neighboring Indian Country, which accounts for a large portion of emissions.

And "ultimately," given the 30,000 or so new wells expected in the Uintah Basin, he adds, "it's an issue of scale. The traditional thinking is that you can always slap on a control. But at the end of the day we might be allowing construction of something so gargantuan that it's impossible to keep emissions in check in a way that really protects public health. Sealing all the possible leaks in the system might be physically and logistically impossible." Indeed, the BLM's most recent report from its modeling effort found that simply controlling VOC pollution from all condensate tanks and dehydrators — both major sources — will result in only small cuts to ozone levels from foreseeable oil and gas development by 2021, and still fail to meet federal health standards. And by the end of this year, the EPA is expected to float a proposal to make those standards significantly tighter. "That's going to make the hurdle tougher," says LeBaron. "But we know which direction we need to go, and we're going to keep plowing away."

Some of the new state and BLM rules already go farther than the BLM has had a chance to model says Herr, but additional measures are likely to be necessary. Depending on what the cooperating agencies involved decide, that could mean adding controls to a broader array of equipment and strengthening and expanding inspection and maintenance programs — which, he says, might be enough. And if not, seasonal restrictions, an emissions budget with a set cap on pollution or even reducing future development could come into play. But whatever the mechanism, "I have complete confidence that the Uintah Basin's ozone problems are solvable. We have a great track record in this country. Compare 1950s air quality issues to now. Lead? A nonissue. Carbon monoxide? Solved pretty much everywhere." And none of those efforts crippled local economies, he points out.

But don't hold your breath that the resolution of local pollution will be speedy (or, actually, maybe you should … benzene, one of the VOCs involved, is a potent carcinogen at high levels). As the Supremes so sagely noted about love, it's pretty difficult to hurry regulatory mechanisms that involve multiple jurisdictions and an economic powerhouse of an industry. "Let's get the ozone down now and not wait through the years and years that nonattainment planning takes," says LeBaron. "I'll be dead before that process wraps up. Seriously."

Sarah Gilman is a High Country News contributing editor.

Zen And The Art Of Wildflower Science

By Krista Langlois - High Country News

Over his 40-year tenure at the Rocky Mountain Biological Lab near Crested Butte, Colorado, biologist David Inouye has discovered that wildflower season has increased by 35 days since the 1970s.

Outside David Inouye's Colorado cabin at 9,600 feet, the morning air still smells like yesterday's rain. Bumblebees, drunk on pollen, drone from one flower to the next, while hummingbirds zip back and forth like tiny fighter pilots to the sugar water Inouye puts out for them. Inouye, a research ecologist from the University of Maryland, stands stock-still on a deck, one hand holding the red plastic hummingbird feeder, the other moving slowly toward it. The iridescent birds ignore him. One hovers at the cusp of the feeder.

Inouye's hand creeps closer. Without a sound, he closes it. His grip is firm but not constricting, and the male broad-tailed hummingbird that against all odds finds itself enclosed in a human fist doesn't seem alarmed. As Inouye carries it through his creaky cabin door, its head peeks out from between his thumb and pointer finger, its black eyes curious, alert.

In his four decades at the Rocky Mountain Biological Laboratory in Gothic, Colorado, Inouye has captured and banded some 500 hummingbirds in an effort to understand their niche in the meadows surrounding his cabin. When he started, he had no intention of documenting climate change. But lately, as its effects have begun rejiggering alpine communities worldwide, Inouye's research is emerging as one of the strongest indicators that mountain ecosystems are changing more quickly — and more dramatically — than previously suspected. The most compelling evidence comes not from hummingbirds, but from another, unexpected byproduct of Inouye's patient research: A massive data set on the plants they and other pollinators visit.

Back in the early 1970s, Inouye realized that to understand hummingbirds, he also had to learn about wildflowers. So he and a group of colleagues each plotted out a few patches of meadow in the West Elk Mountains and spent the summer counting the number of blooms there. After a few years, his colleagues had the data they wanted and abandoned their plots. But Inouye, then a Ph.D. candidate at the University of North Carolina, kept plugging away.

Every summer, he returned to the same high-altitude meadows, meticulously recording how many of each species of flowers there were, when they blossomed and when they died back. By 2013, he and his grad students had amassed an unparalleled data set, covering some 2 million individual flowers from 121 species. It was enough to conclude that, since the 1970s, *(Continued next page.)*

Rocky Mountain wildflower season has lengthened by an average of 35 days.

The implications of that finding — published earlier this year in the Proceedings of the National Academy of Sciences — reach past these particular alpine meadows, to the rest of the Rockies and beyond. "Across the globe, one of the strongest indicators of climate change is the timing of biological events," says the study's lead author Paul CaraDonna, a 26-year-old Ph.D. student at the University of Arizona. Other studies have focused just on the date of first flowering, which offers only a half-formed picture of the changes taking place.

To the wildflower enthusiasts who gather each year in the nearby mountain town of Crested Butte — the official wildflower capital of Colorado — an extra month of blooms may seem like the bright side of climate change. But because most alpine species are perennials that can live up to 30 years, "flowering longer could actually have a counterintuitive effect," CaraDonna explains. "They're investing so much energy in reproduction that they may actually be growing less."

