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Wolverine Denied: Endangered Species Listing

By Sarah Jane Keller - High Country News

In the dead of winter, female wolverines dig elaborate, multi-chambered dens to raise their young, choosing sites where snowpack lasts well into the spring. But snowpack in the Northern Rockies is almost certain to decline as the climate warms, jeopardizing their chances for successful reproduction. There are fewer than 300 wolverines in the Lower 48, and models show that they could lose 31 percent of their habitat by 2045 and 63 percent by 2085. And so, in February 2013, the U.S. Fish and Wildlife Service proposed adding the "mountain devils" to the endangered species list.

The science behind the proposal has not changed, but the agency's position on it has. Mountain-Prairie Regional Director Noreen Walsh advocated against a speculative listing in a memo released by environmentalists in July, citing uncertainty as to exactly why wolverines need a persistent snowpack to reproduce and how its loss would harm the animals. Though scientists recommended listing wolverines as threatened, agency leader Dan Ashe defended her position – a strong indication of which way the final decision would go, which was recently denied.

Wolverines would have been the first species in the Lower 48 thrust onto the endangered species list by climate change. A listing would have helped validate the use of climate models to develop strategies to protect animals against future threats. And it would have been unusual because, unlike most of the species the act safeguards, wolverines, though rare, are not thought to be declining. Idaho, Montana and Wyoming – the states that anchor the animal's range in the Lower 48 – dreaded the prospect of a listing and the public-land restrictions it could bring, while environmentalists cheered it on. In practical terms, though, would formal protections really help wolverines? Can a law that was designed to rescue species from discrete, localized threats also protect them from the more diffuse hazards of a warming world?

The Endangered Species Act has helped prevent the extinction of many species of plants and animals by removing specific threats to their survival, often only in areas designated as "critical habitat." Closing forest roads in prime grizzly habitat, for instance, helped keep poachers and stressful traffic at bay. Prohibiting the hunting or poisoning of wolves after they were reintroduced to the Northern Rockies allowed populations to rebuild. Restricting timber harvests in the Pacific Northwest took pressure off the northern spotted owl.

But the Fish and Wildlife Service *(Continued next page.)*

can't simply rope off high mountain niches, exclude greenhouse gases and preserve the snow that wolverines depend on. Polar bears, bearded seals and ringed seals are already listed due to disappearing sea ice, yet carbon emissions continue to rise, and the Arctic is still melting.

The Center for Biological Diversity, which has sued for greater wolverine protection, wants the Fish and Wildlife Service and the National Marine Fisheries Service to include specific emissions targets in the plans they create to recover species threatened by climate change "to raise awareness about what these species need," says Shaye Wolf, the center's climate science director. But using the act to reduce greenhouse gases would be politically and practically impossible, argues J.B. Ruhl, a Vanderbilt University professor specializing in endangered species law. Scientists couldn't prove that a particular

Wolverines, already scarce, could lose nearly a third of their habitat by 2045, due to climate change. Stock image courtesy Idaho Department of Fish and Game.

coal-fired power plant is responsible for the demise of polar bears, for instance. Plus, the idea has never had support in the agencies or the White House.

Still, listing species threatened by climate change isn't pointless. Recovery plans lead to basic conservation measures, such as long-term, range-wide monitoring of endangered populations and their habitats. Such unglamorous science is crucial to understanding what can be done to help at-risk species; it's not being done for wolverines, which are elusive and scarce, thus difficult and expensive to study. Insufficient funding for wolverine research also means that any decline in the population or devastating habitat changes might not be noticed until it's too late.

Additionally, the act includes an allowance for the introduction of "experimental" populations, which carry fewer land-use restrictions than existing populations that are declared endangered or threatened. In Colorado, wildlife managers have discussed introducing an experimental wolverine population for years. Trapping and poisoning wiped out wolverines in Colorado in the early 20th century, but its mountains could provide a snowy stronghold into the future. Now, however, the state is reluctant to reintroduce a species that could later become officially endangered.

Though few species have been listed primarily because of impending climate change, 66 percent of recovery plans now recommend action to cushion the impacts of warming. Of those, about 17 percent mention reducing greenhouse gas emissions, about half recommend monitoring, and most suggest actions to help species adapt, according to Wolf. These are incremental steps, but necessary to maintain the act's relevance in a warming world.

In the future, the Fish and Wildlife Service could take more creative approaches, like setting aside critical habitat that may not be ideal today, but could be essential tomorrow. Another option is to protect corridors that would allow species to move to friendlier climes as their current homes become less hospitable. The Endangered Species Act, explains Ruhl, hasn't solved traditional problems such as urban sprawl or invasive species – but it's helped species survive them. Similarly, the act must be used to address the effects, if not the causes, of a warming planet. "I think fundamentally this is about trying to help species to adapt to climate change," he says. "That's what the Endangered Species Act can help us do best."

Editor's Note: Some states welcomed this decision so that trapping these prized pelts can start again. The wolverine was hunted to extinction in Colorado in the past and while our snowpack may be its only safe place to survive, it seems likely it will not have any safe haven until they find a place on the Endangered Species List.

How Much Is A Healthy Ecosystem Worth?

By Wyatt Orme

For the 95,000 or so people in and around Bellingham, Washington, the water bill they pay every other month includes a charge called the "watershed acquisition fee." It's currently $24.81 per bill, and the city uses this money to strategically purchase land to protect Lake Whatcom and its watershed—the source of the city's water supply. Since the project's inception in 2002, the city has used taxpayer dollars to purchase roughly 1,700 acres, mostly from private property owners. If need be, city crews and volunteers clean up the parcels, then replant native forests, which in turn reduce pollution.

Through the acquisition fee, Bellingham's residents invest directly into their ecosystem. They reduce the amount of nutrients in the lake, like phosphorus, preventing the proliferation of harmful algae. Of all the strategies employed, like storm water vaults and other infrastructure schemes, buying and reforesting land has made the most long-term economic sense, says Clare Fogelsong, the natural resources policy manager at the City of Bellingham. Mainly, once the property is acquired, "you don't have any maintenance and operation costs," he says. "When you buy property, you avoid all future costs." In addition, a natural watershed has more longevity than a built system of pipes.

While novel, Bellingham's model has plenty of precedents. Seattle owns the Cedar River Watershed, which supplies its water; New York City owns large portions of its water source in the Catskills. Both cities meet quality standards without filtering. This is not to suggest that placing value on healthy ecosystems is limited to municipalities, either. The newest version of FEMA's computer software, Version 5.0, factors in environmental benefits to the cost/benefit analysis done for certain projects they consider funding.

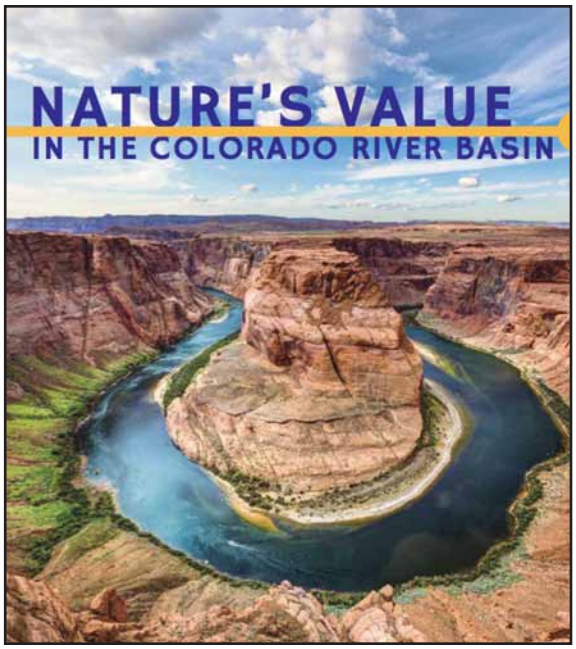
All of these models acknowledge that water quality depends on the health of an entire watershed. And the price for this ecosystem service seems to be worth paying because, in lieu of a healthy watershed, the cities would have to find other, perhaps more costly, ways of providing clean water. Assigning monetary value to these services—water being the most obvious example—has recently been gaining traction amid planners, economists and many others. Some are starting to zoom out even further, looking beyond watersheds to entire river systems.

