



CROWN
of the
CONTINENT
and the
GREATER
YELLOWSTONE

MAGAZINE

UNIVERSITY OF
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Fall 2016

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Jerry Fetz, Initiative Co-Director, Professor and Dean Emeritus, College of Humanities and Sciences

Rick Graetz, Initiative Co-Director, Geography Department Professor

Susie Graetz, Managing Editor

Neal Wiegert, Designer, UM Printing and Graphics

Will Klaczynski, Director of Photography

Crown of the Continent and Greater Yellowstone Initiative
c/o Department of Geography
University of Montana
32 Campus Drive
Missoula, MT 59812

Email: crown.yellowstone@umontana.edu

Web site: crown-yellowstone.umt.edu

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Glacier In Winter field course



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Seeley Lake lecture



Our mission
is to inform the
public about what
is happening in
the Crown of
the Continent
and Greater
Yellowstone
ecosystems.



Fall Field Course, Bowman Lake, GNP.



Mountain
Ecosystems
Field Study -
Glacier

Photos by
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Big Sky, MT
community
lecture



We do this through our
publications, with presentations
in communities, and by holding
classes on campus and off.



Cherry trees, Flathead Lake. Rick and Susie Graetz

MARIAS PASS... SO NEAR, YET SO FAR...

by John Fraley



An unlikely three-member corps set out from Assiniboine on the east slope prairie on a quest to find the pass and confirm its suitability for Jim Hill's Great Northern Railroad. This unlikely trio included an engineer, a soldier, and a Flathead tribal member. Their success was one of the great feats of exploration in the American West.

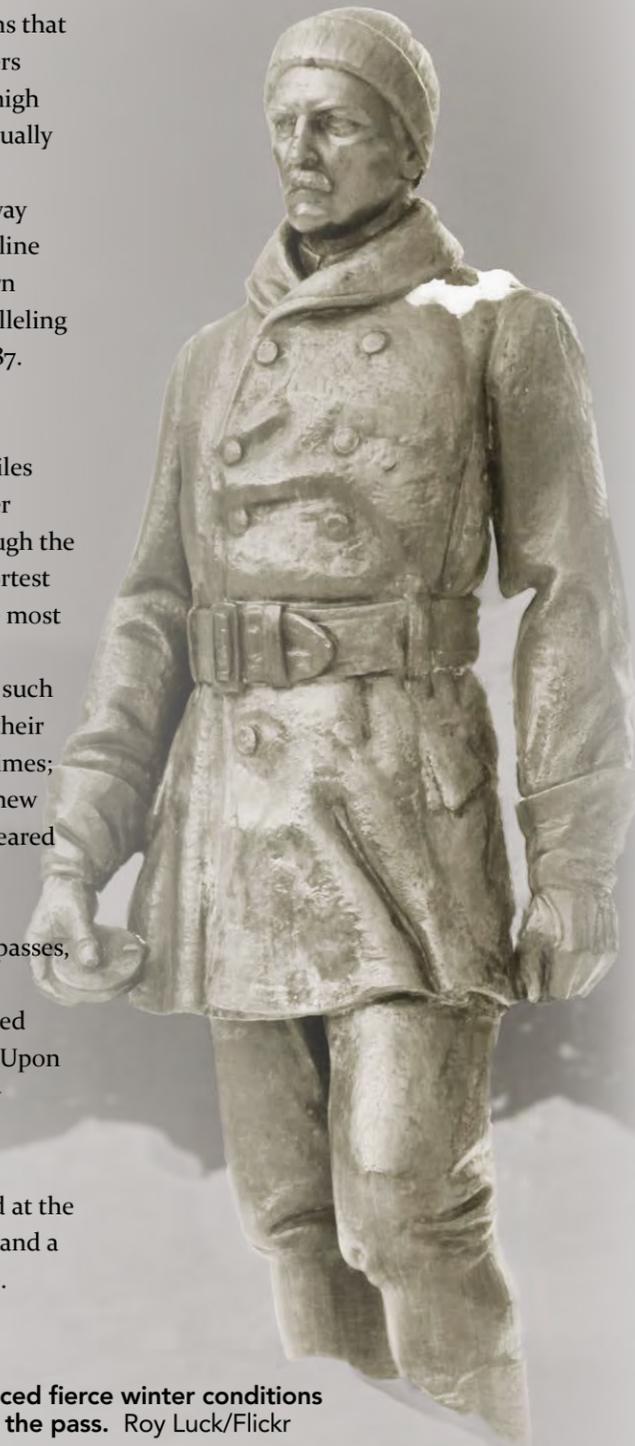
The Middle Fork Drainage was a complete wilderness in 1889. A few rough trails followed the main river course, but there were no paths that could even be considered wagon roads. A handful of lonely trappers and prospectors explored the drainage, but that was it. The high peaks and rugged, timbered slopes and valleys lay virtually untouched by humans.

In the mid-1880s, the Great Northern Railway Company's founder, James Hill, pushed his line west from Minneapolis across the northern region of the western United States paralleling the Canadian boundary to Havre by 1887. From there, a spur line was completed southwest to Great Falls, Helena, and Butte. A small siding extended four miles west of Havre by 1889. But to go farther westward, Hill needed a low pass through the mountains, one that would give the shortest possible route, the easiest grade, and the most maneuverable curves on to the Pacific.

Blackfeet and Flathead Indians had used such a low pass for hundreds of years, according to their elders. Also, trappers had crossed the pass many times; they just had not documented their trips. Some who knew of its existence avoided crossing to the east side because they feared Blackfeet war parties.

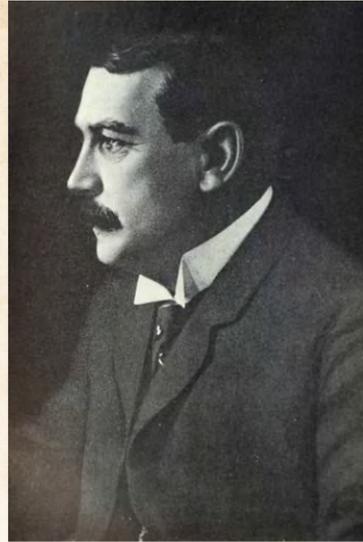
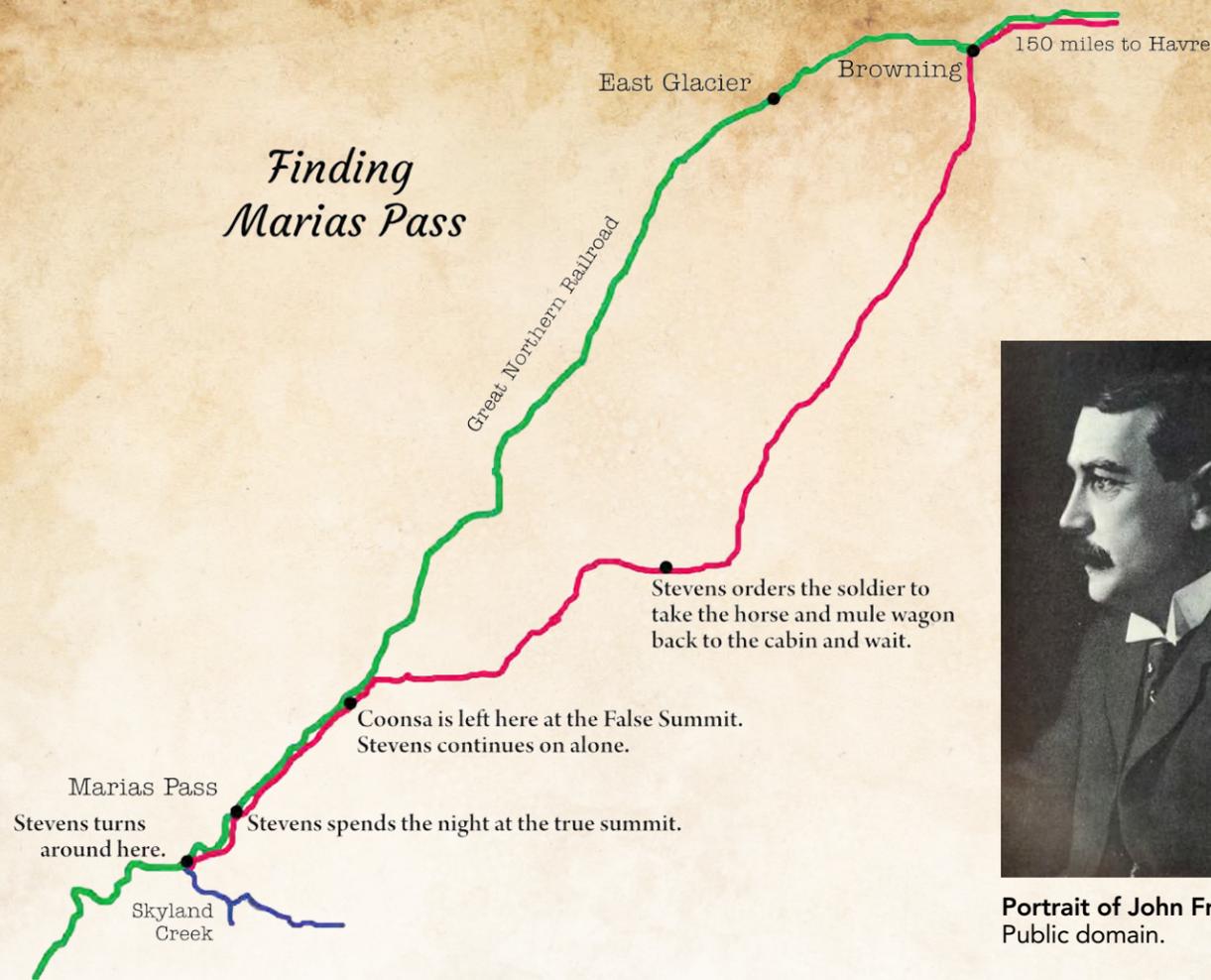
An official expedition, launched by Governor Isaac Stevens of Washington Territory in 1853, found a number of divide-crossing passes, but failed to identify the true pass. James Doty, in 1854, ascending the South Fork of the Two Medicine River toward the divide stopped short; he climbed a mountain, and claimed to have seen the pass. Upon returning to his duty station at Fort Benton, he drew a remarkably accurate map showing the pass location, but it remained officially unexplored.

Several people told Hill that the sought-for pass could be found at the headwaters of two drainages: Two Medicine River on the east side and a large tributary of the Middle Fork of the Flathead on the west side.



John Stevens faced fierce winter conditions in his search for the pass. Roy Luck/Flickr

Finding Marias Pass



Portrait of John Frank Stevens. Public domain.

After considering all of the reports, Hill had no doubt about its existence. In 1888, he sent a Canadian engineer by the name of Barclay to confirm its presence. Like others before him, though, Barclay's effort was disappointing. As the railroad contract had already been signed with construction companies to extend the line west to Spokane, Hill decided he needed a new engineer.

Chief Engineer E. H. Beckler hired John F. Stevens, an engineer with a sterling reputation of accomplishment on the Canadian Pacific Railway. Beckler explained that the proposed northern route would pass through the Flathead Valley and then along the Kootenai River and across northern Idaho. For this route to be established, a pass across the mountains must be discovered in the north, as directly west of Havre as possible.

Stevens, a self-educated, decisive and confident man, immediately agreed to the proposition. The task would not be easy. Adding to the difficulty, Stevens set out to look for the pass in the cold of December 1889, so that construction could begin that spring.

At Fort Assinniboine, a few miles west of Havre on the prairie, Stevens secured a covered wagon, mule team, supplies and a saddle horse. A soldier was sent along to drive the team and return it to the fort after they reached the foot of the mountains.

The two-man corps set out for Blackfoot Agency (now called Browning) in a "light blizzard." Days and about 150 miles later they arrived after enduring nearly constant blowing snow.

Stevens asked everyone he could find about the fabled pass. The white men didn't believe it existed. The Blackfeet feared it. They felt it held an evil spirit, and that anyone who crossed it would surely die.