Plus, a longer flowering season doesn't always mean more flowers, because while snowfall tends to melt earlier, the date of winter's last hard frost hasn't changed. Many plants are budding sooner, but a solid frost in May or June will still kill them, resulting in years with very few flowers. (Colorado fruit growers face a similar problem: False springs cause orchards to bud too soon, only to have the burgeoning apricots and cherries killed off when wintry weather returns.) *(Above photo by Andrew Cullen- HCN.)*

In the alpine zone, that kind of die-off affects bees, butterflies, hummingbirds and other flower-reliant creatures. Broad-tailed hummingbirds like those summering outside Inouye's cabin, for example, migrate from Southern Mexico to the Colorado Rockies every spring. Their cue to head north seems to come from the lengthening daylight, which means they'll continue to arrive at roughly the same time regardless of how climate change affects conditions at the northern end of their route. Some years, they may arrive to find hardly any flowers at all. Other years, they may find that peak flowering of the species they depend on has already come and gone. "The floral landscape is being reshuffled," CaraDonna says. "It's like going to a grocery store and getting used to all the food items being in the same aisles, and then you go back and everything's in a different place."

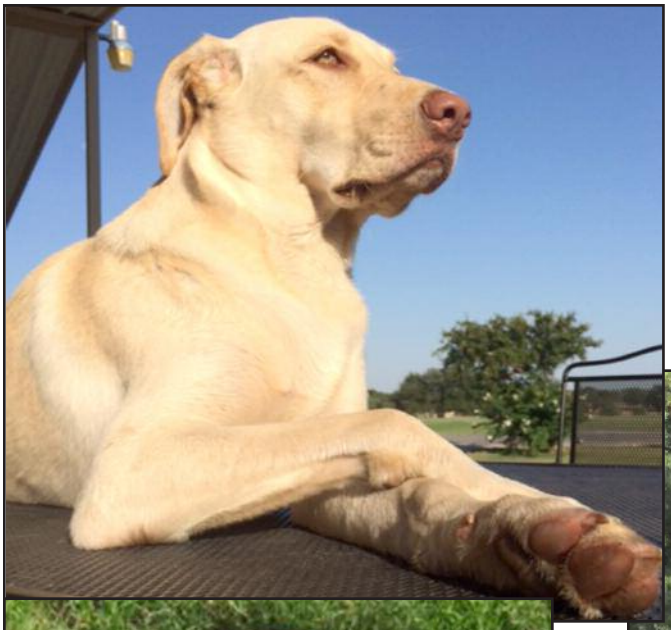
With the hummingbird still peering out from his left hand, Inouye uses his right to pour himself a cup of tea. He sips it gingerly before fitting the hummingbird's leg with a metal band no bigger than a grain of rice and jotting its ID in a handwritten log.

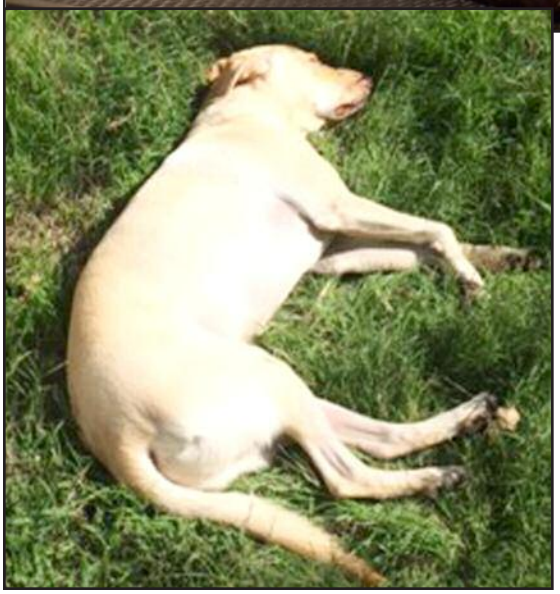
Tall and lanky, with black hair just beginning to go gray, Inouye, now 64, moves with a Zen-like patience. His demeanor is well-suited to the Rocky Mountain Biological Lab, a rustic field station in an old mining camp where some of the country's longest-running ecology studies take place. Scientists here tend to return year after year, and their pursuits are the stuff of bio-nerd lore: The lab's only permanent resident, Billy Barr, has turned decades of lonely winter nights into one of the most comprehensive avalanche and snowfall records anywhere, and a project documenting yellow-bellied marmots is so long-lived it's been handed down from one scientist to the next, like an heirloom. The desire to understand this one place has surpassed science and become a kind of love.

"As humans, we live 60 to 100 years if we're lucky," CaraDonna says. "But ecosystems operate on such a different scale. We've gotten amazing insight into how natural systems work because we've been paying attention to them for so long, and from so many different perspectives."

Inouye's own family history at Gothic spans four generations: his father, a physician, volunteered here in the '70s; Inouye's son, Brian, has been coming since he was a year old. Now 44, Brian and his wife — fellow biologist Nora Underwood — bring along their daughter, Miyoko, who spends her days catching bugs with the lab's day camp. If Miyoko returns as an adult, the landscape she'll see may be hardly recognizable. But thanks to her family's work, she'll have access to a detailed record that will help her, and us, understand what's been lost.

At the cabin, Inouye pads back out to the front porch. He unfurls his hand. A moment later, the emerald bird, weighing about the same as a penny, is sucking nectar from a nearby patch of larkspur. Then it lifts up into the sky, a dark speck against a blue canvas, plummets, and is gone.





Top Left: Buddy poses!

Top Right: Goats rob birdfeeder, more photos next page.

Bottom Left: Buddy taking a nap in the nice green grass.

Right: Julie & Jake in front of the Divide View.

Send your favorite animal or wildlife photos to
news@highlandermo.com

Above:
Jingles & Valentine robbing birdfeeder (as dog on porch just watches).

Top Right: Jingles climbing rock outcropping.

Bottom Right:
Valentine on rocks.

Thanks to Johnnie G. for great goat photos!

Giving Thanks & Looking Forward

By Tim Lydon

With Thanksgiving just past, it's the season to be grateful and take stock of our situation. In that spirit, here's some of what I've been thinking about. First, as we conclude our celebration of the golden anniversary of the Wilderness Act, let's give a cheer to the 88th U.S. Congress, which, in 1964, passed the law almost unanimously.