David Batker is the chief economist and co-founder of Tacoma-based think-tank, Earth Economics, which recently completed an appraisal of the Colorado River Basin, the largest of its kind. There is a real dollar value to healthy natural systems, he says. After all, "the pipes are useless with no water."

If you did value nature for the services it provides economies, how much would it cost? "Like a business appraisal or a house appraisal, we're looking at an asset that provides benefits," Batker says. The Basin is defined by nearly 249,000 square miles spanning mountains, plateaus and valleys. About 40 million people depend on the system for drinking water, including people living in Los Angeles and Phoenix. Each year, agriculture diverts about 78 percent of the flow (almost 4 trillion gallons of water). The mining industry uses over a hundred million gallons from the basin every day.

According to Earth Economics, the Colorado River Basin

is worth somewhere between $69.2 and $496.4 billion dollars annually. In valuing the basin, Earth Economics hopes, foremost, that those who use the Colorado will recognize its extraordinary economic value and will find ways to invest back into it, like Bellingham, Seattle and New York.



The appraisal divides the Colorado River Basin into sections. Within those sections, Batker and his team poured over academic literature and applied traditional methodologies to measure the "ecosystem services," such as potable water, irrigation water, food, raw materials, recreation, water and air quality, and aesthetic value. The agricultural sector's annual water use throughout the area's seven states amounts to between $1 and $1.6 billion, while municipalities and industry use somewhere between $15 and $43 billion. Recreation in Lake Powell produces $241 million every year, so on and so forth.

They got into more complicated economics to measure the dollar value of water and air quality. Based on a study, the team estimated that each acre of forested land near cities provides over $230 per year in pollution removal, which is important for cities with rising rates of asthma. Healthy forests remove harmful pollutants, resulting in less asthma and, thus, avoided medical expenses. The same idea goes for water quality. In the case of New York City's watershed, healthy forests filter their water, which they would have to treat otherwise. These forests, then, are valued at the amount it would cost the city to build and operate a filtration plant.

Ultimately, the report recommends assigning monetary value to ecosystems with the aim of facilitating investment in "natural capital," like river systems, forests, grasslands, and wetlands. Investment would mean putting money back into managing the ecosystems that provide those valuable services. To "invest," Los Angeles and Phoenix would pay a "natural capital charge" on water bills, much like in Bellingham, which would be reinvested into the Colorado River Basin to protect water supply and quality.

One side note about the report: Batker claims the numbers provided are all something of an underestimate. There were plenty of valuable services the report didn't take into account, like groundwater. He and his team also were not able to come up with numbers for slightly more abstract aspects of the basin, like it's cultural value.

Regardless, the hope is that values in this report provide incentive for investing in healthy landscapes because, Batker says, if we lose these services, "we'll have to stir up the money to replace them."

Wyatt Orme is an editorial intern at High Country News. He tweets @wyatt_orme.

Buffalo Field Campaign ~ www.buffalofieldcampaign.org

Yellowstone National Park and other government agencies behind the Interagency Bison Management Plan (IBMP) are planning to slaughter 900 buffalo this coming winter under the guise of "disease risk management" even though there has never been a documented case of a wild bison transmitting brucellosis—a bacterial disease that affects livestock and wildlife—to cattle.

In an effort to avert the bloodshed, Friends of Animals (FoA) and Buffalo Field Campaign filed an emergency rulemaking petition Sept. 15 with the National Park Service (NPS) and the U.S. Forest Service (USFS) to protect the genetic diversity and viability of the bison of Yellowstone National Park. They are requesting that the NPS and USFS undertake a population study and revise the IBMP to correct scientific deficiencies, make the plan consistent with the best available science, and follow the legal mandates the U.S. Congress has set.

Until then, the groups are also requesting that the capture, removal or killing of bison at Stephens Creek area of Yellowstone National Park and Horse Butte area of the Gallatin National Forest be prohibited. We also want to send out huge thanks to everyone who took the time to send in comments on the Park Service's proposal for operational quarantine, which would be devastating to America's last wild buffalo populations.

We hope that our collective voice opposing quarantine will encourage the Park Service to choose the "no action" alternative and abandon the dangerous plan.

WILD IS THE WAY ~ ROAM FREE!

We are very pleased to announce that BFC's 2015 Wild Bison of Yellowstone Country calendar is now available! As you have come to expect, this 2015 Wild Bison calendar is a joyous celebration of this awesome animal, with breathtaking photos, interesting facts, inspirational quotes and poetry, and beautiful artwork. We are thrilled to bring you more photos from some of the best photographers both familiar and new, including the incredible images you have come to love from Sandy Sisti, Pam Talasco, Ric Kessler and for the first time, largely featuring the fantastic photographs of Tom Mangelsen. Celebrate the Wild Buffalo of Yellowstone Country 365 days a year!

ORDER YOUR 2015 Calendar NOW!

Elk Rut - Cub Scouts - Jenny Creek - Clothing Swap

Dear Editor,

I have a few reminders for readers while they enjoy our beautiful fall weather and watch elk during the rut. Harems are gathering in the meadows in the peak of the mating season. Rocky Mountain National Park's prime elk viewing areas are: Moraine Park, Horseshoe Park, Upper Beaver Meadows, Harbison Meadow and Holzwarth Meadow. Observe the posted signs for meadow closures between 5 pm and 7 am. Turn off your car lights and engine after parking. A bull that had had enough of car noise, repeatedly attacked cars last season, doing a lot of damage. Park personnel had to sedate him, and remove his antlers, which saved future car damage but also benched him from the mating game that season. We want to keep their environment calm and natural so don't whistle or shine lights for that best photo opp. The bulls can lose 25% of their body weight during the rut and if they don't regain some of that loss, they might not survive the winter. If an elk raises its head or moves because you are in the vicinity, you are disturbing it. Leave your dogs at home. I watched a bull charge a parked car with a barking dog making its presence known through a half open window. Dogs are viewed as predators and bulls have increased testosterone at this time, which makes them more aggressive. A wise ranger once told a couple of young men intent on approaching a harem, "That bull has two things on his mind: mating and fighting. Just be prepared to do one or the other." The men backed off. The bulls are defending their harems night and day, not eating much and not resting. That would make any guy crabby. They are most active in the late afternoon and early evening so go and enjoy these majestic animals and listen to their soulful bugling at a safe and respectful distance. Thanks! Diane Bergstrom *(photo is of a bull displaying herding posture in RMNP)*

Letter to the Readers,

CUB SCOUT PACK 51 UPDATE - As you read this, our Coal Creek Canyon Pack 51 Cub Scouts will have had their Join Night (which was well attended! A big welcome to all our new boys and families!) and their first meeting. We started off with a bang by working on our service project - Books and Blankets. We made fleece tie-fringe blankets for patients at Children's Hospital and are collecting books to donate to them as well. If you didn't make it to Join Night or our first meeting, **it's not too late! Our next meeting will be Wed., Oct. 8th at 6:30 p.m. at the CCCIA Hall.** The pack will be doing lots of fun stuff this year and we don't want anyone to miss out.