Eventually, Stevens found a Flathead Indian named Coonsa (or Coonsah), who was hiding out with the Blackfeet, to accompany him by offering him a good sum of money. Stevens later said that he hired the man to go with him in case he needed to send back a messenger, but in no way did he serve as a guide.

Even though Stevens had not been told precisely how

to reach the pass, he had a sixth sense that it existed. To cope with the deeper snow he knew they would encounter, he bought old pairs of snowshoes from a Blackfeet tribal member.

Stevens' little party followed the drainage of the Two Medicine River and stayed in abandoned "Indian cabins" for several nights along the way. The snow deepened as they entered the mountains, and the wagon bogged down. Stevens sent the soldier and mule team back to the last cabin to wait there for his return.

Stevens and Coonsa loaded food and blankets on their backs and continued up the South Fork of the Two Medicine River. Finally, they found a branch that Stevens called a "fair prospect," and after a few miles reached an apparent summit. But almost immediately a "sixth sense" as he described it, told him that this wasn't the true summit.

At this point, Coonsa signaled that he was quitting. Stevens found some dry wood and built a fire, telling Coonsa to keep it going all night if necessary.

Instructing Coonsa to wait for him, Stevens struck out alone, heading south and west, along the wide gap

in the mountains. The afternoon was waning. Driven by an internal fire, Stevens pushed his snowshoes through the powder, gambling that the true pass would not be too distant. He followed the small, gentle drainage of what is now called Summit Creek. A few limber pines and alpine fir, along with taller willow, were all that protruded from the deep snow.

Luckily, after mushing only about three miles and gaining only about 150 feet in elevation, the charmed engineer found himself standing in the legendary Marias Pass over the Continental Divide. To Stevens, it must have looked as if these spectacular mountains had simply parted, just for him. To his north and west, the rocky peaks of Summit, Little Dog, and Elk mountains towered over 3,000 feet. As he stood there, Stevens probably found it hard to believe that other explorers had been foiled for so long.

Stevens made a number of aneroid readings to confirm his discovery. He was now certain that he stood in the lowest pass across the Divide in the United States north of New Mexico. Later surveys showed it to be only 5,216 feet above sea level, thousands of feet below the



Amtrak's Empire Builder passenger train crosses the Midvale Trestle between East Glacier and Browning. Rick and Susie Graetz



Montana Hwy 2 and Little Dog and Summit peaks at Marias Pass.
-ted/Flickr

surrounding peaks. It was the evening of December 11, 1889, a date that Stevens would later remember as the occasion of his greatest engineering accomplishment.

But Stevens, being an engineer, liked to be absolutely sure of things. He firmly believed he stood in the true pass, but noted “it would be an inexcusable blunder if I was deceived.” So he walked on through the pass for about a half-mile, and then downstream along the first headwater stream that feeds Bear Creek, a tributary of the Middle Fork of the Flathead.

Almost immediately, Bear Creek dropped into a timbered canyon and the going got rougher for snowshoeing. After mushing about three miles down the drainage to near the mouth of Skyland Creek, Stevens turned back towards the pass. He was now completely certain that “the waters of the stream under the snow beneath my feet” flowed into the Pacific Ocean. He had crossed Marias Pass and he knew that it would make him famous.

Stevens had seen enough to conclude that rails could easily be laid to the pass and down the west side.

Turning back, the engineer started snowshoeing up along the western tributary, finding it considerably steeper than he remembered. Now, as he climbed back up the steep drainage, his energy began to fail. After a “seemingly hopeless struggle,” he reached the pass again, exhausted; he could see nothing in the pitch black and he knew that the situation could be life-threatening.

A heavy blizzard settled in preventing Stevens from starting a fire. To keep from freezing to death, he walked back and forth in his snowshoes, packing a trail in the snow that would support his weight. He then removed his snowshoes and walked in the trail, back and forth, throughout the night, estimating that the temperature plummeted to 40 degrees below zero. Stevens knew that he would surely freeze to death if he fell asleep.

Next morning, at “the first streak of light,” happy to be alive and able to see the surroundings, Stevens put on his snowshoes and mushed back across the pass. When he reached Coonsa at what is now known as “False Summit,” he found him nearly frozen because he had allowed the fire to die during the night. Stevens “beat some life back into him,” and helped him warm up and get on his feet. The two men retraced their steps to the cabin where the wagon, mule team, and soldier awaited them. They rode back to Indian Agency, looking forward to a well-deserved warm bed and a good meal.

Stevens made his way south to Helena and proudly reported his findings to Beckler. The chief engineer reported the discovery to Jim Hill, who recognized immediately that Stevens had made him another fortune. Survey parties quickly began their work and the construction crews pushed the line west as the weather allowed. Stevens had saved the railroad 100 miles in distance, and found a more direct route across the mountains.

Hill retained Stevens and rewarded him well over the years for his spectacular discovery. A year later, Stevens discovered “Stevens Pass” farther west across the Cascades. Hill promoted Stevens to chief engineer, then in 1902, general manager of the Great Northern Railroad. In 1905, because of Hill’s recommendation (Hill had told Taft and Roosevelt that Stevens was the finest civil engineer in the country), Stevens met

Stevens’ accomplishment set in motion the development of one of the last unsettled areas in the United States. The wild, untouched Middle Fork Drainage was about to be changed forever.

personally with President Theodore Roosevelt, who appointed him as chief engineer on the Panama Canal Project. Stevens never failed in an assignment and this was no exception. It was Stevens’ perseverance and daring in discovering Marias Pass that most impressed Hill and led Stevens to these great accomplishments.

At the last stop of the Great Northern Railway Upper Missouri River Historical Expedition, on July 21, 1925, a ceremony was held on Marias Pass to honor Stevens. A 20-foot high bronze statue was unveiled showing him bundled in the winter garb he wore on that fateful day in 1889.

Stevens, who was sensitive about some people perhaps challenging his rightful designation as the discoverer of the pass, noted that he never claimed to be the first through the pass, but was the first to locate and describe it officially.

The U.S. Geographic Board in a 1933 ruling, confirmed that Stevens was indeed the first to explore the low pass, describe it, and make his discovery publicly known (his report to Beckler).

Because of the official criteria, Stevens was credited with the first official “discovery” and recognition of the

pass, even if it was acknowledged that members of the area tribes had traveled it for centuries. And there is no doubt that a handful of trappers and prospectors had used the area of the pass from time to time. Some people point out that Stevens should not be credited with the “discovery” of Marias Pass, and that is arguable. But no one debates that, as a professional engineer, he was the first to measure its elevation, and confirm its suitability for construction of the railroad.

Stevens’ accomplishment set in motion the development of one of the last unsettled areas in the United States. The wild, untouched Middle Fork Drainage was about to be changed forever.

John Fraley received fish and wildlife management degrees from both Montana universities. He has worked for Montana’s wildlife management agency for 30 years, and is an adjunct faculty member at Flathead Valley Community College, where he teaches wildlife conservation.

*This article is excerpted from Fraley’s book *Wild River Pioneers* (Big Mountain Publishing)

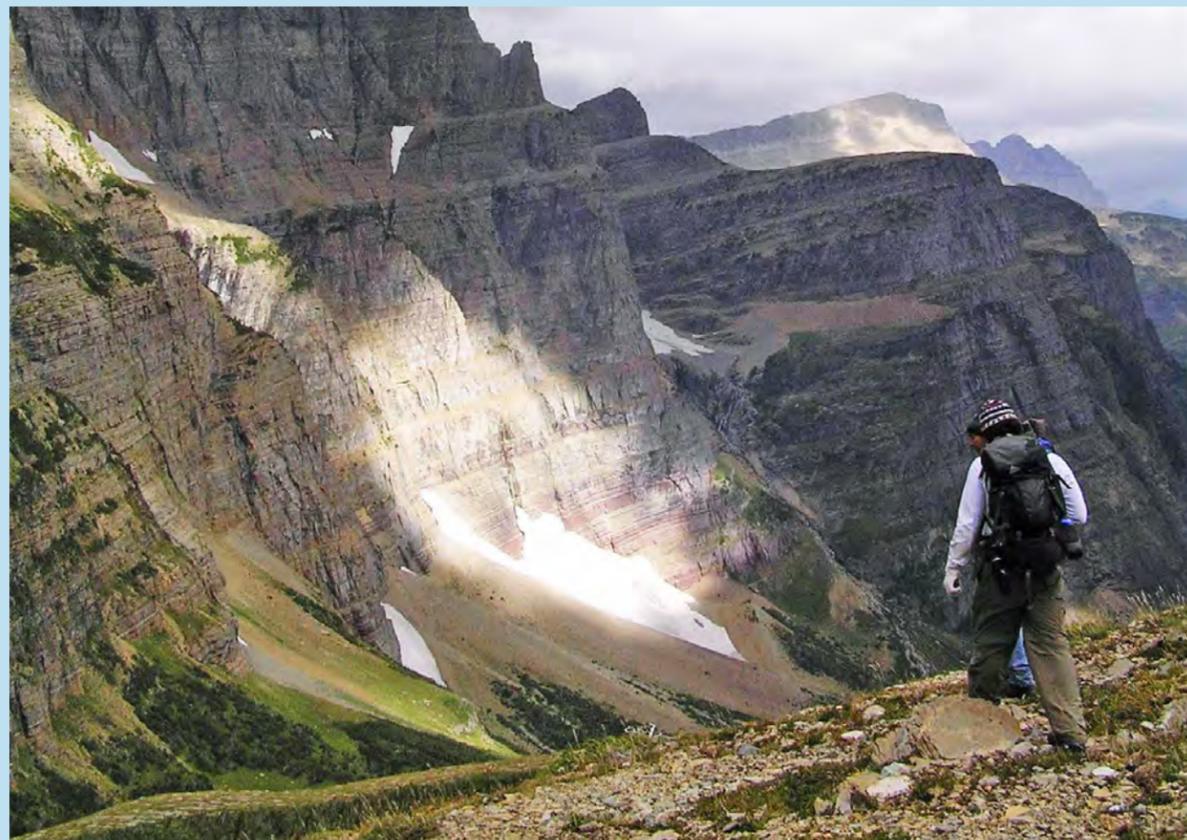
Burlington Northern/Santa Fe workhorses attain the pass. Rick and Susie Graetz



DEEP FREEZE

Ice Patch Archaeology in Glacier National Park

by Craig M. Lee, Robert L. Kelly, Rachel Reckin, Ira L. Matt, and Pei-Lin Yu



Don Sam (Confederated Salish and Kootenai/CSK) on his way to map an ice patch. Rachel Reckin

Patches or fields of permanent ice develop when seasonal snowfalls accumulate to levels that do not completely melt in the summer. Over time, the old snow is compacted by new and layers of ice are formed.

As summer heats up, ice and snow patches begin to melt in the high country of the Crown of the Continent. Crystal clear water trickles from the base of the patches down steep slopes, fostering summer growth of alpine and sub-alpine plants. Grazing animals make their way up to these cool, well-watered inclines, and predators follow the grazers. This is the ancient rhythm of the mountains of the Crown: snow accumulation in the winters, melt-off in the summers. Global warming effects in the Crown and across the world are tilting the balance toward the melt; once-perennial ice patches at high latitudes and high elevations are shrinking at rates not seen in modern times. Unlike glaciers, the stable ice in the patches exhibits little internal deformation or movement and can preserve otherwise perishable

materials for millennia. Because ice patches attract animals and their human predators, some maintain ancient records of human hunting and other activities.

In North America, “ice patch archaeology” is the study of human-made or altered materials recovered from retreating snow and ice patches. As early as the 1920s, archaeological discoveries on glaciers sparked public imagination. Under the storylines “Ice Gives up Indian Arrow” and “Remarkably Fine Specimen of Ancient Weapon Found in North is Centuries Old,” the March 15, 1925, issue of the Vancouver Province newspaper describes the discovery of a complete arrow with fletching, sinew lashing, and a chipped stone projectile point on a glacier. Some 50 years later, complete arrows with fletching, sinew lashing, and projectile points were found in central Norway. From these humble beginnings, the growth of ice patch archaeology today reflects public recognition of climate change impacts, including support for research and protection of items found in ice patches

on public lands. The National Park Service and US Forest Service in particular are funders of this research. The stakes are high: once exposed to the elements, fragile organic objects are subject to rapid decay and loss, and on busy public lands there is also the risk of illegal collecting.