Congress' legacy is a 109-million-acre wilderness system that continues to expand despite frequent efforts, generally Republican, to thwart new collaborative proposals and weaken protections. These lands are meant to be set aside for solitude, research, adventure and future generations - of people, bears, loons and other creatures. As a haven for both wildlife and the human mind, wilderness is more relevant than ever as we face the entwined crises of climate disruption, ocean acidification and declining biodiversity.

But while giving thanks, we should also acknowledge that our wilderness system is still a work in progress. Many good wilderness proposals are stalled in Congress, and as climate change ramps up, we need to encourage ideas that increase connectivity between wild places.

Though I'm grateful to a host of American conservationists, recently I've been thinking a lot about Ed Abbey, because as much as Henry David Thoreau or John Muir, Abbey knew the importance of wildness to the human spirit. He rooted himself in the American desert and fought for its protection with his books, and yes, sometimes with the "night work" known as monkey wrenching. Cactus Ed's uncompromising love of the wild is something to consider today as our free spaces disappear and scientists warn we are going over the cliff on climate.

I'm also glad Dave Foreman is still kicking. A former Wilderness Society staffer and Sierra Club board member, he co-founded Earth First!, the Wildlands Network, the Rewilding Institute and the New Mexico Wilderness Alliance, and has written books on the state of nature. He has spent his life protecting wild places, and he's still out there giving rousing sermons on wilderness. Catch one - live or online - if you can.

I'm also thankful for Celia Hunter, Ginny Wood, Rachel Carson, Rosalie Edge, Mardy Murie, Julia Butterfly Hill and Gwich'in elder Sarah James, among many others, who

remind us that women have long played heroic roles in conservation. In the early 1960s, Carson refused to let the physical pain of cancer prevent her from testifying before Congress about the harm that pesticides and other chemicals do to wildlife, workers and children. She was vilified and threatened, but her work led to bans on DDT and other poisons. In women is the preservation of the world — I hope Thoreau would agree.

Terry Tempest Williams deserves thanks, too. Her love for the West's land and people is as strong as anyone's, and her message is clear: We are losing our public lands, wildlife, oceans and climate. She calls us to direct action, each in our own way.

Williams is a loyal supporter of Timothy DeChristopher, aka Bidder #70. In December 2008, DeChristopher monkey-wrenched a Bureau of Land Management oil and gas lease auction for lands alongside Canyonlands and Arches national parks. Like Thoreau, Martin Luther King and others, he was jailed for his peaceful protest, although his nearly two years behind bars for spoiling an auction far exceeded the sentences served by King or Thoreau. His civil disobedience spotlighted many illegal Bush-era leases that were eventually overturned.

I'm also thankful to the 400,000 people who joined the People's Climate March in New York City in September, co-organized by climate activist Bill McKibben. Many rode overnight on cramped buses to reach New York, where they merged with a river of humanity flowing through the canyons of Manhattan. The main stem was 30 blocks long, with tributaries of marchers surging through side streets. It was a peaceful flood of humanity — people coming together to call on world leaders to adopt a clean-energy future. Over 1,000 simultaneous events occurred across the globe.

There has never been a moment like this. In 2014, we steadily rose toward the dangerous average of 400 parts-per-million of atmospheric carbon dioxide. The oceans absorb much of this pollution, creating the most acidic conditions in some 50 million years. Like it or not, we may be the most important generation in human history.

As Americans, we bear a unique responsibility, as our lifestyles produce something like one-fifth of the planet's heat-trapping CO2 molecules. But we also have social stability and a proud history of free speech. So, while it's a time for thanks, let's also read some Cactus Ed and other writers, whose stories have helped to bring about change. Let's think about the role we'll play in the year ahead, because any way you look at it, no one sits this one out.

Tim Lydon is a contributor to Writers on the Range, a column service of High Country News (hcn.org). He writes in Girdwood, Alaska.

Today Is The Day

By Melissa E. Johnson

He said, "There are only two days in the year
that nothing can be done.
One is called yesterday and the other is called tomorrow,
so today is the right day to love,
believe, do and mostly live.
~Dalai Lama

He saw me before I noticed him. By then it was too late. Shocking red and blue lights swirled in the dark of night as I steered my car to the side of the road.

The officer approached. "Good evening, ma'am. Do you know the speed limit here in this part the canyon?" "45," I said. "Yes. And do you know how fast you were going?" "45?" I said. [Officer laughs.] "Well, now I wouldn't be standing here if you were going the speed limit. When I first saw you," he said, "you were doing 57… and then you sped up!"[More laughter.]

I think I was more surprised than he; still, I had no real excuse. I was tired. It was late. I had worked all day and was coming home from a board meeting at Children's Hospital. My husband and wonderful canine friend waited for me at home. But what was the hurry? What was so important that I would go 20 miles over the speed limit without any awareness of how fast I was driving? For that matter, I didn't even remember the last seven miles or so. Apparently I had navigated the familiar curves of the dark canyon just fine, but I couldn't will myself to remember. Had I been in a trance? I pondered this while the officer checked my license, registration and insurance.

He lectured me on the dangers of going too fast in the canyon—the wildlife and fatal accidents and such—and he made me promise to "slow it down," which I did. Then he let me go with a warning. "I won't let you down," I vowed before driving away.

The rest of the way home I drove the limit, conscious of my surroundings and the beautiful starry-night sky. I turned off the radio. I thought about the way we tend to rush from one thing to the next, never truly enjoying the present moment—the silence, the beauty—because we're focused on some future event, like what we're going to do when we get home, or we're thinking about something that already happened, a phone call or conversation, zoned out; missing the strange and wonderful, once-in-a-lifetime moments before us. Moments that could be filled with wonder and

gratitude—there's magic in the mundane—but, once spent, we can never get them back.