The Cub Scouts will be hosting the Fall Clothing Swap at

the CCCIA Hall on October 21 & 22. It's Popcorn time for our Scouts! If you know a Scout, please order popcorn. This is how we raise most of our money for our activities, awards, etc. and our pack gets a healthy percentage of what is collected. So as the weather gets cooler, stock up on popcorn for those chilly nights! For questions please call Beth White at 303-642-1608.

Letter to the Editor,

Closure lifted for Jenny Creek Restoration and Motorized Trail Reroute Project - The Boulder Ranger District reopened the Jenny Creek area near Rollins Pass Saturday, Sept. 20, 2014. The area has been temporarily closed for creek and trail restoration work. The contract work was completed earlier than anticipated, allowing a shorter closure period.

The Jenny Creek motorized trail (FST 808.1) follows the historic Boulder Wagon Road, west of Rollinsville, Colo. Over decades of use, a portion of the trail located along the creek became severely damaged, eroding the creek and redirecting the creek channel onto the road. The Forest Service has rerouted this portion of the motorized trail away from the creek and reestablished the motorized trail. Additionally, mountain pine beetle infested hazardous trees along the new route have been removed. The final phase of this project was to repair the creek and restore the damaged riparian and adjacent uplands areas, and that work is now complete.

The reopening includes motorized access into the area on Forest Service Trail 808.1 (from Yankee Doodle Lake) and Forest Service Road 502.1 (from Rollins Pass Road). The Boulder Ranger District obtained a grant from the Colorado Parks and Wildlife Off-Highway Vehicle (OHV) program to complete the Jenny Creek motorized trail reroute and restoration work. The local Rising Sun Four Wheel Drive Club and the Trout Unlimited Chapter: Boulder Flycasters partnered with the Forest Service, supporting the project with volunteers and financial contributions. Rising Sun volunteers are assisting the Forest Service with removal of temporary closure signage and installation of new signage. Sylvia Clark, Boulder District Ranger.303-541-2532

Letter to the Readers,

The Coal Creek Canyon **Children's Clothing Swap** is almost here! The Clothing Swap will be hosted by and benefit the Canyon Pack 51 Cub Scouts. Please bring your clean, gently used children's clothing (size newborn to 14) and maternity clothes to the **drop off at the CCCIA Hall, on Tuesday, October 21 from 4:00pm-7:00pm.** With Halloween coming, don't forget to bring costumes to swap as well! Please do not bring dirty or ragged clothes. All the clothes that are donated will be used by local canyon residents or donated to local charities. We are also accepting other items related to children; but please do not bring games, toys or stuffed animals. Please contact Beth White (303-642-1608) if you have any questions or need a special drop-off time. Come help us sort on Tuesday, you can even have "first dibs" on clothing!

Then we hope you will join us on Wednesday, **Oct. 22nd from 3:30pm to 7:00pm at the CCCIA Hall for The Swap.** There will be a voluntary $3.00 donation at the door, but if that is a hardship, please come anyway. We ask you take only what you can use and do not sell or use any items for consignment.

We hope to see you there! We always end up with more donations than "shoppers!" See you there!

Beth White at 303-642-1608.

The Toxicity Of BPA Being Studied

Dear EarthTalk: A recent study showed that Bisphenol A (BPA) was hardly the human health risk researchers once believed it to be. Should I still try to avoid products that may contain it? — Carolyn Danes, Waukesha, WI

Some 93 percent of us carry traces of the synthetic compound Bisphenol A (BPA) in our bloodstreams, so it's no wonder that public health advocates are concerned about its potential effects. Developed in the 1950s to strengthen plastics and epoxy resins, BPA is today used in a wide range of products, including many plastic food and drink containers, the lining of most cans, some paper products, and dental sealants.

But with widespread use of BPA has come increased scrutiny regarding its potential impact on human health. **When ingested, BPA mimics naturally occurring human hormones and thus can potentially interfere with the body's endocrine and reproductive workings.** According to the nonprofit Breast Cancer Fund, previous research has linked BPA exposure to an increased risk for cardiovascular disease, miscarriages, decreased birth weight at term, breast and prostate cancer, reproductive and sexual dysfunctions, altered immune system activity, metabolic problems and diabetes in adults, and cognitive and behavioral development in young children. These concerns have led the European Union, Canada—and more recently the U.S.—to ban the use of BPA in baby bottles and other items geared toward babies and children.

Meanwhile, the U.S. Food & Drug Administration (FDA) maintains that typical low-level BPA exposure does not pose any health risk. A February 2014 study by FDA researchers found that low doses of the compound did not affect the health of rats over a 90-day study period. While study rats exposed to higher doses of BPA had lower body weights, abnormal female reproductive development and altered hormone levels, there were no such effects in rats exposed to lower doses more akin to what humans experience.

But critics point out some flaws in that study which call its conclusions into question. For one, a control group of rats that was supposed to remain unexposed to BPA somehow had levels of the compound in their blood equivalent to the lowest-dose study population. FDA researchers maintain that this contamination of the control group did not affect their results because neither group of rats showed any effects given their low-dose exposure. Another issue is that the researchers did not look at neurological effects such as changes in learning, memory and behavior.

"What needs to follow is whether these exposures are causing neurobehavioral changes," Harvard epidemiologist Joe Braun told Environmental Health News, adding that previous research has shown that estrogen receptors in the brains of rats were triggered by low doses of BPA. "Hopefully [the FDA] will address that down the road."

More research is underway still. The February 2014 FDA study is part of an ongoing two-year assessment of the toxicity of BPA. Dozens of university studies are also in progress to shed more light on just how risky our use of BPA may be. **Consumers should continue to take precautions to limit their intake of BPA by avoiding polycarbonate plastic food and drink containers and metal cans, and by refraining from putting plastic items in the microwave—a process that can expedite the leaching of BPA into food.**

Breast Cancer Fund, www.breastcancerfund.org; U.S. Food & Drug Administration, www.fda.gov; Environmental Health News, www.environmentalhealthnews.org.

earthtalk@emagazine.com.

Migrating Birds & More At Risk From 'Tar Sands'

Dear EarthTalk: How is it that migrating birds are being negatively affected by oil extraction in Canada's Boreal forest? — *Jennifer Chase, Fort Lauderdale, FL*

Each year tens of million of migratory birds "overwinter" in the Canadian Boreal forest, a vast tract of mostly uninhabited coniferous woodlands and wetlands stretching from Newfoundland to the Yukon. The area makes up some 60 percent of Canada's total land mass, and serves as the winter home for more than half of America's avian population. But environmentalists are worried about the impact of increasing "tar sands" oil development there and the impact it might have on wildlife populations continent-wide.

Tar sands are a mixture of sand, clay, water and a dense and viscous tar-like form of petroleum called bitumen. The bitumen is extracted from the tar sands mixture and eventually refined into transportation fuel like gasoline. The extraction process is especially "carbon-intensive" and generates some of the dirtiest fuel around, but its abundance makes it affordable as long as industry keeps turning up new sources.

A recently released report by the National Wildlife Federation (NWF) and the Natural Resources Council of Maine (NRCM) concluded that almost half of the 292 different migratory bird species that overwinter

Above: Canadian Warbler

in Canada's Boreal forest—as many as 75 million birds—are threatened by future tar sands development. Further, they say, bird losses in the hundreds of thousands have already taken place as a result of overzealous and under-regulated oil development there to date.