Archaeological investigations to date include Rocky Mountain National Park, within the Greater Yellowstone Ecosystem of Montana and Wyoming, in Olympic National Park in Oregon, and in Glacier National Park (GNP), Montana, where the authors of this paper completed fieldwork in 2013. Perhaps nowhere else in the United States is the evidence for global warming more visible than in GNP. At its inception in 1910, the Park included over 150 glaciers. It now contains only 26—a 67% reduction. In addition to the glaciers, ice patches are also melting at a rapid pace.

While ongoing studies have been measuring changes in GNP's glaciers for over a decade, the effect of this drastic environmental change on cultural heritage resources was relatively unknown prior to our study. Yet the field of ice patch archaeology could be a silver lining to climate change. Although we know that ice patch melting occurred at times in the past, the volume and age of newly discovered materials suggest that the current melt is unprecedented over the past 7,000 to 10,000 years. Most artifacts found by archaeologists are durable and non-organic (e.g., stone), thus the organic artifacts recovered at melting ice patches can complement and fill in important details of the archaeological record. Analytical tools for organic artifacts include the direct

assessment of their age via radiocarbon (AMS ^{14}C) assays for tiny samples due to their excellent preservation and rich carbon content.

Ice Patch Finds

Globally, ice patches reveal two major ancient activities: hunting and travel. Ice patches can be excellent places to hunt in the summer, as large game often use them as a source of water and forage, and as respite from biting insects such as mosquitoes and nose botflies because insects avoid the chilled air above the ice patches. Some animals seem simply to enjoy sliding around in the summer snow. In any case, they form large brown targets against a white background, perfect for hunters. In other places, such as the mountain passes of the Alps, the artifacts left behind are more of a hodgepodge, things that one might lose while traveling through a cold, windy, possibly stormy landscape. Surprisingly, people seem to have lost their shoes — a common ice patch find — with some frequency. One might think that shoes are the last thing a person would want to lose in a snow-covered pass at 11,000 feet, but people who routinely traverse such passes find that leather-soled footwear is slippery on the slopes. Therefore, a person might remove them in order to cut trail (as portrayed in the 1925 silent film, *Grass*, about Bakhtiari herders in Iran).

Archaeological remains recovered from melting alpine ice in western North America include ancient wooden dart shafts and fragments, fletched wooden arrows, bows, antler foreshafts, baskets, numerous wooden



Humerus and skull of young bull bison that climbed the mountain nearly 1,000 years ago. Bob Kelly

artifacts of uncertain function, butchered animal remains, and chipped stone artifacts. Fragments of weapons between 10,400 B.P. (Before Present) and 200 B.P. suggest an ancient tradition of hunting and travel in the high country. Along with oral histories, it is clear that alpine landscapes were and remain important cultural landscapes for Native Americans. Paleobiological (natural) specimens recovered in North American ice patches range in age from several hundred years to nearly 8000 B.P. In the Crown, bighorn sheep (*Ovis canadensis*) are the presumed ice patch prey species. The remains of bison (*Bison bison*) and other large ungulates like elk (*Cervus elaphus*) and mountain goat (*Oreamnos americanus*) are also associated with mid-latitude ice patches. The GNP ice patch project recovered cranial and post-cranial elements from a male bison at an ice patch in 2012.

Doing Ice Patch Archaeology: the Fieldwork

The remainder of this essay reviews some of the issues associated with conducting ice patch research in western North America, with an emphasis on our work in GNP, including (1) methods of ice patch identification; (2) expense of the surveys in terms of time, effort and money relative to the rate of return; (3) the wildcard role of interannual variability introduced by weather events; and (4) the inherent beauty of these seasonally restricted alpine landscapes and their connection to living indigenous communities.

During the GNP project, Google Earth helped to target the ice patches with highest probability of preserved remains, and the time slider feature allowed us to determine which patches survived highest melt years (like 2003 and 2009). Aerial photographs are also useful in selecting likely candidates. Using Google Earth, we were also able to determine whether an ice patch has a flat forefield (the area immediately downslope) where artifacts and paleobiological material (feces, unmodified wood, bone) might linger before decaying or being swept away downslope. As with other ice patch projects, the team always surveyed the streams emanating from a given ice patch for several hundred meters— or until the stream went over a cliff!

During survey, we used Global Positioning Systems (GPS) to map ice patch lateral and lower margins. This allows us to compare ice patch extent based on remotely sensed images and for direct comparison of melt from year to year. Any artifacts or paleobiological



Left: Ice patch country provides key habitat for many desired prey species for ancient hunters. Craig Lee

Right: Ice core sample shows lagged sediment, wood, and other organic fragments from an ancient warming period. Bob Kelly



specimens were photographed and their GPS coordinates recorded. Fragile specimens were carefully mounted on archivally stable board with cotton gauze or muslin strips. A representative sample of nearby paleobiological specimens was collected for paleoenvironmental context. To date, in Glacier National Park we have found ancient wood as old as 5300 B.P., of species that are no longer found nearby. We speculated that some wood could have been transported by raptors for use in nest building, but the GNP's map of known raptor nesting locations does not support this possibility. A more likely explanation for the wood is a higher treeline during previous climatic warming episodes; the radiocarbon dates for wood specimens tally approximately to melt episodes preserved as lagged sediments in ice core samples.

Expense and return

Since ice patches exist at high elevations and in remote areas, this makes them quite expensive to investigate—even more so in light of their low potential return. To date, we have not found a single human artifact in our GNP surveys (other than a few bits of historical signage and the odd modern hat) associated with ice patches. Perhaps the ice patches in GNP were not conducive for use by ancient humans as hunting locales; at least no obvious evidence of their use in this way has been preserved. The GNP Ice Patch Project went to great effort to identify this seeming absence of evidence. Some of our target ice patches were so deep in the backcountry that accessing them required days of strenuous hiking. In Alaska, the Yukon, and Northwest Territories, helicopters are the accepted avenue to access ice patch locations, but as GNP is managed as wilderness, use of helicopters was not an option.

Yet the value of ice patch finds is irreplaceable. In the last 30 years, many spectacular finds have been discovered by accident across the globe— notably, Ötzi, the Neolithic man who was murdered some 5,000 years ago in the Italian Alps, and the nearly 500-year-old Kwäday Dän Ts'ınchi (southern Tutchone for Long Ago Person Found) in British Columbia. The archaeological information gleaned from such finds, let alone the significance for descendant cultures, is unrivaled. Take the resurgence in popularity of the woven spruce root



Culturally informed standards of procedure are a major accomplishment of the GNP Ice Patch Project. Bob Kelly discusses tactics with Deirdre Shaw (GNP) and Ira Matt (CSK). Pei-Lin Yu

hat style found with Kwäday Dän Ts'ınchi, for example. Intentional surveys of ice patches are producing successes like the remarkable late-Paleoindian age atlatl foreshaft recovered near Yellowstone, but in general fewer than ten percent of ice patches surveyed to date have revealed any artifacts. This could be because many ice patches were simply not used often and the odds do not favor preservation and discovery.

Weather and other perils

Ice patch research is at the mercy of the weather. It is best to wait until as late in the warm season as possible, right before the first snows of the fall. This means that the fieldwork window is tight; during the project the team had to seek cover from several late summer snow squalls. In addition, snowfall variability within the steady curve of warming climate means that ice patches can sometimes accumulate snow. The winter of 2010–11, in fact, saw snowfall that was 250 percent of normal so that in August 2013 the patches were larger than in August 2010! Organic artifacts are susceptible to decay when exposed to sunlight and alternately wet and dry conditions, but also when in contact with “warm snow,” reducing the likelihood of discovery.

The Future of Ice Patch Archaeology

Ice patches are important parts of emotionally moving landscapes and ecosystems. Much of the high country in the Crown is protected today as national parks, designated wilderness areas, national forests, and state lands. The clear and obvious evidence of long and repeated cultural use of alpine environments, including ice patches, vividly illustrates that these locations were integral — albeit likely seasonal — destinations within

the traditional lands of many Native peoples. Many ice patch projects, including those occurring in Alaska, the Yukon, and Northwest Territories have been blessed by the involvement of Native Americans with deep and enduring connections to the high country. Glacier National Park's alpine regions continue to be important spiritual locations to the Salish, Pend d'Oreille, Kootenai, and Blackfeet people.

During our project, the intersection of climate science, archaeology, and culture in the field of ice patch archaeology has created innumerable positive outcomes for project participants, including land managers, scientists, and local communities. The spirit of cooperative and innovative stewardship of ice patch cultural heritage is part of a worldwide trend. For example, Andrews et al's (2012) work in the Northwest Territories with the Shuhtagot'ine (Mountain Dene) has produced heritage exhibits linking the archaeological record with the living culture, (see <http://www.pwnhc.ca/item/nwt-ice-patch-study-virtual-exhibit/>.) The Glacier Ice Patch Project has culminated in a culturally informed, interactive webpage describing the project for Salish, Kootenai, Pend d'Oreille, and Blackfeet audiences, the general public, archaeologists, other scientists, and resource managers, (see <http://glaciericepatch.org/IcePatches/index.html>). A short video describing the project can be found online (<https://www.youtube.com/watch?v=w1Vgs9IMixY>).

In coming decades, the field of ice patch archaeology will certainly expand to other parts of the globe where permanent snow and ice exist, including South America and Asia. The future of this research owes much to pioneering efforts in the Crown of the Continent, and we expect that opportunities to learn from ice patches are just beginning.

We thank... the Culture Committees of the Salish, Pend d'Oreille, and Kootenai tribes and the Blackfeet Nation for their support and participation; the National Park Service, the Rocky Mountains Cooperative Ecosystem Studies Unit, and GNP for their unflagging efforts to support our collective endeavor; and the NPS's Climate Change Response Program and GNP for their financial backing.

Craig M. Lee - research scientist at the Institute of Arctic and Alpine Archaeology/University of Colorado/Boulder and Metcalf Archaeological Consultants, Inc.

Robert L. Kelly - professor of anthropology/University of Wyoming.

Rachel Reckin - doctoral candidate/Cambridge University.

Ira L. Matt - Confederated Salish & Kootenai tribal member and program analyst for the Advisory Council on Historic Preservation.

Pei-Lin Yu - assistant professor of anthropology/Boise State University.



Bob Kelly and Rachel Reckin (University of Wyoming) excavate an Ice Bison skull. Archaeologists were impressed by the excellent preservation of this nearly 1,000-year old specimen, whose DNA appears to be linked with relatives from the nearby grasslands. Craig Lee.



Hey! Glacier National Park...

You've Come A Long Way Baby

by **Vince Devlin** of the *Missoulian*

Grinnell Glacier? Named for naturalist George Bird Grinnell, one of the chief proponents of the 1910 establishment of the park.

Logan Pass? Glacier's first superintendent, William R. Logan.

Sperry Glacier? Dr. L.B. Sperry, who spent 13 summers exploring the future park in the late 1800s and early 1900s.

And Mount Reynolds honors Albert "Death on the Trail" Reynolds, an early ranger whose friendship with the first superintendent of Canada's Waterton Lakes National Park led to the establishment of the world's first international Peace Park.

Deirdre Shaw, Glacier National Park's archivist, can tell you all about men like Grinnell, Logan, Sperry and Reynolds, but she let's us in on a little secret: It may have been a man's world in these parts more

than a century ago, but Glacier's history is also populated by some adventuresome and fascinating females.

Take Mary Roberts Rinehart, an East Coast author, playwright and journalist who fell in love with Glacier Park in the early 1900s. Known for her mysteries, often called "the American Agatha Christie," she definitely left her mark. The phrase "the butler did it" stems from Rinehart's 1930 murder mystery "The Door," where the phrase itself never appears, but where – spoiler alert – the butler did it.

Her 1908 novel "The Circular Staircase" broke ground for a new mystery genre that became known as the "Had I But Known" school of writing. Her 1920 play "The Bat," featuring a costumed super criminal, was cited as one of his inspirations

by the cartoonist who created Batman.