I'm reminded of this as we move into the holiday season, where the tendency is to spend our time in a planning state; checking things off our to-do list and watching the days on the calendar bring us closer to "the day." When you find yourself in this state, STOP! And remember: TODAY IS THE DAY… To make it happen… To give up who you've been for who you can become… To make your dreams come true.

Today is the day. Be glad and rejoice!

Melissa is a writer, photographer, artist and lawyer. Read more on her blog at www.HeartLaw.blogspot.com.

A special thanks to Melissa for her monthly contributions of Wisdom that make up this column and true loyalty to this publication.

Happy Holidays and thanks to all contributing writers and photographers, and ALL our Advertiser's. Be sure to tell them you saw their ad in the Highlander!

Moffat/Gross FEIS

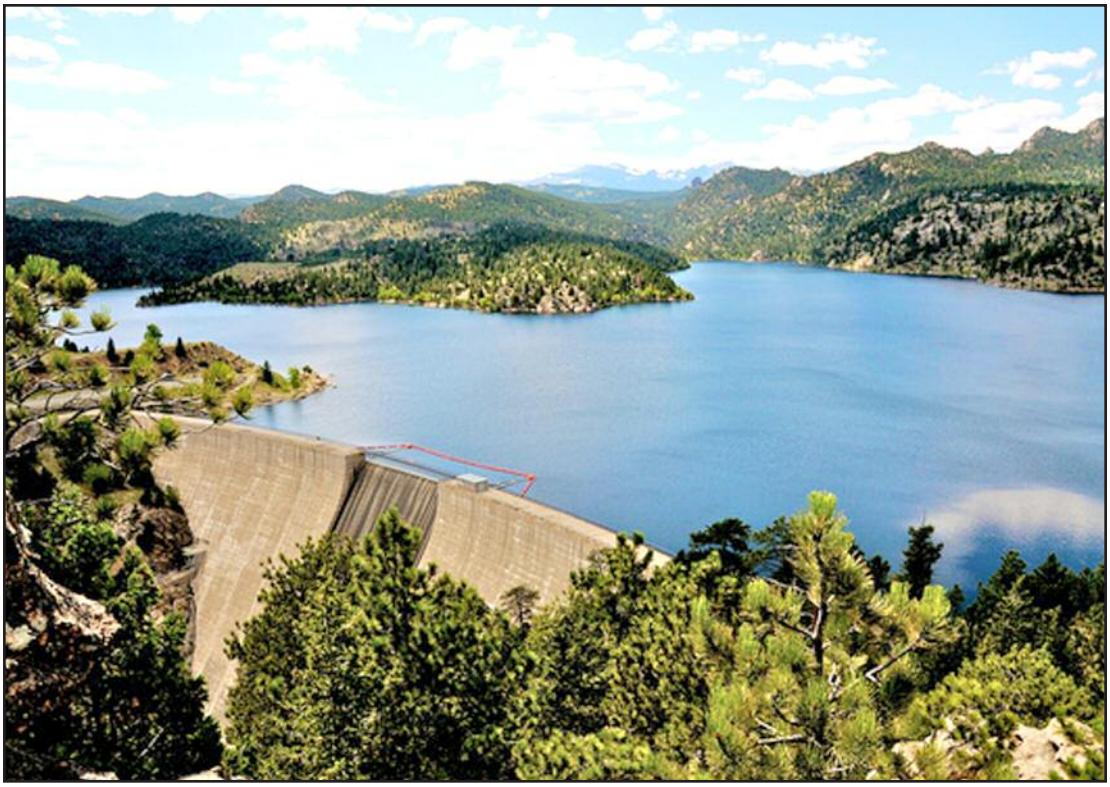
Excerpts from Boulder County's Supplemental Comments on the FEIS for the Moffat Collection System Project i.e. Gross Dam & Reservoir Expansion. Sent to US Army Corps July 1, 2014.

"The Proposed Action Does Not Meet the Purpose and Need for the Project: According to the FEIS, the Corps independently reviewed Denver Water's Near-Term Strategy and concluded that the development of 18,000 acre-feet per year of new firm yield 'is the only action to be analyzed in the EIS.' (1-23) Boulder County believes that the range of alternatives has been unreasonably restricted by its narrowly defined Purpose and Need, precluding the consideration of any alternative that would serve Denver Water's customers with a secure and reliable water supply, such as enhanced conservation and efficiency or a combination of other small project throughout its system, but which would not bring 18,000 acre-feet of water per year through the Moffat Treatment Plant. Nonetheless, even if the stated Purpose and Need for the project are accepted, the Proposed Action fails to meet that Purpose and Need.

In explaining and analyzing the alternatives, the Corps, together with its contractors and cooperating agencies, analyzed historic stream flows for the 45 year period from 1947 through 1991 to determine the amount of supply that is estimated to be available to meet Denver Water's stated needs. The conclusion that there is enough water available to meet the firm yield criteria of the Purpose and Need is fundamentally flawed in two respects: 1) it does not recognize that historic flows fail to meet the Purpose and Need; and 2) it does not consider the impact to water supply that will be caused by predicted climate change.

Most of the water for the enlarged Gross Reservoir would come from tributaries of the Colorado River. In the Corps' 2012 Colorado River Basin Water Supply and Demand Study, the Corps recognized that concerns regarding reliability of the Colorado River system to meet future basin needs are more apparent than in studies done over the past several decades "given the likelihood of increasing demand for water throughout the Basin coupled with projection of reduced supply due to climate change." (Exec. Summary at pg. 4) If the Corps accepted predictions of reduced supply due to climate change in this report about Colorado River water supply, why doesn't it accept it in the FEIS?"