"The direct and indirect impacts to birds from tar sands development are immense," states the report. "Waterfowl and shorebirds land in tailings ponds that they mistake for natural water bodies and become oiled with waste bitumen and toxic elements." The result can be birds drowning, dying from hypothermia or otherwise suffering from the ingestion of toxins. "Toxins from the tailings ponds and other pollutants from tar sands operations leak millions of gallons of toxic liquid waste into wetlands and forests each day, further contaminating habitat," the groups add.

Tar sands development also contributes disproportionately to climate change. U.S. State Department analysis shows that tar sands oil is 20% more carbon pollution intensive than conventional oil on a "well-to-wheel" basis. The effects of global warming on Canada's Boreal forest are likely to include shifting food supplies, increasing numbers of damaging wildfires in forests, more droughts in wetlands and potentially dramatic

changes in vegetation and the relationships between predators and prey.

Environmentalists would like to see U.S. lawmakers deny permits for the transport of Canadian Boreal tar sands oil—most of which is extracted in land-locked regions—through the U.S. in hopes of making future tar sands projects there too expensive to be worthwhile.

"Saying no to tar sands is a critical pillar in an effective strategy to protect wildlife from carbon pollution," says NWF. Furthermore, given Americans' growing desire to get away from costly and polluting foreign oil, it makes sense to pass on adding dirty tar sands oil to the mix. But it remains to be seen if the Obama administration will allow construction of the controversial Keystone XL pipeline to transport the oil from Canada through the U.S. The welfare of millions of birds—and, indeed, our energy future—is at stake.

NWF, www.nwf.org; NRCM, www.nrcm.org.
earthtalk@emagazine.com.

Editor's Note: Greenpeace is calling on oil companies and the Canadian government to stop the tar sands and end the industrialization of a vast area of Indigenous territories, forests and wetlands in northern Alberta.

The tar sands are huge deposits of bitumen, a tar-like substance that's turned into oil through complex and energy-intensive processes that cause widespread environmental damage. These processes pollute the Athabasca River, lace the air with toxins and convert farmland into wasteland. Large areas of the Boreal forest are clearcut to make way for development in the tar sands, the fastest growing source of greenhouse gas emissions in Canada. Greenpeace is also concerned with the social and health costs of the tar sands. First Nations communities in the tar sands report unusually high levels of rare cancers and autoimmune diseases. Their traditional way of life is threatened. Substance abuse, suicide, gambling and family violence have increased in the tar sands. Meanwhile, the thousands of workers brought in by oil companies face a housing crisis in northern Alberta.

Enbridge Inc.'s tar sands tanker pipeline proposal threatens to allow a 30% expansion in tar sands development. Enbridge's tar sands pipeline would span 1,170 kilometres from Hardisty, Alberta to Kitimat, in the Great Bear Rainforest in British Columbia. Over the past decade, Enbridge's own pipelines spilled an average of more than once a week. The pipeline would cross over 1,000 rivers and streams and the Rocky Mountains on the way to B.C.'s pristine coastline. The pipeline would bring more than 200 crude oil tankers through some of the world's most treacherous waters each year. *(Canadian Greenpeace, photo credit to John Woods of Greenpeace.)*

At Ease By A Creek In The Wilderness

By Charles Finn

I am on my way to Kootenai Creek, a neighbor and laughing friend who spends all day, all year, all everything, tumbling down the western side of the Bitterroot Mountains in southwestern Montana.

This is the edge of the Selway-Bitterroot Wilderness, over a million acres of forest that stretches between Montana and Idaho. Kootenai Creek empties into the Bitterroot River, which in turn empties into the Clark Fork River, which then swells the Columbia River for its long journey to the Pacific Ocean. I'm not sure that my creek has any thoughts of the sea, but I imagine there's not a brook or stream in the world that doesn't yearn for a lake, dreaming of the day it can fan out, rest in the open, caressing and supporting the bellies of fishes.

As always when I enter the woods, I step into an immense and ancient privacy. This is where the weighty and important decisions are made, where life and death hang in the balance, with the soil, the cleansing of the water, and the rejuvenation of air. Kootenai Creek is not wide — 6 feet to 12 feet in most places — but its acoustic gymnastics are subtle and grand.

I believe it is a mistake to talk of the monotonous voice of a river or stream, worse yet to say that a brook babbles. A brook is fine literature, poetry of the first order, and if I had to guess, I'd say Kootenai Creek is reciting James Joyce, perhaps, even William Blake. In my mind there's no more important vocabulary than that of running water, a continual talker. Kootenai Creek is also well-versed in the patterns of weather. Listen closely, and every landing of leaf and insect becomes a clause, a comma, or a word in the story. Every deer wading in for a drink is indenting a paragraph.

There are so many qualities of sound that come from this one stream, so many choral differences as it steps down the stones. There are the guttural, throaty undertones of its intense hiss. There are the small, individual drops that leap out of the spray, and larger drops, too, that plunk, plop and thunk louder.

Today, Kootenai Creek raises its voice to an extreme but tender whisper. It pours under masses of roots and rumbles out from the dark. Everywhere in the creek are the broken ends of trees, slick, black-green arms that let the water rush over them. To the water's song they add a hint of

melancholy I hadn't noticed before.

Today, I am stalled by a creek, content to be a bump on a log, sitting out of the sun. It brings me a simple joy. My goal has not been to speak with this creek but to submerge myself, sink like a stone into a caring and genuine awareness of beauty. In the end, I've not heard a word I expected - not happiness, not peace. Instead, I've heard what all language, all literature, every breath of nature is repeating over and over until the very end: home.

I rise to leave. I take one last drink of water. To do this I lower my face close to the water, purse my lips. I kiss Kootenai Creek. I can see the smooth stones in the shallows. I can see the moss growing gently attached to their logs. In the rushing water is one moment of life. Then all is blurred. If not nature, who is my lover? If not in love, why not? I drink and breathe deeply. For a moment, all is bright and well in the world.

Charles Finn is a contributor to Writers on the Range, a column service of High Country News (hcn.org). .

Top Left: Poodle mix with proud owner.

Right Top & Bottom: Harley & Luke, nose to nose and best buddies.

Bottom Left: Some confusion about which bed belongs to which dog?

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

Top Left: Sassy & Rudy mowing the lawn, tough work if you can get it - while Chanel guards the herd.

Top Right: Somebody got in the mud....

Bottom Right: Looks like Rudy- not. Pony after something in a bucket.

Bottom Left: Guess who loves the new baby?

150 Years: The Continuum Of Sand Creek

Article and Photographs by Diane Bergstrom

If you read no further, get through the first paragraph. The American scholastic system has grossly ignored historical constructs that created the framework for land ownership, not just in the United States, but all over the world. In 1452, Pope Nicholas V issued the Doctrine of Discovery, which decreed and encouraged Christian explorers to claim lands from non-Christian inhabitants (in many areas, Original Peoples) in the name of their monarchs. The lands could be taken and exploited, and the residents, if they didn't agree to convert to Christianity, could be enslaved or killed. It was a religious permission slip to conquer, claim and kill, during a time in Europe when there were three classes of people—clergy, nobility and peasants. The fundamental basis of power exercised by the Catholic church was even questioned by German peasants in the 1520's, who issued a statement, "We take it for granted that you will release us from serfdom as true Christians, unless it should be shown us from the Gospel that we are serfs." They were inspired by Martin Luther's challenge to the church and condemnation of papal abuses, and revolted against their own socio/economic conditions. Luther advised the secular powers to crush the peasants rebellion. After the Revolutionary War and War of 1812, American nationalism was on the rise and many settlers moved west to set up homesteads. Gold had been discovered in California and the US controlled all land between the Atlantic and Pacific oceans by 1850. Many pioneers, entrenched in their own ideas of American culture and racial superiority, believed that it was America's divine obligation to expand its boundaries and "civilize" the inhabitants. American missionaries believed they would save souls. A newspaper editor in

1845, John O'Sullivan, coined the term "manifest destiny" to describe the mindset. While it might not have been American consensus, it was American imperialism, and rejected by powerful politicians including Abraham Lincoln and Ulysses S. Grant. But it still set a rhetorical tone that was used to go to war with Mexico in the 1840's. The concept was echoed by Colorado religious, military and political leaders in 1864 to justify a massacre of peaceful Arapaho and Cheyenne people, who were told, and believed, that they were under the protection of the US Army at Sand Creek.