Also a World War I correspondent for *The Saturday Evening Post*, Rinehart wrote more than 70 novels, plays and short-story collections. But three of her non-fiction works most interest Shaw. Spending one of her birthdays on the North Fork of the Flathead River, the mystery writer described it as "riotous, debauched, and highly erratic." "That," Shaw notes, "was her description of the river – not the birthday party."

Quotes from Mary Roberts Rinehart's travels in Glacier:

- "No woman ever really knows a man until she has camped with him."
- "I have paid for my experience with a square yard of blisters, and a mile or so of scratches. I have eaten a ton of flapjacks and more bacon than is ladylike to remember."

"Bootlegging Queen" of the Park, Josephine Doody, ca. 1920.

“I have paid for my experience with a square yard of blisters, and a mile or so of scratches. I have eaten a ton of flapjacks and more bacon than is ladylike to remember.”



Mary Rinehart and companions, 1915. R.E. “Ted” Marble

- *“Had I commenced to rough it with men early in life, I might have been a different sort of camper. But I commenced in full maturity, and after considerable thought. Contrary to the popular belief that I am a muscular and rather hard-bitten woman, who sails into a campsite and puts up the tents with one hand while unsaddling horses and cooking supper with the other, my part of any expedition ends when I accompany it and take care of myself.*

“This rule, carefully impressed on the males of the party, enables me to make hard marches and to be a calm and admiring audience at the end of the day. I know women who have been less foresighted, who have made the initial error of learning how to put up a tent and how to cook over a sheet-iron stove eight inches high. I knew one who made delectable biscuits in a reflector oven, and for months on end her life was just one biscuit after another.

She became entirely bent over from the camp stove and, from the wood smoke, at the end of the season her skin resembled that of a well-cured ham.

“I, too, can make biscuits in a reflector oven, but no member of my outfit has ever suspected it – nor ever shall.”

In her books “Through Glacier Park: Seeing America First with Howard Eaton” (1916), “Tenting Tonight: A Chronicle of Sport and Adventure in Glacier Park and the Cascade Mountains” (1918) and “The Out Trail” (1923), Rinehart offered her theory on: Why the Males of the Human Species Seek the Wilderness.

- *About one in a thousand does so because of an overwhelming love of nature.*

- *One in 10 does to either prove he’s as good as he ever was, or to make himself as good as he once was.*

- *Every other man in the wilderness was there for one of two reasons: to get away from women, or to take them along as an admiring audience.”*

The first women to see what would become Glacier National Park were many, and their travels covered thousands of years. When Indian tribes’ journeys took them through the future park, Shaw notes, Native American women walked—or rode horseback—step-by-step with the men. Running Eagle Falls in the park is named for a legendary Blackfeet warrior woman who bravely fought to save her father from attack by another tribe. Bird Woman Falls is also named for a Native woman, though whether it’s for Sacagawea, who never ventured this far north with Lewis and Clark, or someone else, is subject to debate. George

Bird Grinnell’s wife Elizabeth liked to claim she was the first white woman ever to lay eyes on Glacier, but Shaw says that distinction more likely falls to someone like Elizabeth “Nattie” Collins. Collins, known as “the Montana Cattle Queen,” came from Choteau to prospect for gold in the area starting in the 1880s – and in 1894 or ’95 became the stuff of Glacier folklore.

Collins and one of her mining partners, Frank McPartland, were either drinking or they weren’t, and either arguing or they weren’t, when they shoved off in a rowboat to cross Lake McDonald. Collins made it. McPartland drowned. McPartland had a mountain in Glacier named for him. Collins has Cattle Queen Creek.

Other early female visitors to Glacier included a renowned British

mountain climber, Dorothy Pilley Richards, and best-selling author Cornelia Cannon, who was not a climber, but still scaled a peak in Glacier with her husband on their honeymoon, in 1901. Cornelia reached the summit first and, Shaw says, perhaps jokingly declared it Mount Cannon, but the name stuck. A note the Cannons left at the peak was discovered 84 years later.

Shaw had many stories of Glacier’s earliest female residents. There was Columbia Falls boarding house owner Lydia Comeau, whose husband had staked out a homestead claim on Lake McDonald before the park was founded, and where the family spent summers. Lydia’s youngest daughter described her mother as “only about as big as a pint of milk, but she was tough.” Lydia

remembered the variety of foods the homesteaders enjoyed, which she described as “jerked venison, salt venison, canned venison and smoked venison.”

The Comeaus’ nearest neighbors were the well-to-do John and Olive Lewis, who owned the Snyder Hotel, a forerunner to Lake McDonald Lodge. When Lydia discovered Olive had climbed over and, in the process, broken the Comeaus’ fence to pick cherries, she ordered Olive out. And when Olive headed for the gate, tiny Lydia stopped her in her tracks, ordered her to leave the way she had come, and “to fix the fence before she left.” When Olive protested that she did not have a hammer, Lydia handed her a rock and stood watch until Olive had hammered the fence rail back into place.



Local residents at Snyder Hotel, ca. 1900—Lydia Comeau, 2nd from right.

“Every other man in the wilderness was there for one of two reasons: to get away from women, or to take them along as an admiring audience.”



"I go up for a day or so and that is enough.

It is not like it used to be, and so much dress and style spoil anything for me. I care very little for fuss and feathers."

Women hikers at Lake Josephine. Fred Kiser

In its earliest days, Glacier Park was a bit of a playground for the rich and by 1918 Lydia couldn't take it for much more than a day. "The freedom up there is gone and there are so many changes, but I love the place," she wrote. "I go up for a day or so and that is enough. It is not like it used to be, and so much dress and style spoil anything for me. I care very little for fuss and feathers."

Deirdre Shaw had been in Glacier a good year before learning that a name she kept hearing – "Bud" Henderson – belonged to a woman. The Norway-born Henderson arrived in Belton, now known as West Glacier, in 1914. Her father worked as a stone mason in the new national park; Bud, who eventually worked as a dispatcher and telephone operator for the Great Northern Railway, got her nickname because other railroad employees had trouble pronouncing her given name, Gunhild. Well, one night in 1924, Bud received a call from the Lake McDonald Lodge winter caretaker. Three men had ventured out in the icy waters to fish, but their boat had sunk and only two had returned.

Bud alerted rangers, shut down the Belton Depot, went home, grabbed her skis – and passed the all-male rescue party on snowshoes that had departed earlier. Henderson found the man along the shoreline. She and a nearby homesteader built a fire and worked feverishly to revive him. "I went down there and worked with him, and poured whiskey into him, and massaged him," Henderson said. "And I said, get a fire started. ... I had matches and all that.

When Henderson asked the rescue party for more whiskey to give to the man once it arrived, "They said they drank it on the way," she said. 'You go massage him,' I said, 'I'm all in,' and they wouldn't



Mary Rinehart and Blackfeet tribal members. R.E. "Ted" Marble

Up to the present time, we have not had a ranger – male or female – who is one-tenth as good at this sort of work as Miss Githmann...

touch him, and so he died."

While Shaw has many stories of females in the park, none of the women of Glacier's early days were employed by the National Park Service. The bias against women – and the fact that the world was about to begin to change – are both evident in a 1924 letter from Yellowstone National Park's superintendent, Horace Albright, to his chief ranger. "In general, I agree with you about girl rangers," he wrote. "In fact, I took an attitude against them long before you did." But Albright went on to say he intended to appoint two women to jobs in the park's information office.

"Up to the present time, we have

not had a ranger – male or female – who is one-tenth as good at this sort of work as Miss Githmann," Albright wrote. "If I could get a girl of Miss Githmann's caliber, I would be willing to give her a day a week off and make many other exceptions in her case just to get the results of the hours she puts in in the information office. Unless you can wire me the name of some prospective male ranger, I shall (also) certainly appoint Miss Thome, because I think she possesses the qualifications I am after."

It wasn't until the 1930s that things really changed. Mary Sullivan became the first female to work at a job other than clerk-typist, when

she manned the Polebridge entrance station. Mary Dast became the park's first seasonal female naturalist in 1964, women began to work the trails of Glacier in the early 1970s, and Judy Kunch was named Glacier's first permanent female law enforcement ranger in 1979.

The late emergence of women in authoritative jobs in Glacier is why so many of Shaw's early-day stories involved authors, boarding house owners, telephone operators and last-but-not-least a bootlegger.

People who know Glacier may be most familiar with the tales of the latter, Josephine Doody, an

opium-addicted, moonshine maker who famously supplied locals with homemade whiskey, including Great Northern Railroad employees, who stopped trains on the tracks near her cabin and blew their whistle to indicate how many quarts they wanted to buy.

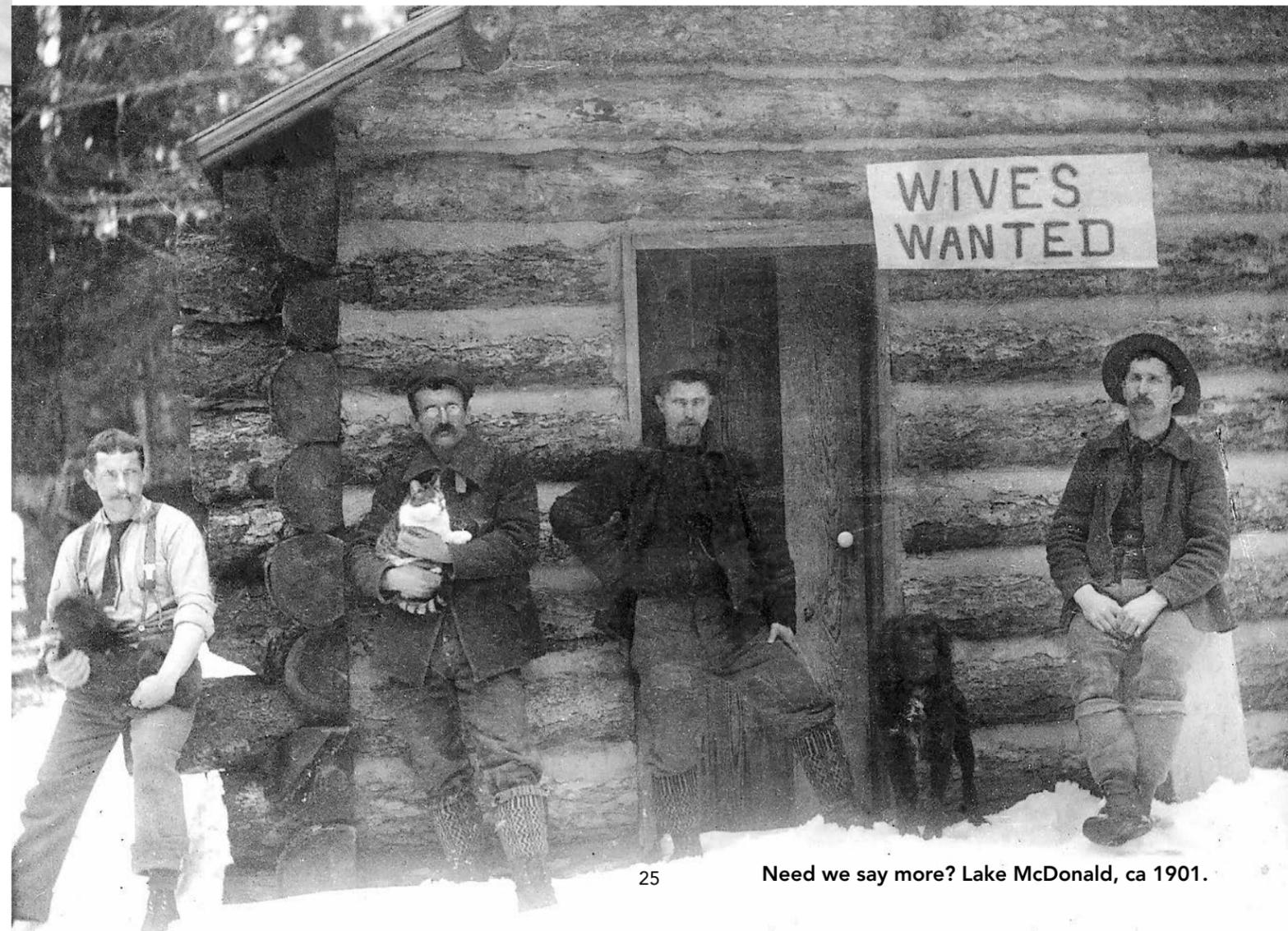
Some park rangers may have been customers too, Shaw noted with a smile, and at least two made the arduous-at-the-time journey to attend her funeral in Kalispell in 1936.