Editor's Note: Next year the $11 million Colorado River Conservation Partnership – between the Dept. of Interior, Denver Water, Central Arizona Project, Southern Nevada Water Authority and the Metropolitan Water District of Southern California have all agreed to the goal of putting water back into the Colorado River. While the 'demand management' in this partnership is driven by



lakes Powell and Mead water levels dropping too low for their dams to generate electricity SO, a gross mistake by Denver Water for them to pull more water into Gross Reservoir, ***(which has to come from the Colorado River.)***

I don't believe the Moffat Project can be approved or permitted and Denver Water still honor their part of the Colorado River Conservation Partnership. Makes us all question their integrity on all counts. If I were a citizen of Denver I'd be contacting my representatives at the Capitol asking just those questions.

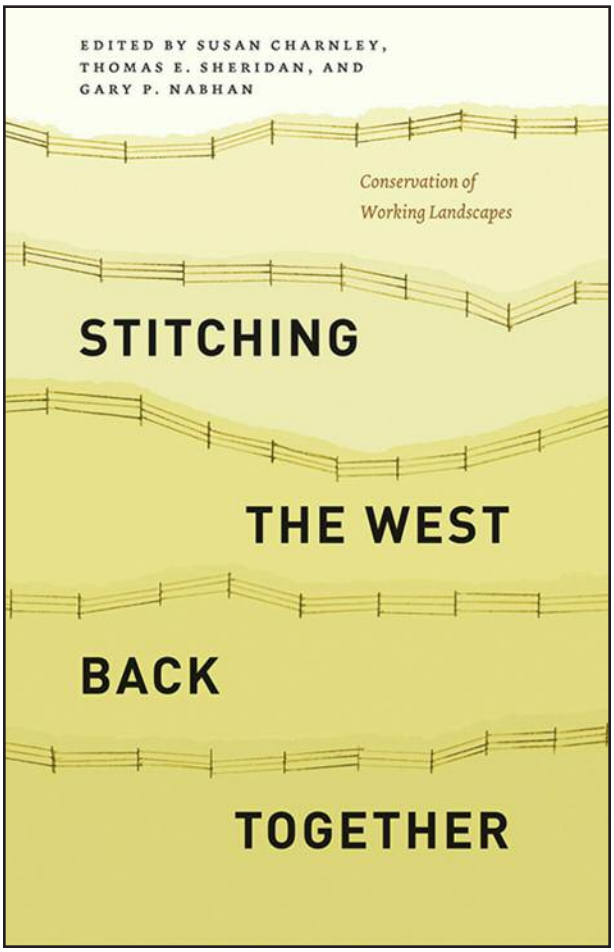
The recent ozone study done by NOAA and NCAR have shown hazardous levels of 'not your normal' ozone, but the one made by construction byproducts instead of mere particulate matter mixing with chemicals. This occurrence of ozone in Rocky Mountain National Park above 17,000 feet is another glaring reason for Boulder County to say no to 'the biggest construction project in the County' – expansion of Gross Dam, reservoir and the major road construction on Gross Dam Road and Highway 72 just to make the haul routes navigable for the big trucks necessary for the proposed project.

The possibility of the Moffat Project promotes further degradation to our air pollution problems. No one living near the proposed project site moved to or lives in the mountains to deal with worse air pollution than city dwellers. Take one look at the smog inversion along the metropolitan front-range, especially in winter and that could be what we'll have in Coal Creek Canyon and the city of Boulder should the construction start – IF THE PROJECT IS APPROVED!

(Photo of Gross Dam & Reservoir by Michael Bandow.)

Conservation Wisdom From The Radical Center

Review by Caroline Tracey-HCN



Stitching the West Back Together: Conservation of Working Landscapes
Susan Charnley, Thomas E. Sheridan, and Gary P. Nabhan (eds.). 352 pages, paperback: $35. University of Chicago Press, 2014.

Stitching the West Back Together assembles the experiences and reflections of ranchers, foresters, local officials and academics looking for new and sustainable solutions to the region's conservation problems.

The book urges conservationists, government employees, tribal officials and private landowners to meet at the "Radical Center," where goals are ambitious and, most importantly, shared: building a West that is ecologically, aesthetically and culturally healthy. ***Stitching*** argues that working landscapes, such as ranches and timberlands, are vital to the preservation of both natural biodiversity and rural culture. "The only way to achieve conservation at a large scale," the authors write, "is to maintain or restore ecosystem health across the jurisdictional boundaries ... that divide us."

These boundaries — the West's "checkerboard of public, tribal, and private land" — are described in a short history that serves as an introduction to the main part of the book: case studies of collaborative conservation experiences in forest and rangeland management. The authors focus on how private landowners can preserve species and habitat and yet still make a living. Examples include the Montana Legacy Project, in which the Trust for Public Land and The Nature Conservancy purchased 310,000 acres of Plum Creek timberland to convey to public and private conservation owners, and the Diablo Trust, an Arizona ranchers' cooperative, whose members collaborated to build a local food economy, restore soil and watersheds, and increase their own income. Other suggestions in the "widening toolkit" include conservation easements, open-space bonds and mitigation banking, in which developers who plan to destroy significant habitat must pledge to protect habitat of equivalent value.

Each chapter moves deftly from data to "how-to," and offers a bullet-point list of lessons. Readers facing specific challenges can find stories that speak to their needs, but people with more general interests will also find the book as a whole accessible and even inspiring. Both will come away with new ideas for entrepreneurial approaches to conservation.

With sections by an impressive range of scholars and practitioners, ***Stitching*** embodies its own lesson — that success is achieved by working with a diversity of approaches. The book reminds us that "the promise of collaborative conservation, is the possibility of realizing some of the most powerful potentials of a democratic system of governance for people and places."