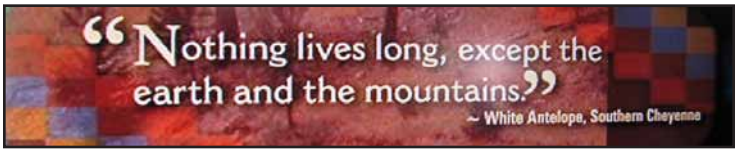
November 29, 2014, will be the 150th anniversary of the massacre. In 1860, Colonel John Chivington came to Colorado as the presiding elder of the Methodist Episcopal Church of the Rocky Mountain District, and was nicknamed the fighting Parson, leaving the pulpit for military life. Margaret Coel, in her book, ***Chief Left Hand*** wrote, he viewed Indians as less than human and led the Third Regiment of the Colorado Volunteer Cavalry, approximately 700 soldiers, in an attack on the peaceful encampment of Cheyenne and Arapaho at Sand Creek,

about 175 miles southeast of Denver. Both the American flag and a white flag flew over the encampment, as they were told to do, to show they were peaceful and under the protection of the military. Among the approximately 200 killed were thirteen Cheyenne chiefs and one Arapaho chief, including White Antelope. The majority were women and children, some used for target practice. Chief Left Hand (Niwot) died a week later from his wounds. Possessions were looted, horses and ponies were killed, lodges were destroyed and bodies were mutilated. Capt. Silas Soule and Lt. Joseph Cramer of the First Colorado Volunteer Calvary realized that the attack was planned on Chief Black Kettle's peaceful Cheyenne and Arapaho village, other friendly Indians camped on Sand Creek and as Soule wrote, (he went to where) officers of the 1st and 3rd were congregated and told them that any man who would take part in the murders, knowing the circumstances as we did, was a low lived cowardly son of a bitch. When threats to hang him had no effect, Chivington lied to Soule and Cramer about their final destination. Upon arriving at Sand Creek and realizing the truth, Soule and Cramer ordered their men to hold their fire. The orders were followed, which allowed some people to escape, enabling life for current descendants. At the corner of 15th and Arapahoe streets in downtown Denver, on April 23, 1865, assassins shot and killed 1St Colorado Cavalry Officer Capt. Soule. Capt. Soule and Lt. Cramer couldn't have estimated the future important impact of their letters to Major Edward Wynkoop, detailing the incriminating events before, and the horrific acts during and after the massacre. Colonel Chivington and Territorial Governor John Evans both resigned. Patty Limmerick, Chair of the Center of the American West and author of ***The Legacy of Conquest: The Unbroken Past of the American West*** commented that, among their justifications, was the notion of what she termed inverted conquest, where the white settlers felt they were being invaded. Karen Wilde, National Park Service, commented that though the action was condemned by the US government, no one was ever prosecuted. Because the massacre happened during the time of the Civil War, an unusual investigation was made in Washington at the federal level. *(For my past articles, look under the Archive Pages at www.highlandermo.com, Jan/Feb/Mar/May, 2013.)*

The Sand Creek Massacre National Historic Site is located outside of Eads, Colorado, and managed by the National Park Service in cooperation with representatives of the Cheyenne and Arapaho tribes. Karen Wilde is the Sand Creek Tribal Liaison and works closely with the tribal representatives who are consulted on land and site management decisions. According to Karen, it is the only park unit that is designated as a massacre site. She explained the typical situation of working with tribes where tribal lands are adjacent to park land. In this unique situation, The National Park Service consults with named tribes who are significant to the site. Surviving Arapaho and Cheyenne escaped to Wyoming, Oklahoma, and Montana, where their descendants live today. On Saturday, November 29th, 1:00 pm, there will be a public event at the site with interpretive presentations given by NPS interpreters and subject matter experts. Tribal representatives could also be presenting. Attendees will have the opportunity to learn the tribal point of view and then experience the site in contemplative time. That evening, the local movie theater in Eads will show a documentary on the Sand Creek Massacre and the Civil War, with discussion following the film. Time to be determined. On Sunday, November 30th, the annual Sand Creek Massacre Spiritual Healing Run/Walk will start from the site monument and all are *(Continued next page.)*

invited to participate. There will be vehicle escorts so walkers/runners can participate at their own comfort and ability level. The walk/run starts at Sand Creek, with stops over the following three days, and ends in Denver, at the steps of the capitol, where representatives from both governments will make presentations. Anyone can meet the runners at the corner of 15th and Arapaho and escort them to the capitol steps. *(I highly recommend this along with the gathering at the capitol. Powerful presentations were made in the past and this year shouldn't be missed.)*

Rocky Mountain PBS will also broadcast a 30-minute corresponding special on November 27th. Check your local listings. The Boulder History Museum has brought back the award-winning exhibit, ***Chief Niwot: Legend and Legacy,*** and will have it open through 2015. The exhibit is largely based on Margaret Coel's book, ***Chief Left Hand***, and Ava Hamilton, Arapaho documentarian/historian/writer consulted on the design committee and found it to be one of the more historically accurate museum presentations. The museum is located at 12th and Euclid Streets in Boulder; www.boulderhistory.org; 303-449-3464. On October 7, there will be a public meeting headed by Sand Creek NPS Superintendent Alexa Roberts on the final plan for the site including the site's background and future vision. Check www.boulderhistory.org for time and place. On Saturday, October 11th, a one-day bus trip to Sand Creek leaves the Boulder History Museum at 6:45 am and returns at 6:45 pm. There will be a guided tour at Sand Creek and the cost is $50. For more information call 303.449.3464. On Wednesday, October 22, 7 pm, Bancroft Prize-winning author Ari Kelman will discuss his research and book, ***A Misplaced Massacre: Struggling Over the Memory of Sand Creek***. The program will be at the Museum of Boulder at 2205 Broadway Street. Cost is $10. On Wednesday, November 19, 7 pm, the 2nd Annual Chief Niwot forum, ***Congress Meets Sand Creek***, will also be held at the Museum of Boulder, 2205 Broadway, at the corner of Pine Street. Senator Ben Nighthorse Campbell and Congressman David Skaggs are featured.



Education and recognition are the first steps in not repeating history and healing from it. In June, Methodist Bishop Elaine Stanovsky, arranged for the Rocky Mountain Methodist conference to be held in Pueblo, so 650 attendees could not only absorb the Sand Creek history but also learn about the Methodist connection through former presiding territorial minister Chivington. Thirteen buses transported pastors and lay people, with a tribal representative on each bus to give a historical outline and answer questions on the way to Eads and Sand Creek. Ava Hamilton was one of them. Attendees also met with NPS Superintendent Alexa Roberts, Karen Wilde and Ranger Jeff Campbell, watched an informational video, and visited the site. To say it was a moving experience is a gross understatement. When several attendees asked Ava what else they could do, Ava not only advised them to understand American history and how the laws affected Indigenous people in the western hemisphere, but also suggested a global perspective and effort needed from all people in order to save the planet from human destruction and climate change. The lyrics of a Southern Arapaho song echoes her sentiment, "My Children, My Children, Here it is, I hand it to you, The earth, The earth." Then we will heal together.