From Doody to Rinehart to Bud Henderson, the women who knew Glacier in its earliest days were

not always, according to Shaw, the demure "admiring audience" Rinehart believed men wanted them to be.

Vince Devlin lives in Polson and covers the northwest portion of Montana for the Missoulian.

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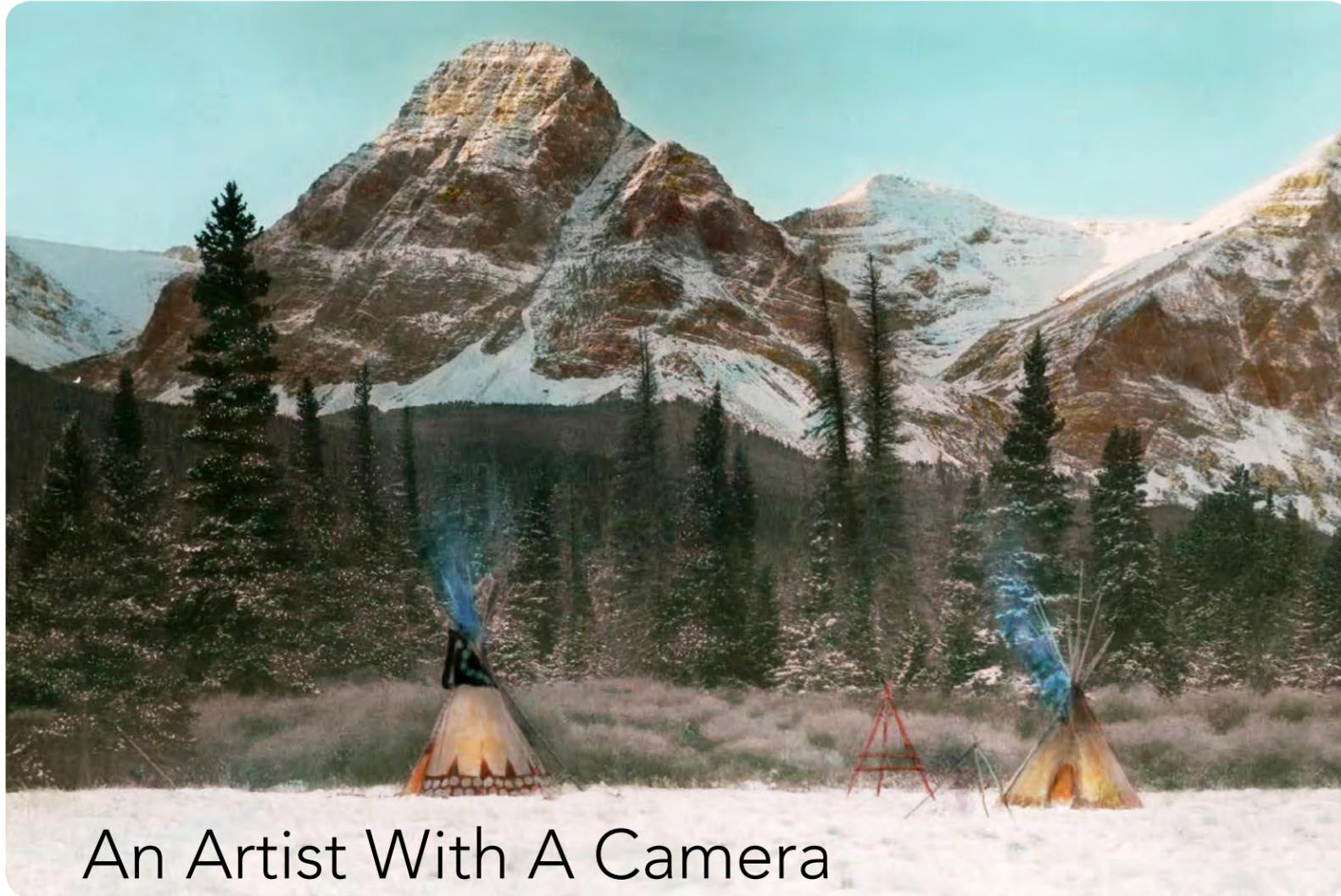
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Wolf Eagle wearing war bonnet. #1036

ART



An Artist With A Camera

In 1896, in search of better health and the lure of adventure in the Wild West, Yale graduate, **Walter McClintock** (1870-1949), was enticed to work as a photographer for a federal commission investigating national forests in Montana. Making friends with the expedition's Blackfeet (Piegan) Indian scout, William Jackson (1860-1899), McClintock was introduced to the Blackfeet community of northwestern Montana. Over the next 20 years, under the patronage of Blackfeet elder Mad Wolf, McClintock made several thousand photographs of the tribe, the open prairie and rugged mountain landscapes they lived in, the ways of their everyday life, and the importance and the beauty of their traditions. Like many of his contemporaries, he believed that Native American communities were undergoing a dramatic transformation that might obliterate their traditional culture. McClintock wrote books, set up photographic exhibitions, and delivered numerous public lectures about the Blackfeet in order to create a record of a way of life that might disappear.

While McClintock's photographs, books and lectures depicted a romantic view of the tribe's life, he gave no indication of the turmoil caused by the US government's broken promises and continual seizure of their land.

Many of his black and white photographs were printed on 3 X 5 inch glass lantern slides, which were then hand-tinted by Charlotte Pinkerton Blazer, Charles Pancoast, or Annette McClintock Karge. A "Magic Lantern" projector allowed the glass slides to be projected with light from a candle onto a wall.





Walks-In-The-Water
and baby Round Face
#919



Wife and daughter
of Little Dog. #62



Elder warriors, once prominent members of the
Brave Dogs Society, Blackfoot tribe. #68



Morning Eagle
(Apina-kui-pitua). #50a

Tipi circle with moon. #501a



William Jackson/
Little Blackfeet. #3



Ceremonial drum circle. #585



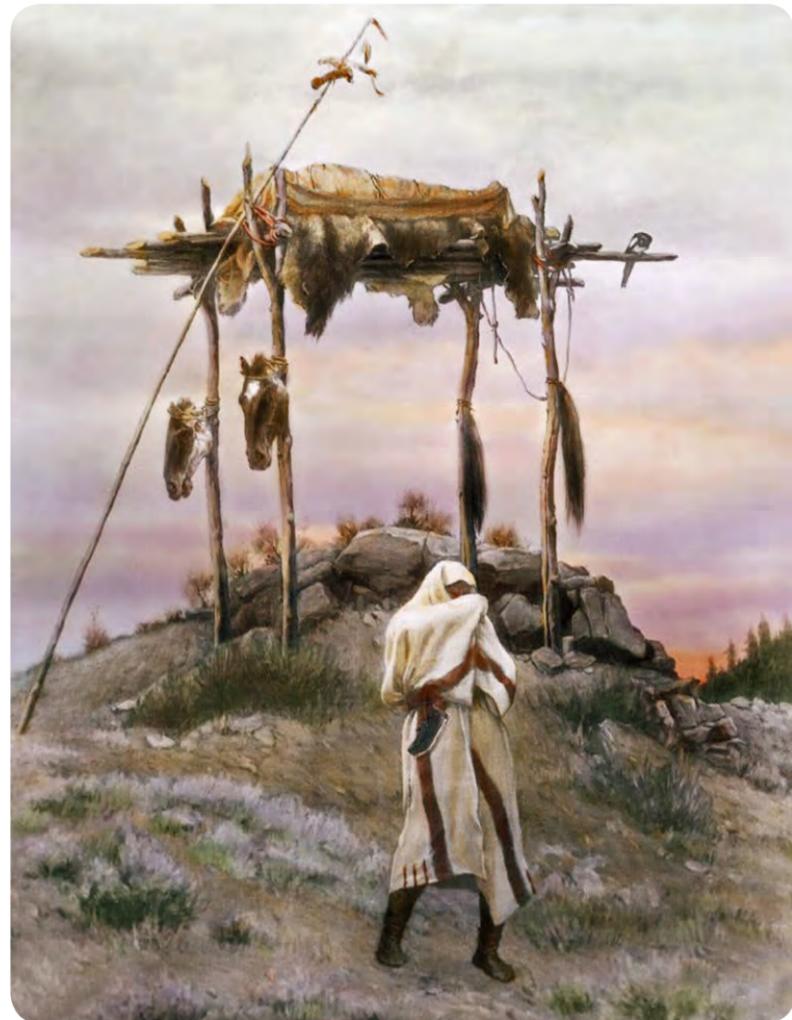
View of pine forest, camp. #510



Hunting party. #508



Big camp on a summer night. #652



Platform grave with horse heads. #276a

All photos are from the Beinecke Rare Book and Manuscript Library, Yale University.



Fall splendor on the Rocky Mountain Front. Jeff Van Tine

CC | GY

LOSING THEIR BEST FRIENDS



THIS PAST YEAR, A PALL WAS CAST OVER THE WILDLANDS, RUGGED MOUNTAINS WEPT, AND THE MIGHTY GRIZZLY, POLAR, BLACK AND BROWN BEARS HUNG THEIR HEADS IN SADNESS... FOR THEY HAD LOST TWO OF THEIR BIGGEST FANS, STRONGEST ADVOCATES, AND MOST ARDENT SUPPORTERS.

UPON THEIR PASSING, REVERED BIOLOGISTS CHUCK JONKEL, 85, AND JOHN CRAIGHEAD, 100, LEAVE BEHIND A LEGACY OF CONSERVATION, CARING, RESEARCH, AND EDUCATION. BOTH MADE GROUNDBREAKING STRIDES IN THE STUDY OF BEARS, THEIR HABITAT, AND MIGRATION PATTERNS.

On April 12, 2016, teacher, activist and conservationist Dr. **CHARLES "CHUCK" JONKEL** died at the age of eighty-five.

After receiving two degrees in science from the University of Montana, and a Ph.D. in zoology from the University of British Columbia, Jonkel was hired by the Canadian Wildlife Service to research and run the first ever field studies of polar bears in the arctic.

In the early 70s, Jonkel returned to Montana as a wildlife biology professor with the University of Montana's Environmental Studies program. Once grizzlies were put on the Endangered Species list in 1975, it didn't take long for Jonkel to see the need for grizzly bear habitat in north western Montana and up into Canada. Consequently, his creation of the internationally important Border Grizzly Project, became the most all-encompassing, wide-spread study of



grizzlies and their habitat ever conducted, which influenced forest management policies concerning the effects logging and recreational activities have on wildlife. The work done by the Border Grizzly Project has had a direct impact on helping grizzly bears recover from the approximate 390 then to the more than 1,000 today.

In the 1980s, Jonkel worked with UM students looking for a non-lethal way to deter bears when they began testing pepper spray. Their research led to the present-day bear sprays that are the best plan of defense against bear attacks.

To accurately portray wildlife, he founded the International Wildlife Film Festival in Missoula. He also founded the Great Bear Foundation in 1981, a Missoula-based organization dedicated to protecting grizzly, black and polar bears across North America.

After retiring as a wildlife biology professor at UM, Jonkel continued his passion to reach out and help people better understand bears, to reduce bear-human conflicts, and to ensure the protection and conservation of grizzlies.

Chuck Jonkel, you will be missed.

Dr. **JOHN CRAIGHEAD**, conservationist and defender of wildlife, died on September 18, 2016 at the age of one hundred.

It is difficult to speak of John's life and accomplishments without including his twin brother, Frank, in the discussion.

Throughout their lives, the Craigheads were champions of wilderness and the animals who called it home. In 1998, the Audubon Society named the two among America's top scientists of the 20th century. Frank Craighead died in 2001 at the age of eighty-five.