Part 2 - Overpopulation

By Frosty Wooldridge

Series on overpopulation in America—endless additions create endless shortages - The developing world adds 137 million newborns annually, educational nightmare, providing food impossible, misery index accelerating

Dr. Otis Graham in his book ***Unguarded Gates***, said, "Most Western elites continue urging the wealthy West not to stem the migrant tide [that adds 80 million net gain annually to the planet], but to absorb our global brothers and sisters until their horrid ordeal has been endured and shared by all—ten billion humans packed onto an ecologically devastated planet."

When Graham wrote his book, he uncovered uncomfortable aspects of humanity's race toward endless population growth on a finite planet. Let's examine what he addressed that you see summed up in the quote above.

Each year, with the current world population of 7.1 billion human beings, an average of 57 million people die off from all causes—old age, war, disease, starvation and other violence. Not only does human fecundity replace that 57 million people who died, it adds another 80 million to total 137 million newborn babies every year of every decade without pause. Thus, **the human race adds one billion new humans onto the planet every 12 years**. Humanity expects to break 10 billion by 2050—a scant 36 years from now. Demographic projections indicate the human race could very well reach 14 billion by the end of the century.

(Massive poverty in Mumbai, *(Photo this page.)* India right next to the airport. Notice the filth and trash spread all over the ground. Note that over 100 million people if not more living in India cannot access a toilet, but use the land daily. Thus the ground water, the Ganges and all other rivers run in raw sewage. Note that India adds 11 million people net gain annually to its 1.21 billion population on its way to becoming the most populated country in the world by 2050 at 1.6 billion humans living in intractable poverty, totally miserable and hopeless.) *(Continued next page.)*

Photography by Reuters

First of all, with that huge number of newborn children, the countries that give births to that many people cannot educate them. Thus, illiteracy, the barometer for all poverty and human misery—accelerates. Further, they cannot feed them. Thus, the United Nations estimates that a low of 10 million children starve to death annually and as high as 15 million. Even with 10-15 million of them dying, it leaves 122 million to feed, water, house, educate and eventually create work for their lives.

As you can imagine, it's not working. The eruptions in Africa in the past several years revolve around food crises. Egypt alone with its 82 million subsisting on desert sands expects to reach 150 million by mid century. Egypt depends on grains from the West to feed its human multitude, but as oil depletes and costs more, Egyptians will not be able to buy food. They face mass starvation. Hundreds of thousands live on the brink in Somalia, Sudan, Congo, and South Africa. All of Asia lives on the edge. A full one billion human beings worldwide cannot secure a clean glass of water daily.

(In Peru, people live by the skin of their necks daily. For one year, I bicycled the entire length of South America to see poverty extremes that most people in the US and Europe cannot conceive. It's worse in India and Bangladesh times 100. Yet, those countries accelerate their human populations without end.) *Photography by Reuters.*

Nonetheless, political leaders of the world, religious leaders of the world and the developing countries of the world refuse to take action. The human mob accelerates without a word from NBC's Brian Williams, ABC's Diane Sawyer or CBS' Scott Pelley. ABC's David Muir raced

around Somalia last year when 100,000 children faced immediate starvation—but that crisis quickly lost the public eye and the children continued starving.

How Many Refugees Are in the World? According to www.brycs.org , a 2009 report by the United Nations refugee agency (UNHCR), 42 million people around the world were uprooted from their homes due to conflict or persecution. Of this number, 16 million were considered refugees, while 26 million were displaced within their own countries or were considered asylum-seekers in other countries. Approximately 45% of the world's refugees are under 18-years-old. About 80% of the world's refugees are hosted by developing countries. The largest refugee producing countries at present include Afghanistan, Iraq, Somali and Sudan, while Colombia, Iraq, Sudan and the Democratic Republic of the Congo have the largest internally displaced populations.

Some estimates by the UN show in excess of 50 million refugees looking for a new country to move to by 2050. A recent survey found:

More Than 100 Million Worldwide Dream of a Life in the U.S.

More than 25% in Liberia, Sierra Leone, Dominican Republic want to move to the U.S. See: http://www.gallup.com/poll/161435/100-million-world-wide-dream-life.aspx

However, no one ever asks the most logical question: when will the immigrant line to First World countries end? Answer: the line grows by 80 million net gain annually, which means the line never ends, but grows and grows and grows.

(On out outskirts of hundreds of modern cities like this one *(pictured this page)* in South Korea, you see millions living in slums. Millions trashing the waterways with their filth and human waste. Yet, no one takes action to stop the proliferation of human population explosion. In fact, the Pope and Islamic churches encourage more births no matter how much misery.) *Photography by Reuters.*

Since developing countries refuse to engage birth control for cultural and religious reasons, they use First World countries for a human exhaust valve. But, at some point, countries like the United States, Canada, European countries and Australia will exceed their carrying capacity—resulting in water shortages, food crises, energy depletion and resource exhaustion.

Africa, India, Indonesia, Mexico, the Middle East and Bangladesh continue growing their populations without pause.

As soon as their refugees flood into First World countries, those refugees grow their carbon footprint impact, water footprint, energy footprint and ecological footprint 10 to 30 times greater than they impacted the environment in their native countries.

(I remember my travels through Hong Kong where millions of people live in 100 square foot "coffin" apartments. You cannot even imagine the human degradation of spirit when you live in a 100 square foot apartment. We must ask ourselves how far into dehumanizing the human race we want to tread via endless population growth.)

Thus, nothing gets solved and *(Continued next page.)*

everything consequential happening to the planet accelerates. Therefore, Graham spelled it out in his quote: "…but to absorb our global brothers and sisters until their horrid ordeal has been endured and shared by all—ten billion humans packed onto an ecologically devastated planet."