Does New Policy Set Law Back?

By Judith Lewis Mernit

The cactus ferruginous pygmy-owl lives in the desert scrub and mesquite woodlands of central and southern Arizona, Texas and Mexico. It is a small bird with swaths of cream-colored feathers, measuring about seven inches long and weighing a little more than two ounces. *(See photo page 25.)* It eats insects, rodents and lizards, some of them as big as the owls themselves. It nests in the holes woodpeckers leave in saguaro and other cacti and trees.

And it has now become an emblem in a fight over the meaning of a five-word phrase that has dogged the 1973 Endangered Species Act the way "waters of the United States" has muddied the Clean Water Act. If a species, like the pygmy-owl, is at risk of being lost in "a significant portion of its range," does it merit protection even if the same species is holding on elsewhere? Or do the inhabitants of that "significant portion" need to be crucial to the entire species' survival?

Those are the questions the U.S. Fish and Wildlife and the National Marine Fisheries' Service, sought to address on June 27, when they announced a new policy to provide "consistency in the application of that phrase" as it applies to endangered or threatened species. Under the new policy, a species on the decline in "a significant portion of its range" can be listed as threatened or endangered only if that portion is crucial to the survival of the species' entire global population.

In other words, if the cactus ferruginous pygmy-owl will persist even after the species disappears from, for instance, the northern Sonoran Desert, the bird doesn't warrant protection.

It is not the clarification conservationists wanted. If the interpretation sticks, some say, the 1973 law will have fundamentally changed — reverted, in fact, to the 1966 Endangered Species Preservation Act that the 1973 law was written to improve.

"The 1966 law was deemed inadequate in part because scientists pointed out that actions taken only to prevent the complete extinction of a species were likely not to (work)," says Michael Paul Nelson, a professor and environmental ethicist at Oregon State University. "It defined 'endangered species' merely as 'species at risk of extinction.'

The phrase "significant portion of its range" allowed wildlife agencies to list a species whose numbers were diminishing in the U.S., even if global populations were stable.

In a recent New York Times editorial, Nelson and Michigan Technological University Ecologist John Vucetich argued that the new policy threatens to reduce the act to "a mechanism that merely preserves representatives of a species, like curating rare pieces in a museum." The bald eagle might never have merited protection were the policy in effect back in the 1970s; while hunting and DDT were decimating it, it still thrived in Alaska and Canada. The gray wolf wouldn't have been listed, either. The new interpretation of those five words has already been used in the process of delisting the wolf and to deny protection to the wolverine. And it has already contributed to the delisting of the cactus ferruginous pygmy-owl. The cactus ferruginous pygmy-owl's disappearance from parts of its northern range toward the end of the 20th century wasn't a mystery: *(Continued next page.)*

Development had surged in the northern Sonoran Desert. In 1997, when the U.S. Fish and Wildlife Service listed the bird as endangered, developers were livid.

"The bird's listing is 'dishonest,'" Alan Lurie, executive director of the Southern Arizona Homebuilders' Association, told Tony Davis, who reported on it for the High Country News. "Experts tell me the bird is prolific in Mexico (so) it is not truly endangered."

Lurie was partially right: The pygmy-owl was first listed on the grounds that it was a "distinct population segment" from the pygmy-owls on the Mexican side of the border, which it technically wasn't. Developers sued, and in 2006 the pygmy-owl's listing was overturned.

And yet the owl was clearly endangered in the northern Sonoran Desert. So the Center for Biological Diversity petitioned again for the bird's protection, arguing this time that it was "in danger of extinction throughout all or a significant portion of its range."

At first Fish and Wildlife agreed. "They actually drafted a proposed rule to list them, arguing for various reasons that we were right," says Noah Greenwald, endangered species director for the organization in Portland, Oregon. In that draft, which the Center for Biological Diversity obtained under the Freedom of Information Act, "the Sonoran Desert Ecoregion" was deemed "significant," and the listing of the pygmy-owl within it was warranted. Then something changed. "Two years later, they looked at that draft policy and said 'Nope, you're not right. Even if (the pygmy-owl) were lost in the Sonoran Desert, the species as a whole would be okay.' A new draft in 2011 claimed that the Sonoran Desert pygmy-owl's "contribution to the viability of the species" wasn't important enough to list it. The petition was denied.

It was the exact — and to Greenwald and Nelson, deeply flawed — interpretation Interior had been pushing for since 2000; the exact interpretation that had already been struck down by the Ninth Circuit in a case involving the flat-tailed horned lizard in 2001.

And it was the exact interpretation many conservationists were hoping the Obama administration would overturn, not support, in its clarification. "The policy itself is a

The cactus ferruginous pygmy-owl. Photo by Sky Jacobs, via Wikimedia Commons

political decision to try and limit the scope of the ESA," Greenwald says. His organization will likely sue again, on behalf of the pygmy-owl.

Michael Paul Nelson says the new policy also misses the point. "Many of us would suggest that the ESA is not only about preserving curiosities and the cabinets necessary for those curiosities, but about preserving the role that native species play within ecosystems," he wrote in an email from the field, where he's studying the impact of old-growth versus second-growth forests on fish.

The Obama administration's new policy states clearly that the Act is "only about preventing the complete extinction of a species, no more," Nelson says. "I would guess that the citizens of the United States, then and now, might have a very different answer."

Judith Lewis Mernit is a contributing editor for High Country News. She writes from Southern California and tweets @judlew.

Editor's Note: The change in this policy puts all threatened species at more risk due to the ecological and biologic need for enough of any species to maintain a viable and healthy gene pool. With fewer individuals in any species, breeding options become less able to avoid inbreeding and all the negatives that brings. In working to conserve species this factor is as important as saving them from extinction, in fact probably more, so they are healthy enough to reproduce the future populations.

The Ansel Adams Wilderness

The Ansel Adams Wilderness

By Peter Essick

Foreward by Jamie Williams, 112 pages, hardcover: $22.95. National Geographic Society, 2014.

For 25 years, Peter Essick traveled the globe as a National Geographic photographer, and recently he was named one of the world's 40 most influential nature photographers. In 2010, Essick began "a potentially controversial" project in his native California: shooting in Ansel Adams' Sierra Nevada and in his signature black-and-white style.

Paying homage to a master without imitating the work is a delicate balance to strike. Essick's results, though, are stunning. In ***The Ansel Adams Wilderness***, he captures groves of shimmering aspen trees and alpine lakes, whose calm surfaces perfectly mirror the granite formations and pine trees above. Quotes from Emerson, Thomas Cole and others, plus Essick's own notes, round out the book. Essick, like Adams, conveys a deep respect for his subject matter. And he defends his use of digital technology: If Adams were working today, he says, "he would have a similar model" of the latest camera, although "his would probably be better."

You Can't Take It With You

By Melissa E. Johnson

There are no U-Hauls behind hearses.