The twins attended Penn State and in 1936, and both received doctorate degrees from the University of Michigan in 1949. In the early 1950s, Frank worked back east, while John accepted a position with the University of Montana where he was head of the Montana Cooperative Wildlife Research Unit for 25 years.

Around 1959, Frank and John's careers merged once again. The two began a decade-plus study of grizzly bears in Yellowstone National Park. Pioneering and perfecting techniques of tranquilizing grizzlies—so they could be outfitted with radio collars—and radio-tracking technology, the Craigheads discovered that the bears often moved outside of the Park and onto surrounding National Forests. Based on these data, they established the concept of the Greater Yellowstone Ecosystem. This model came to be used for all large animal management in the region and is still in effect forty years later. Their study is credited with helping save these great bears from extinction.

John was granted The Wildlife Society's prestigious Aldo Leopold Memorial Award in 1998 and in 2005, the University of Montana endowed the John J. Craighead Chair in Wildlife Biology.

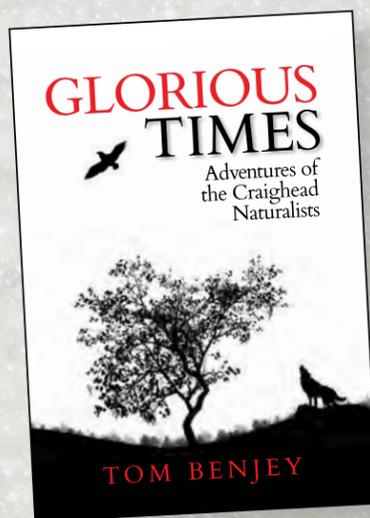
John and Frank... you will be missed.



Chuck Jonkel just being Chuck. Frank Tyro



John Craighead. Sam Beebe/ECOTRUST



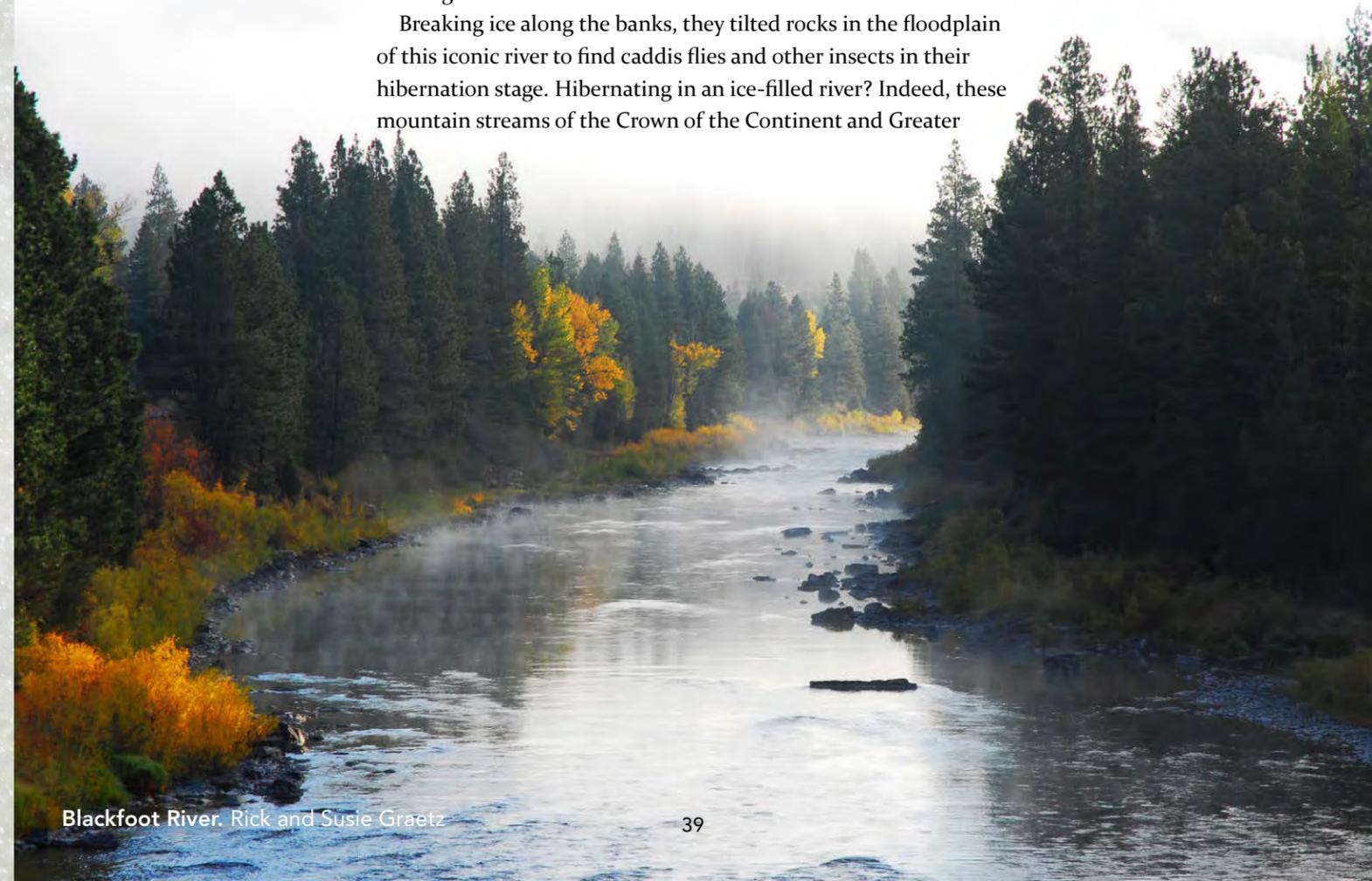
Glorious Times. Adventures of the Craighead Naturalists, a biography of this multi-generational, Scots-Irish American family of scientists and naturalists, by Tom Benjey and published by UM Press, will be out this fall. Find it through the UM Bookstore or your local bookstore.

LIFESAVING RIVERS

by F. Richard Hauer, Harvey Locke, Victoria J. Dreitz, Mark Hebblewhite, Winsor H. Lowe, Clint C. Muhlfeld, Cara R. Nelson, Michael F. Proctor and Stewart B. Rood

A stiff wind, a driving snow squall, and a temperature hovering near 10°; winter in the North Fork of the Flathead was living up to its billing. Yet, to the 20 students from the University Montana, it didn't matter because they were touching and seeing much of what they learned in the classroom. And it didn't hurt that they were gazing at the colossal rising summits of Glacier National Park's western frontier fading in and out of the swirling clouds.

Breaking ice along the banks, they tilted rocks in the floodplain of this iconic river to find caddis flies and other insects in their hibernation stage. Hibernating in an ice-filled river? Indeed, these mountain streams of the Crown of the Continent and Greater



Yellowstone, such as the Belly, Teton, Sun, Snake, Gros Ventre, Wind, Green, Upper Yellowstone, Gallatin, Jefferson, Madison, the North, Middle and South forks of the Flathead, and many other mountain flows are teeming with year-round life provided by the gravel consistency of the streambeds.

Why river floodplains are key to preserving nature and biodiversity not only in the Crown and Greater Yellowstone ecosystems, but in all of the western US and Canada

Although they may not commonly be viewed as hotspots for biodiversity, gravel-bed river floodplains are by far the most important feature for nature across the landscapes of western North America. This is because gravel-bed rivers disproportionately create high diversity of habitats, concentrate nutrients for growth, and provide corridors to link populations of species that would otherwise become isolated.

More than just river channels carrying water off the landscape and channels used by fish, gravel-bed rivers are essential to the life requirements of a wide variety of aquatic, avian and terrestrial species from microbes to grizzly bears.

What's more, a recently published article authored by Hauer and an interdisciplinary team of colleagues, stated that gravel-bed river floodplains will be critically important for native species under the increasing pressures of climate change now and in the future.

Home to many creatures

Unlike meandering sand- and silt-bottom rivers like the Missouri and Mississippi, gravel-bed rivers flow over deep beds of gravel and cobble that form floodplains which function somewhat like a sponge.

These types of rivers and floodplains create a network of complex habitats and corridors of connectivity across the mountain west of the United States and Canada, a landscape once covered by glaciers. In our shared mountain region from Yellowstone to Yukon, the complex habitats of gravel-bed rivers are maintained through time by flooding, channel and gravel movement, and new life.

Although occupying less than three percent of the area, gravel-bed river floodplains contain over half of the region's plant diversity. More than 70 percent of the region's bird species use these river floodplains for some critical stage of their life. The large, iconic deer and elk use them year-round, but most extensively in winter as they look for food and habitat.

Wolves not only follow the elk or caribou around, but den almost exclusively on river floodplains. Gravel-bed rivers are also critically important sites for grizzly bears, particularly early in the spring as they emerge from hibernation and are looking for tender shoots of vegetation.

These gravel-bed rivers have large volumes of water that penetrate the cobble and gravel of the floodplain, only to return to the river channel kilometers downstream. In the gravel-bed rivers themselves, trout and salmon feed on aquatic insects that live on the river channel bottom. Fish also eat the insects that live

hundreds of meters out from the river channels in the gravels of the floodplain and that migrate back to the channel to emerge as adults.

The exchange of water, nutrients, and insects between the floodplain and the river channel feeds the river and cools the channel in the summer and keeps them warm in winter. Many of the trout and salmon of our western rivers are dependent on this water, temperature, and food exchange between the river channel and the floodplain for proper spawning sites. Moose, elk and bears all need the spring grasses and herbs that come early on the floodplain because of the surface water and groundwater exchange.

Under pressure

Despite their ecological productivity, however, floodplains are among the most endangered landform types worldwide.

They are flat, rich, and attractive areas with abundant water for municipalities, agriculture and recreation. In most mountainous systems, they are the first to be converted to permanent human settlement, agriculture, industry, and developed for transportation.

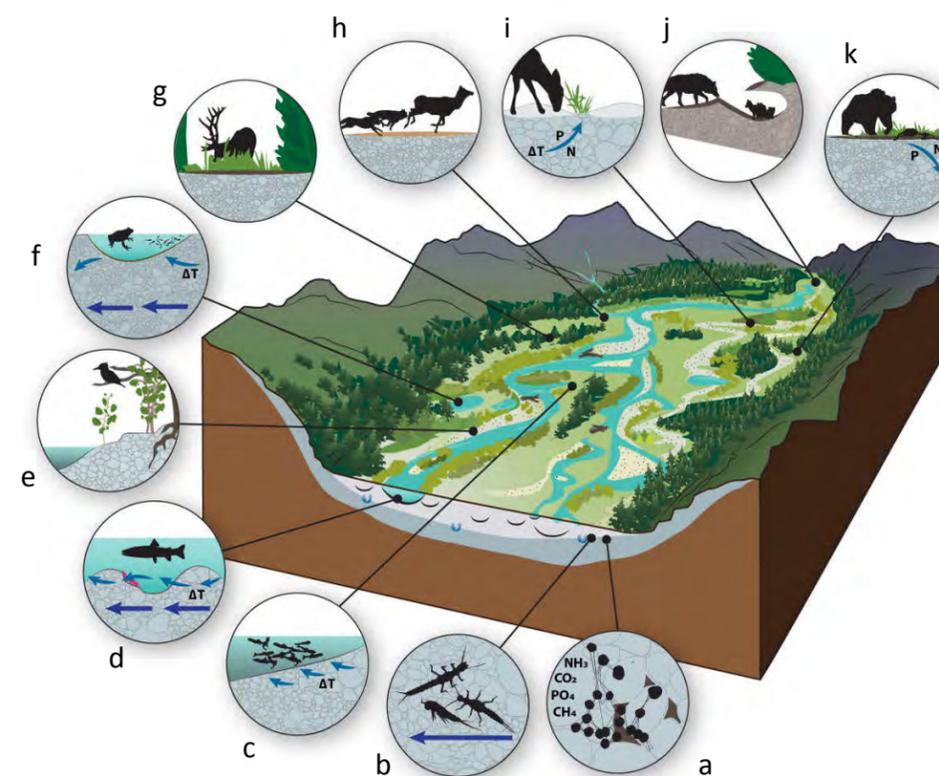
While there are many protected areas in the northern Rocky Mountains of the United States and Canada – Yellowstone and Banff National Parks are two examples – humans have altered the structure and function of the gravel-bed river floodplains both outside and inside these protected areas.