First world countries must ask themselves if they want to tread that path? Can the United States sustain the projected 100 million immigrants within the next 36 years—by 2050? Why should it? What will it mean to quality of life and standard of living? What will it mean as to water supplies and energy? Answer: it's all headed into the toilet faster than a bullet train.

From my world travels to all those places facing human chaos, I can unequivocally state that the United States, Canada, Europe and Australia stand on the edge of a demographic cliff. They cannot and will not save those developing world countries from their own fecundity folly, but, if they continue immigration without pause—those first world countries will surely sink into the abyss of the same conditions that the refugees fled.

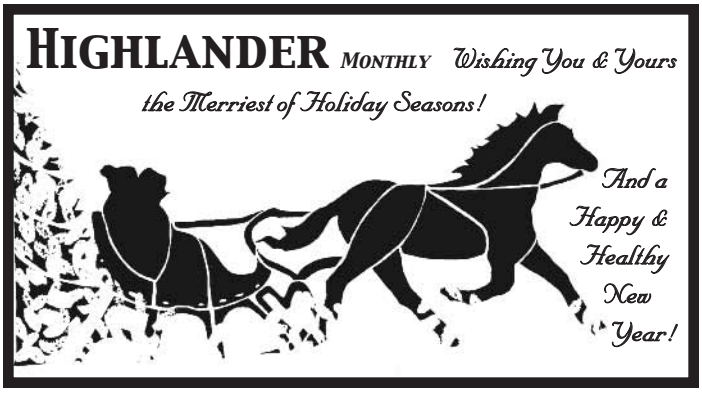
At some point, the United States must take stock of its path. It must decide on its future. On the current path, it faces demographic disaster. That's a mathematical certainty. It's only a matter of time.

If you would like to make a difference, please join these organizations for the most effective collective action you can take:
www.CapsWeb.org ;
www.NumbersUSA.org ;
www.TheSocialContract.com ;
www.Fairus.org

Frosty Wooldridge has bicycled across six continents - from the Arctic to the South Pole - as well as ten times

across the USA, coast to coast and border to border. In 2005, he bicycled from the Arctic Circle, Norway to Athens, Greece. In 2014, he bicycled coast to coast across America. He presents ***The Coming Population Crisis facing America: what to do about it.***

www.frostywooldridge.com . His latest book is: ***How to Live a Life of Adventure: The Art of Exploring the World by Frosty Wooldridge****, copies at 1 888 280 7715/ Motivational program: How to Live a Life of Adventure: The Art of Exploring the World by Frosty Wooldridge, click: www.HowToLiveALifeOfAdventure.com*



From Saltwater To Drinking Water

By Jeremy Miller

On the expansive beaches of California's central and southern coasts, with the state mired in its worst drought in history, one is reminded of Samuel Taylor Coleridge's ancient mariner. There is ocean aplenty – water, water, everywhere – but not a drop to drink.

Now, several coastal communities are looking at all that seawater as a possible source of drinking water. Desalination has been on California's radar since the 1960s but came to the fore in the mid 1970s, as severe drought aligned with a leap forward in technology. Industrial-scale treatment of brackish and salty water was made possible by improvements in reverse osmosis technology, a technique in which water is passed through a semi-permeable membrane to remove dissolved salts and other solids.

By the mid-2000s, according to a report from California State University's Center for Collaborative Policy, there were 16 small desalination plants – capable of treating between 2,000 and 600,000 gallons per day – supplying drinking water to communities across the state. But economics and environmental concerns have proven to be stumbling blocks to large-scale desalination, as numerous plants have been proposed and never built or shuttered outright.

Today, however, with growing populations and rapidly dwindling surface and groundwater supplies, desalination is getting a serious second look. More than a dozen desalination plants are in the planning phases along the California coast – from Santa Cruz in the north to Carlsbad in the south.

The wealthy seaside enclave of Santa Barbara, for example, is in the midst of a plan authorizing $32 million to reactivate its Charles E. Meyer desalination facility after nearly 20 years offline. The facility, which can treat 5,000 acre-feet of water per year – about 20 percent of the city's total supply – was built after a prolonged dry period in the late 1980s. But the plant was taken offline in the mid 1990s after precipitation increased and less expensive water sources again became available.

Just outside San Diego, the finishing touches are being put on the $1 billion Carlsbad desalination plant, which, when brought online in 2016, will be capable of delivering 56,000 acre-feet annually – or 50 million gallons of water per day – to residents in the San Diego region. Recently, the Metropolitan Water *(Continued next page.)*

District, which serves 19 million people across the Los Angeles and San Diego metro areas, approved a plan to increase subsidies for various types of water projects, including desalination plants. "Ongoing and new efforts to locally produce these resources and lower water demands plays a fundamental role in our long-term water plan," said Metropolitan board chairman Randy Record in a press release. "However, the costs to develop and maintain these supplies are a significant hurdle to initiating new projects."

While desalting plants have become more efficient, costs are still high when compared with other methods of delivering water. According to data from the UC Davis Center for Watershed Sciences, costs for desalination can run between $500 and $2,500 per acre-foot compared with, say, $300 to $1,300 per acre-foot for the treatment and reuse of municipal effluent. Most of this energy would come from the combustion of fossil fuels, which, critics note, would release vast amounts of carbon into the atmosphere – further contributing to the state's warming temperatures, dwindling snowpack and vanishing water supplies. However, Heather Cooley, director of the Pacific Institute's Water Program, determined that the amount of energy it takes to desalinate an acre-foot of seawater is comparable to the amount of energy required to pump an acre-foot of freshwater through the aqueducts of the State Water Project – from the Delta, east of San Francisco to southern California.