~John Piper

I thought about this as we drove away from my grandparents' home with a 6' x 12' trailer in tow, filled with their treasured antiques; secured for the drive from Virginia to Colorado. The beautiful hand-carved mahogany bed purchased just after they married in 1946—an antique when they bought it—that became the foundation from which their family grew. The gorgeous dresser with the marble top and crystal knobs; I had seen that piece in their home so many times before, yet I never knew it had a secret drawer! Charming. A pair of lamps with silk shades; a princess vanity with an oval mirror; an exquisite Morris Chair—the original recliner—with hand-carved lion heads adorning both sides at the top; a comfy rocking chair, and a couple of wood treasure boxes filled with antique tools that now belong to my husband.

It felt odd to go through their personal things, in a home that had been vacant for at least four years. Though spiritual and family-focused, they had lived a life surrounded by "things" that meant something mostly to them; some with sentimental value to a few family members, and a whole lot of junk. I imagine my grandparents would be thrilled to see their treasured antiques in our home; to know that we cherish them as they had. But my grandfather would no doubt be troubled by our lack of interest in his junk—Salvation Army this-and-thats; collections of brass and silver drawer pulls and hinges stored in small buckets on the shelves in his workshop, to be used for who knows what; an assortment of lamps, none of which work, but that I'm sure he intended to bring back to life. And so much more. As we lingered in that space, I moved between fascination and disgust—why do we need so much stuff? But mostly, I felt overwhelmed for my mother and uncle who have taken on the daunting task of making it all go away—by succession, sale, auction or trash. One way or another, the house will soon be sold.

Now in my home, these pieces precisely arranged, I vowed to my sweetheart to keep our "stuff" to a minimum. I started by cleaning out my closets. It's a challenge for sure, in this culture of consumption; where companies churn out the latest and greatest versions of what we already have, competing for our dollars by somehow convincing us that we need what they're selling. Consignment shops and antique stores abound, offering glimpses of someone's past and tempting us with their unique and interesting wares. But how much do we really need to be happy, to live a comfortable life? Where do we draw the line? How can we connect with our inner treasures and pass on accumulating more stuff?

We've been talking about what to keep in our secret drawer, as we've speculated about what my grandparents might have stored there, and the families who owned this treasure before them. Perhaps they kept gold and private papers, jewelry or hard-to-come-by commodities, like teas and chocolates; maybe some gin and whiskey during the prohibition; perhaps a weapon or two. Maybe love letters from a forbidden suitor; a locket of hair and some photographs; some racy lingerie. You can't very well stash something ordinary in an extraordinary drawer. The pressure is on to choose well.

Still, in the end, as we come to understand, you can't take it with you. *Melissa is a writer, photographer, artist and lawyer. Read more on her blog at www.HeartLaw.blogspot.com.*

Congress Ignores The West's Firefighting Needs

By Jodi Peterson

Congress still hasn't figured out how to pay for wildfires. Choked by partisan bickering and entrenched refusals to compromise, the 113th Congress has passed the fewest pieces of legislation of any Congress in the past two decades — just 108 significant laws, compared to nearly 170 per session from 1995 to 2010.

One of the most notable bills languishing without action would fix the long-standing, serious problem of how we pay for fighting wildfires without plundering the federal programs meant to keep the woods from burning. "It's a catch-22," says Jim Ogsbury, executive director of the Western Governors' Association. "Firefighting shouldn't come at the expense of fire prevention." Each year across the nation, wildfires burn an average of 7 million acres, and while the U.S. Forest Service allocates about 40 percent of its budget to firefighting, in extreme years that funding burns up by July or August, a month or more before fire season ends.

Then the borrowing begins. Staffers call it "fire stealing"— taking money to fight fires from forest stewardship, research and recreation.

Congress is supposed to return that borrowed money, but even when it does, work has already been disrupted, and ironically, funding is often yanked from projects that could help reduce the risk and intensity of wildfires. During 2012 and 2013, roughly $1 billion was pilfered, leaving the agency too broke to thin trees near homes in Arizona's Verde watershed, for example, or reduce fire hazards in California's Tahoe National Forest.

Federal and state officials and policymakers agree that the current budgeting model, also used by the Department of Interior, is broken. Firefighting costs keep climbing. Wildfire season is two months longer than it used to be, and since the 1970s, the average acreage burned has increased five-fold. Meanwhile, development keeps encroaching on forests, forcing firefighters to defend homes, an expensive - and dangerous - task.

The most promising remedy so far has been stalled out in the House since last December. Called the Wildfire Disaster Funding Act, it would treat the biggest wildfires like any other natural disaster, allowing land-management agencies to tap a $2.7 billion federal disaster relief account, like FEMA does after hurricanes and earthquakes. That would let agencies fully fund existing programs, including those that reduce fire danger. This is the same approach proposed in President Obama's 2015 budget.

The Wildfire Disaster Funding Act has bipartisan support across Congress. Sponsored by Sens. Ron Wyden, D-Ore., and Mike Crapo, R-Idaho, and by Reps. Mike Simpson, R-Idaho, and Kurt Schrader, D-Ore., it's garnered 62 Republican cosponsors and 87 Democratic cosponsors. More than 200 organizations have endorsed it, ranging from the American Farm Bureau Federation to the American Loggers Council and The Nature Conservancy — even the National Rifle Association. Five Western governors sent letters supporting the bill, and Interior Secretary Sally Jewell has urged its passage.

Yet, the Wildfire Disaster Funding Act has gone nowhere, thanks to opposition from two powerful House members: Budget Chair Paul Ryan, R-Wis., and Natural Resources Chair Doc Hastings, R-Wash.

In July, Ryan sent his colleagues a letter stating that the bill would break the federal budget by increasing spending and deficits. Simpson and Schrader have countered that their proposal doesn't change total spending.

Both Ryan and Hastings are pushing instead for Senate action on Hastings' Restoring Healthy Forests for Healthy Communities Act, which the House passed last fall. It doesn't solve the fire-borrowing problem, but supporters say it would reduce fire danger, and hence suppression costs, by expediting grazing and logging projects that remove fuel from forests. However, the bill would also reduce environmental review and limit public comment, and President Obama has said he would veto it.

The administration proposed an emergency infusion of $615 million to prop up Forest Service budgets this fall, since any legislative fix wouldn't take effect until next year. But that request, bundled with a controversial immigration measure, failed to pass either chamber.

So Congress went into the August recess without action, and as major wildfires continue to burn in Washington, Oregon and California, the Forest Service is faced with "borrowing" yet again. On Aug. 15, the Western Governors' Association sent an urgent letter to House and Senate leaders asking them to "resolve this burgeoning problem for the West without further delay." Now that Congress is back in session, perhaps representatives will finally act.

"There's always the possibility that common sense will break through the ideological arguments," says Gov. Jay Inslee of Washington state, where summer wildfires have burned roughly 400,000 acres and 370 homes, and killed one person. "Especially if people in the House could stand next to a charred family home."

Jodi Peterson is a contributor to Writers on the Range, a column service of High Country News (hcn.org), in Paonia, Colorado, where she is the magazine's managing editor.

The Roads Scholar

By Ben Goldfarb

Marcel Huijser Age: 46 Vocation: Road ecologist Hobby: Extreme wildlife photography. Recently spent 13 days camping in sub-zero temperatures in Norway to photograph musk oxen. (Check out www.marcelhuijser-photography.com for the results.) "The hardest part was the wind," he says. "It's loud, it's tiring, and anything you don't have in your hands blows away." Tech innovation: Mounting a camera on a remote-operated toy car to photograph bison; now beta testing on Missoula deer.