Many of the region's cities such as Calgary, Missoula, and Kamloops in British Columbia, were pioneered along the edge of river floodplains when these rivers were important for commerce. Virtually every city near a river has deliberately encroached onto the neighboring floodplain and subsequently built levees and hardened structures, such as rip-rap to prevent flooding and damage to infrastructure. Unfortunately, these prove to be inadequate when very large, but highly repeatable floods occur.

As the effects of a rapidly changing climate take hold, gravel-bed river floodplains will play a vital role in sustaining both nature and culture. Indeed, climate change will further stress habitats and populations that already have been impacted during a century of development, which threatens the sustainability of the entire region's biodiversity.



Elk herd crossing gravel-bed river. H. Bohm



Gravel-bed river floodplains are the ecological nexus of glaciated mountain landscapes

Illustration shows the complexity of the shifting habitat mosaic, the biophysical interactions among organisms from microbes to grizzly bears, and the importance of gravel-bed river floodplains in glaciated mountain landscapes; (a) microbes of the interstitial spaces of the gravel-bed showing the products of processing of organic matter in the subsurface, (b) crustaceans and insects that inhabit the gravels of the floodplain, (c) temperature modification of surface habitats from upwelling hyporheic zone waters, (d) spawning by native fishes in floodplain gravels, (e) riparian obligate birds, (f) amphibian spawning in floodplain ponds and backwaters, (g) ungulate herbivory of floodplain vegetation, (h) wolf predation on ungulate populations, (i) early spring emergence of vegetation, (j) wolf dens located along floodplain banks, (k) use by grizzly bears and other carnivores for landscape connectivity and sites of predation interactions.

Illustration of the river floodplain dynamics Emily Harrington, Illustrator



Bull trout. J. Armstrong

For example, trout and salmon are especially vulnerable to climate change, because their survival is dependent, from eggs to juveniles to adults, on an abundance of clear, cold, connected and complex habitats that are concentrated on gravel-bed river floodplains. Likewise, birds, deer, elk, and large predators are dependent on the complex mosaic of habitats that are impacted by dams, municipalities and housing developments.

Gravel-bed river valleys, when changed by human populations and infrastructure, fragment these wildlife populations. But these changes can be reversed or mitigated by managing floodplains to better resemble their natural state of flooding and channel movement around on the floodplain.

Change in conservation practices

Throughout North America the ecological restoration of streams and rivers has primarily focused on increasing habitat heterogeneity, or complexity, in a static fashion. The most common practice in stream restoration has been reconfiguring channels and adding boulders, large wood structures and channel-spanning weirs to enhance habitat and restore biodiversity.



Sunrise on the Gros Ventre River. Dave Brezaira/Flickr

However, these approaches have been shown to be largely unsuccessful because they often lack restoration of the natural dynamics of rivers interacting with their riparian zones.

Rather successful river restoration and re-naturalization has been achieved along tens and even hundreds of kilometers of gravel-bed river by reintroducing naturalized flooding regimes. These restore the dynamics of gravel and cobble movement of the channels and create new habitat for plant succession and a diversity of animals.

Many of the great rivers of the world originate in mountainous regions where gravel-bed rivers and floodplains play an essential role in the biodiversity of life in that region and in the quality of human well-being. An overriding question remains: How do we resolve the enormous gap between what scientists know is needed to maintain and restore functioning floodplain and gravel-bed river systems on the one hand, and the neglect by land-use managers, energy-planners and society as a whole on the other?

Implementing conservation policies that reflect this scientific understanding will require a paradigm shift from conservationists and river managers alike to prioritize maintaining natural dynamic rivers where they exist or restoring them wherever compromised.

Regional biodiversity in the interior mountains of western North America will depend on the natural processes of gravel-bed rivers and their floodplains to sustain our fisheries, birds, deer and elk, and our carnivores.

F. Richard Hauer^{1,2}, **Harvey Locke**³, **Victoria J. Dreitz**⁴, **Mark Hebblewhite**^{4,5}, **Winsor H. Lowe**^{4,6}, **Clint C. Muhlfeld**^{2,7}, **Cara R. Nelson**⁵, **Michael F. Proctor**⁸ and **Stewart B. Rood**⁹

¹ Center for Integrated Research on the Environment/University of Montana (UM).

² Flathead Lake Biological Station/UM.

³ Yellowstone to Yukon Conservation Initiative

⁴ Wildlife Biology Program, College of Forestry and Conservation/UM.

⁵ Department of Ecosystem and Conservation Sciences, College of Forestry and Conservation/UM.

⁶ Division of Biological Sciences/UM.

⁷ USGS, Northern Rocky Mountain Science Center/GNP.

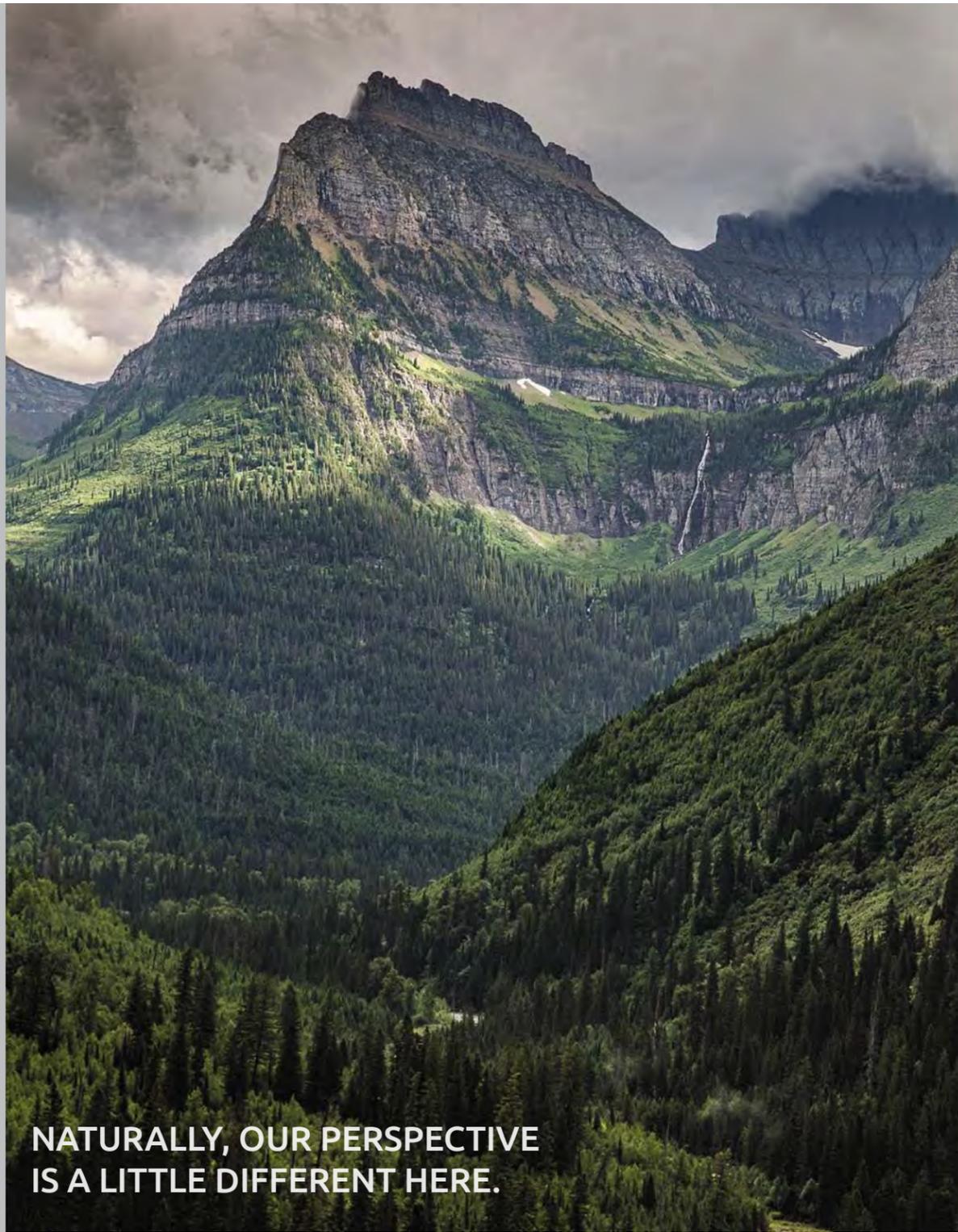
⁸ Birchdale Ecological.

⁹ Department of Biological Sciences/University of Lethbridge.



This study was financed by the **Montana Institute on Ecosystems (IoE)**, an accessible, state-wide institute that promotes inclusion to all establishments of higher education within Montana, state agencies, NGOs, and private industry with interests in ecosystem sciences. Serving as a research and education portal on ecosystem sciences to the citizens of Montana and the nation in general, the IoE has created the Montana University System (MUS) Institute on Ecosystems, which, with dual administrative hubs at MSU-Bozeman and UM-Missoula, will be able to leverage research conducted across the entire Montana University System.

Above: Canada's Belly River. Rick and Susie Graetz



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GY
GREATER YELLOWSTONE



Specimen Creek, YNP. Rick and Susie Graetz

Making Bears Behave

by Kerry A. Gunther & Mark A. Haroldson

Yellowstone bears spend up to six months hibernating in winter dens without eating or drinking. Because of the long period of fasting and the need to accumulate large fat reserves for hibernation, bears are a very food motivated species for the 3-4 months prior to den entrance. This food motivation combined with their intelligence, adaptability, and omnivore generalist lifestyle, allows them to quickly learn to exploit new food resources, especially high-calorie anthropogenic (human-introduced) foods. Shortly after the establishment of Yellowstone National Park, grizzly bears and black bears learned that people and their camps, developments, and garbage piles provided easy sources of concentrated,





How times have changed... Superintendent Horace Albright treats bruins to brunch. YNP

energy-rich foods. In addition, many bears became bold enough to break into tents, buildings, and vehicles to obtain anthropogenic foods, often causing considerable property damage and sometimes injuring people in the process. Although lethal removal of food-conditioned bears provided a short-term solution to the problem, many park visitors, staff, and managers were opposed to this strategy and instead sought non-lethal methods to change bear behavior. Aversive conditioning is one method of attempting to modify undesirable behavior in wildlife. In the context of bears in Yellowstone, aversive conditioning is defined as the use of negative stimuli in an attempt to permanently alter a bear's behavior, with the goal to reduce human-bear conflicts. Attempts at aversive conditioning of bears date back to the early history of the park.

During the park's infancy, prior to implementation of formal bear management programs, there was some informal management being practiced. Bears that entered permanent camp facilities, where visitors could rent tent-cabins by the night, were sometimes fed meat with broken glass in it or sponges fried in grease. These efforts may have been intended to kill the problem bears, or to make them miserable enough (a form of taste aversion) to teach them to stay out of the tent-camps.

C.J. "Buffalo" Jones, a colorful, old frontier character, who was appointed as Game Warden of the park in 1902, conducted one of the earliest formal attempts at aversive conditioning of bears in the park. Jones' flowery and sometimes biblical descriptions of his duties provide us with interesting insights into his early attempts at modifying undesirable bear behavior. In his own words:

When I arrived at the Park, it did not take long to find that the bears were making life miserable for the people who were trying to camp through Wonderland. In fact, they were molesting the hotels and road camps, where the men were stationed to build new roads.

Even the old veteran road builder, Mr. Kelly, who had in charge, a hundred or more men, told me in a tremulous voice "either me or the bars has got to git out of the park", and Capt. Waters, who with his family lived at the lake, and had the transportation of passengers across that delightful and picturesque body of water, was tired of his ruffian neighbors of the forest. But the men who suffered the most, at least in feelings, were the men who had charge of the dairies at the various hotels. The bears must have surely migrated from Canaan, where flowed the milk and honey, for their fondness for the one, is only exceeded by their greed for the other, and just as sure as a pail of milk was out of the hands of a milkman, a bear would have his snout in the pail, and if the man dared to interrupt and pressed him too hard, he would seize the rim of the bucket, and scamper off to the woods, and that was the last of the pail, to say nothing of the milk.