Desalination also generates large volumes of ultra-saline brine, which must somehow be disposed of. In Saudi Arabia – where desalination provides as much as half of the country's water supply – outfalls from de-salting plants dump brine directly into the ocean and have been blamed for increased salinity of the Arabian Gulf and degradation of coastal ecosystems. (To minimize impacts, the Carlsbad plant's permit requires the facility blend its brine in a five to one ratio with seawater before discharging it back to the ocean.) *(Photo of Carlsbad Plant, S. Calif. in 2013.)*

Beyond the immediate environmental and economic concerns around desalination are serious issues of scale. In spite of calls for desalination to replace water imported from elsewhere, it's clear that a large-scale transition to desalination would have profound impacts on the coastline of southern and central California. "To replace half of the water Metropolitan Water District gets each year from the Delta," wrote Nancy Vogel, a spokeswoman for the Department of Water Resources, "would require construction of approximately a dozen plants the size of the Carlsbad facility in the MWD territory – about one every 13 miles along the coast from Malibu to San Diego."

As California's coastal communities push into what seems to be an increasingly water scarce future, will they be forced to don this albatross to meet their water needs? Or can California's push for efficiency and more careful monitoring of its surface and groundwater boost supplies, and make large-scale desalination unnecessary?

Jeremy Miller is a contributing editor for HCN.

Dear Forest Service...

By Ben Long

The U.S. Forest Service has waltzed into a political minefield over its requirement that journalists and bloggers obtain permits in order to shoot pictures and video in congressionally designated wilderness areas. Now the agency appears unsure of where to step next, afraid of triggering another explosion.

Here is some friendly advice to the Forest Service: Abandon course. Scrap the permit system. Let people take all the images they want in wilderness areas and share them far and wide. In fact, start encouraging photographers and videographers to visit wilderness instead of throwing up bureaucratic, legalistic obstacles.

Scores of irate bloggers and reporters have already pointed out that, thanks to the First Amendment, the government doesn't get to decide what is a legitimate journalistic outlet or what stories are newsworthy.

But I'd like to make a different point. And that is that the American wilderness system itself can benefit greatly from the power of imagery. The mass media should help open the door that introduces people to their wilderness. The images they create can serve as the key.

As our population grows more urban, fewer and fewer Americans have a personal connection to wilderness. That means that wilderness has fewer political advocates for everything from adequate budgets for trail maintenance to new and much-needed wilderness protections.

For several years, I made my living as a journalist and often wrote about my travels in wilderness areas. My wife's photographs accompanied my magazine articles and book chapters, and often made the sale and grabbed the readers' eyes. There was nothing new about this.

Way back in 1861, a photographer named Carlton Watkins sent President Abraham Lincoln a collection of remarkable landscape photographs of Yosemite Valley. They helped convince Lincoln to take the initial steps to secure Yosemite for the public good.

More famously and more recently, Ansel Adams shot haunting landscapes of Mount McKinley and El Capitan in black and white in the 1940s-'60s. When I was a kid, I read articles by writers like Ted Trueblood about wilderness in Field & Stream Magazine. That was how I was introduced to the entire concept of wilderness — and eventually into a lifetime of advocacy.

Today, I have friends trying to do the same thing, filming their hiking, paddling, horseback rides or hunting and fishing trips. They take pictures and tell stories. The only difference between what they want to do, and what people like me and Trueblood and John Muir did, lies in a matter of frames per second and the artists' methods of distribution.

Today's video equipment is perfectly compatible with preserving the wilderness character of the land itself. Cameras are smaller and less obtrusive with each generation.

Like all visitors of the public lands, videographers and photographers should follow the rules to respect the rights of other wilderness travelers and limit their impacts. The Forest Service should make sure they do this. The agency has legitimate authority to limit obtrusive tools like drones or strobe lights.

But the Forest Service should also make sure that Americans in all places have a chance to see the majesty of a grizzly bear digging for marmots in the Bob Marshall Wilderness, or glimpse the stunning clarity of the water flowing in the Frank Church-River of No Return, even if only on the screen on their smartphone.

Since the days of Gutenberg, mass media have been dominated by the printed word. That's changed today. Users are uploading a billion pictures on the Internet every day. The Department of the Interior has more than 300,000 followers on Instagram, the social media platform specializing in sharing images. If the Forest Service wants wilderness to remain relevant, people need to be free to take and share of it, not just words.

The Forest Service has a mission: to "care for the land and serve the people." The agency should recruit image-makers and storytellers to help them do that job, not make it harder.

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DECEMBER
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POWER UPDATE

Space Heater Safety

As temperatures drop this winter, many will look for supplemental heating sources for their homes. Space heaters can be a good alternative for those who want to warm one area of their home, however, space heaters are also responsible for 32 percent of house fires, according to the National Fire Protection Association. If you are planning to use a space heater in your home this winter, review these tips to keep you, your family and your property safe.

Materials: What are the components of your space heater made of? Parts like metal grating can be hot to the touch and may burn anyone who gets too close.

Placement: While it can be tempting to place a small heater on a shelf so it is not in the way of pets and children, it is safest to leave the heater on a level floor on a nonflammable surface. The most important rule about space heater placement is the three-foot rule. Whether you are using the heater in the bedroom, living room or kitchen, space heaters should always be kept three feet away from flammable materials and out of the way of children and pets.

Special Features: Does your space heater have an auto shutoff function if tipped over? Auto shutoff can be a lifesaver.

Cords: You should never use an extension cord when plugging in a space heater as it can cause overheating. The space heater should be plugged directly into a wall outlet, and should be the only thing plugged in to the wall outlet.

Use: Never leave a heater unattended while in use. If you are leaving your home or going to bed, make sure to unplug the heater.

Following these tips and making sure to follow the manufacturer's instructions can keep you safe this winter.

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June 11-18, 2015

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