In the orange Montana twilight, Marcel Huijser paces a bridge spanning U.S. Route 93, trying to think like a bear. This graceful arc, surfaced not with pavement but with soil and shin-high grasses, is a triumph of conservation engineering: Built by the Montana Department of Transportation in collaboration with the Confederated Salish and Kootenai Tribes, the bridge is one of 41 crossing structures in a 56-mile stretch of highway that help animals from moose to mountain lions safely traverse the road. Yet Huijser, an ecologist who studies wildlife crossings, can't help but imagine ways to improve it. The grass, for example, fails to block the headlights of the Missoula-bound traffic 26 feet below. Huijser's remote cameras once captured a black bear fleeing from an approaching car's glare. "A visual screen would be helpful," he says, thoughtfully stroking the grizzled beard that covers his lean face. "It could just be a wooden fence."

To most people, roads connote progress. But Huijser sees asphalt as a challenge to surmount. One minute he's pointing out brush piles that allow rodents to navigate the overpass, and the next he's describing his vision for modular bridges that can be relocated to accommodate new migration routes as climate change pushes species northward.

Huijser's passion derives from his native Netherlands, where infrastructure is both a threat to wildlife and a tool for conservation. In the Netherlands – a country that has just one-ninth the landmass of Montana, and almost 17 times as many people – preserving wildlife has become an urgent, and necessarily urban, task. The nation boasts over 600 wildlife crossings, including the world's largest, the half-mile long Natuurbrug Zanderij Crailoo, which spans a railway, a sports complex and a business park.

Road ecology was an obvious choice when Huijser sought a wildlife research focus in the '90s in the Netherlands. In a place where bears and wolves have been extinct for centuries, that meant sweating the small stuff:

specifically Erinaceus europaeus, the European hedgehog, dying by the hundreds of thousands on Dutch roads. Huijser's research revealed that planners could prevent hog-kill by building crossings at hedgehogs' favorite territory: the margins between forests and grasslands. "One of my statements during my Ph.D. defense was that they're really edgehogs," he says, sheepish at the pun.

In 1998, at a Florida conference on – what else? – road ecology, Huijser met Bethanie Walder, now his wife and, until recently, public lands director for a New Mexico-based conservation group, WildEarth Guardians. In 2002, he relocated to Missoula for a job with Montana State University's Western Transportation Institute (WTI) and discovered that U.S. agencies had different priorities than European ones – primarily reducing collisions with the large, common animals that frequently damage cars and injure people.

That's important, of course: Huijser has shown that wildlife crossings often pay for themselves by reducing crash expenses. But the focus on collisions often neglects the needs of small or rare species. Because deer use underpasses while grizzlies prefer overpasses, for instance, an ungulate-centric approach doesn't help threatened bears. "If you took a conservation perspective," Huijser explains, "you'd design structures of different type, dimensions and location."

The U.S. 93 project takes such a perspective – thanks largely to the tribes, whose legal muscle and concern for wildlife led to crossings being incorporated in state plans to widen the highway through the Flathead Indian Reservation. Huijser's camera-traps and track beds – groomed swaths of dirt that reveal hoof- and paw-prints – suggest the efforts are working. At least 20 different species have used the crossings, including bobcats, badgers and grizzlies. What's more, the structures have reduced crashes by at least 50 percent, suggesting that conservation and safety are compatible goals.

"That research is being used to justify projects across the West, around the country, and internationally," says Rob Ament, WTI's road ecology program manager. Huijser has consulted on Chinese and Mongolian highways, and last year published a study suggesting that Brazil (where he'll teach this fall) could profit from crossings for capybaras, enormous rodents that roam in herds and cause traffic fatalities.

Yet while he calls his cost-benefit studies his most important work, finance isn't his primary motivation. "We have to consider what it's worth to have animals on the landscape," Huijser says. "That hasn't been part of our economic analyses. But our well-being depends on having wildlife around us." *This story was funded by the Solutions Journalism Network.*

Yes, Wildlife Contraception Works

By Allen Rutberg

When my 12-year-old son encounters any phenomenon that doesn't yet fit into his worldview, he'll sometimes ask, "Dad, is that a 'thing," meaning, is it something worth caring about?

This isn't just my son's problem, of course; at times we all face bewildering novelty. And if it's a thing like a new technology that makes us confront our deeply rooted feelings about nature, we might find ourselves turning away from it.

I wonder if that's why the idea of wildlife contraception has not — except as a curiosity — entered the public conversation. Wildlife contraception isn't new. Wildlife biologists were injecting deer with steroids to control fertility in the 1960s, but the steroids passed easily into the food chain and caused all sorts of side effects in wildlife. Now we use immunocontraceptives, protein-based vaccines that are reversible and cannot enter the food chain. They cause no harmful side effects in treated animals.

Several immunocontraceptive vaccines have been tested and proven effective in the field. Among the best-tested is PZP, which is produced by my colleagues at the Science and Conservation Center in Billings, Montana. Antibodies produced in response to PZP prevent pregnancy by blocking sperm from attaching to eggs. It is delivered to mares, does or other female animals by hand-injection or by darting, and a single treatment lasts one to three years. Boosters last even longer.

But here's the puzzle: Why aren't these vaccines used more? Fertility control entered the domain of wildlife management 20 years ago, when the National Park Service began employing PZP as its principal tool for managing the historic population of wild horses at Assateague Island National Seashore in Maryland.

The Park Service has managed horses at Assateague with PZP ever since. Horse population targets have been met, revised downward, and met again. For 20 years!

If Assateague stood alone, it could be ignored. But it has lots of company. The use of PZP for population control has spread down the East Coast to three other wild horse herds. It works in the West, helping to manage wild horses in seven Bureau of Land Management or Forest Service herd-management areas, seven wild horse sanctuaries, and five Native American reservations.

Nor is fertility control limited to wild horses. Populations of suburban white-tailed deer on the East Coast have been stabilized or substantially reduced in three communities with the help of PZP. Reproduction in the bison herd on Santa Catalina Island, California, was

stopped cold — in two years — with PZP, ending the expensive process of controlling populations by shipping bison off the island.

Yet that is a small drop in the giant bucket of human-wildlife conflicts. The BLM, for example, treats an average of 500 mares a year in a free-roaming population that is now approaching 50,000. The BLM's excuse boils down to, "It's too hard." (By comparison, should we consider it "easy" to spend $45,000 apiece to provide lifetime care for the 50,000 captive "excess" horses that the BLM now holds?)

So why hasn't wildlife contraception become a "thing?" For some people, it has. Those in the animal shelter and rescue community, for example, eagerly embrace wildlife contraception as but a short hop from the spaying and neutering of cats and dogs. Wildlife contraception is also a thing for those paid to control so-called nuisance wildlife, mostly in response to consumer demand for non-lethal solutions.

For many people, though, especially those in the conservation community, "wildlife contraception" links two terms that bear non-overlapping sets of associations. Depending on your philosophy, wildlife runs free, protected and separate from the human community; or it is a natural resource to be conserved and sustainably used for human benefit. In contrast, contraception evokes technology, urbanism and modernism, distinct from and often destructive of wildlife and nature.

But wildlife contraception is a practical solution to the problems that often arise where people and wildlife intersect at messy physical and category boundaries.

Among the creatures that cross boundaries are bison, which regularly breach government-drawn lines while bearing a split cultural identity as both wildlife and livestock; wild horses which, depending on your perspective, may be wildlife, or livestock, or nuisances, or pets; and deer, whose cultural identity becomes clouded when they leave the hills of Colorado's Front Range or western Pennsylvania and proliferate in Philadelphia parks, on the outskirts of Chicago, or in the city limits of Boulder or Helena.

Those messy boundaries are spreading. So here's my advice: Open a mental file, label it "wildlife contraception," and start learning about it. You'll soon discover just why it's a very good idea.

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