The situation was just this: either the bears must be killed, made wild again, or the Park must be closed to traffic and pleasure parties. To be sure the last proposition was not to be considered, so either they must be killed or made wild. It would require drastic measures to accomplish this latter measure, for so much affection had been lavished upon them by the maids, they had become very gentle. When it was passed around that I intended to punish the creatures to make them afraid of their friends, I had the whole park up in arms against me. The managers of the hotels said it would interfere with their custom, for the tame bears were one of the chief attractions, and the girls nearly went into hysterics when my plans were known.

I saw that something desperate would have to be done, and I tried pelting the intruding animals with fine mustard shot, thinking to sting them good, and make them shy. This helped a little, but did not prove altogether satisfactory. I then arranged a block and tackle, with ropes over a large limb of a tree, dropped a noose on the garbage heap where the bears came to feed, and when a bear stepped into it, pulled the rope until it was securely about the foot, then with the aid of a soldier or tourists, drew him up until they stood on two feet and with a smart willow switch, I gave it a severe chastisement. This new method of treatment rather caught the bears unawares and appeared to break their spirit for to be detained against their will is a disgrace to wild



Top: R. Robinson/YNP
Bottom: Tom Brandt/Flickr

... bears are likely to make themselves familiar whenever they find camps in their domain and are given encouragement by the presence of garbage or unprotected food...

creatures and they remember their punishment all their lives and teach their offspring to beware, being sure that every men's hand contains a willow switch and a rope.

However, by 1905 park management had ordered Buffalo Jones to quit the practice, and he resigned his position as Game Warden shortly thereafter.

In the 1940s, bears were still causing considerable property damage and still inflicting injuries on many park visitors; therefore, experiments with aversive conditioning to keep bears out of developments continued. In 1943, wildlife biologist Olaus Murie was assigned the task of studying the life history of the park's bears. In his 1943 progress report on the "Yellowstone Bear Study," Murie stated:

The bear situation in the Yellowstone is by no means unique... bears are likely to make themselves familiar whenever they find camps in their domain and are given encouragement by the presence of garbage or unprotected food... The bears seem to lose all fear and reach the point where they are not unduly alarmed when hit with sticks or stones to drive them away, or when shot at, or otherwise harassed by irate campers who have suffered bear depredations. The bear retreats far enough to get out of the way, then goes the rounds seeking new advantages.

Murie described an experiment where he used an electronic cattle prod attached to a long pole to administer aversive conditioning to black bears in an effort to get them to stay out of the Fishing Bridge Campground. Murie stated:

I am convinced that the electric prod held in the hand, or any similar device, is not effective. In fact, any punishment inflicted personally, in such a manner that it is obvious to the bear that a person is involved, is not likely to work. Experience has shown that the bear learns to recognize the particular person or car that administers the shock or other punishment, and he simply avoids that person or car in the future, but does not fear other persons or cars.

Murie concluded it was very difficult to drive bears off once they had acquired the habit of seeking garbage near human dwellings.

There is ample natural forage for bears and garbage is not required to support the bear population. It is further concluded that although the bear is largely a vegetarian, it has a strong desire for meat and foods included in garbage and that its actions are unquestionably influenced by the presence of such food resources. It is pointed out that the bear is a shrewd, unusually resourceful animal, easily adaptable to many situations, easily tamed in the presence of men, and that therein lies our problem. Another fact enters the problem—misconceptions in the minds of tourists, their assumption that the park bear is a harmless or semi-domesticated animal. Driving bears away, inflicting punishment on them personally, are no permanent help. Electronic devices have proven fairly successful, when operated automatically and dissociated from the presence of man. It is planned to continue food habits studies, with special attention to spring and early summer, and the relationship with elk in the calving season. It is also planned to experiment with electric devices on garbage



It is pointed out that the bear is a shrewd, unusually resourceful animal, easily adaptable to many situations, easily tamed in the presence of men, and that therein lies our problem.

cans and car windows as deterrents in special cases, to cure certain individual bears of their raiding habits. It is recommended specifically to produce a bear-proof garbage container as the first step, and obtain full cooperation of the concessionaire, prior to any intensive program of enforcing regulations on tourists.

By the mid-1970s, the park had successfully solved most of its bear problems associated with bears conditioned to human foods, and aversive conditioning was no longer necessary. However, by the early 1980s a new management challenge had surfaced. Bears that were habituated to people, but not conditioned to human foods, began foraging on natural foods in roadside

meadows in close proximity to park visitors. With this new challenge and in an effort to prevent bear-jams and associated traffic congestion, aversive conditioning resurfaced as a potential method to keep bears from roadside meadows during daylight hours. In addition, aversive conditioning was used to teach bears to stay out of developed areas.

In the 1980s, the park began deploying what was referred to as the "Bear Thumper Gun," which used a black-powder charge to fire 3-inch plastic bottles filled with water. The bottles had a wide surface area and collapsed upon impact. The theory was to inflict pain on bears without risk of penetration, injury, or death. The Bear Thumper Gun was used in combination with a portable public address (PA) system that played taped calls of California quail, a species not found in Yellowstone. The idea being that bears would associate the quail call with the pain inflicted by the Bear Thumper Gun, so they could eventually be made to leave the roadside or development simply by playing the quail call. Driving through the Bridge Bay Campground, with the call of the California quail blaring over the PA system, most visitors went about their normal business of setting up tents, grilling burgers, etc., without taking any notice of the quail call at all.

If lucky, with the Thumper Gun, one might hit a bear at 30 yards—beyond that range you could not expect to hit much. Regardless, when feeding on natural foods along roadsides, bears learned to move just out of range (35-40 yards) anytime the gun was pulled from the truck. Bears seemed to recognize park vehicles, uniformed park staff, and the distance at which the gun could be effectively fired. They also appeared to have a much greater pain threshold and tolerance to hazing than the park had staff and budget to counteract. Bears had beaten yet one more attempt to modify their behavior.

Bears are no longer routinely hazed from roadsides because teaching bears to avoid



Professor Yogi Bear teaches a lesson. YNP

miles of roadside habitat containing abundant natural foods cannot be implemented on a consistent basis and is cost prohibitive.

Presently, a combination of 12-gauge shotgun-fired cracker shells, bean bag rounds, and rubber bullets are used to haze bears away from developments. With consistent application, the park has had some success at teaching individual bears to skirt around developments rather than walking through them. The success is likely attributable to several factors, including: 1) providing bear-proof food and garbage storage; 2) trained personnel are usually present and able to quickly respond to haze bears, allowing the consistent application of hazing that is critical to modifying bear behavior; 3) developments have somewhat distinct geographical boundaries (pavement) identifiable to bears and staff, allowing for hazing to be consistently applied; and 4) developments are areas of concentrated human activity with associated noise and odor.

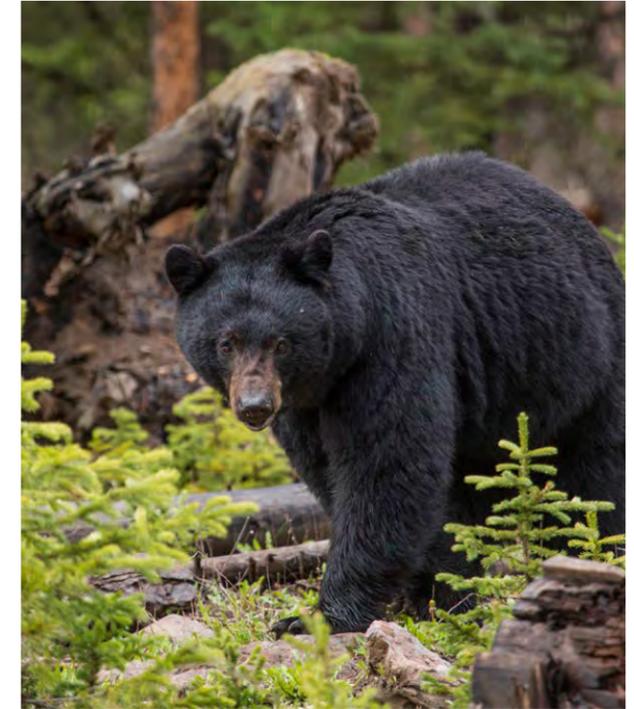
Aversive conditioning is not a solution to habituation or food conditioning in bears. It is simply another tool, secondary to visitor education, enforcement of regulations for food storage, and wildlife approach distances. The dilemma for park managers is how to balance the needs of bears with the expectations of park visitors while providing for the safety of both, and at the same time remaining within fiscal constraints. The next challenge is to find innovative, cost-effective ways to manage the large numbers of visitors who want to view, photograph, and experience bears, or to

develop cost-effective methods to prevent habituation in the face of ever increasing park visitation. In the meantime, highly intelligent and remarkably adaptable grizzly and black bears are habituating and learning to coexist in close proximity to people, so they can survive in a landscape that is increasingly dominated by humans.

Kerry A. Gunther, YNP's lead bear management biologist, received a master's degree in fish and wildlife management from Montana State University.

Mark A. Haroldson, USGS Supervisory Wildlife Biologist for the Interagency Grizzly Bear Study Team received a wildlife biology degree from, and did graduate-level class work at, the University of Montana.

This article is from volume 23, issue 2 of *Yellowstone Science* 2015



Neal Herbert/YNP

Tourist Ed 101

Yellowstone National Park go.nps.gov/bearspray

A bear doesn't care how old you are.

Park Ranger Sarah Haas and son Teo

Carry bear spray. Know how to use it. Be alert. Make noise. Hike in groups. Do not run.

Despite professional efforts to influence their behavior, YNP's bears mostly continue to do what they want, forage where they want, and travel where they want. In a switch from all of the bear modification programs ever used, YNP has implemented a new course of action... **instead of training the bears, Park rangers are working to educate and train the tourists.**

Whether hiking, fishing, wildlife-watching, or photographing, if you are on a trail, YNP wants you to carry bear spray. The campaign called "A Bear Doesn't Care" encourages visitors to carry and know how to use the spray—no excuses! Their message is clear: no matter who you are or what you are doing, bear spray is essential for your safety.

For more information go to: bearaware.com and <https://www.nps.gov/yell/planyourvisit/bearsafety.htm>

Yellowstone National Park go.nps.gov/bearspray

A bear doesn't care if you took its picture.

Ronan Donovan National Geographic Photographer

Carry bear spray. Know how to use it. Be alert. Make noise. Hike in groups. Do not run.

Yellowstone National Park go.nps.gov/bearspray

A bear doesn't care if you climbed to the top of the world.

Conrad Anker Alpinist

Carry bear spray. Know how to use it. Be alert. Make noise. Hike in groups. Do not run.



“TUFF” HIKING

by Brian Baker

Menan Buttes and the Snake River plain.
James Neeley, JamesNeeley.com

THE NORTH MENAN BUTTE,

located just outside Rexburg, Idaho, has been one of my favorite hikes for a long time. I've climbed it at sunrise and sunset, in winter and in summer. When I get the itch to get outside and leave civilization behind for a while, this is where I go. Despite my fondness for the butte, it was only recently that I began learning the true significance and appeal of this landmark.

Roughly 10,000 years ago, in what is now Madison County, Idaho, volcanic eruptions spewed magma up through the Snake River. The cold water cooled the magma before it had a chance to crystalize, creating a type of glass called tachylite. The steam from the superheated water shattered the glass into tiny fragments, which settled among the ash.

These eruptions formed what are now known as the North and South Menan Buttes, which are a type of extinct volcano known as “tuff cones.” This kind of phenomenon happening in fresh water is extremely rare; in fact, these buttes are the only freshwater eruptions that have occurred in the United States, and the Menan Buttes are among the largest tuff cones in the world. The larger of the two is the North Menan Butte, the cone of which is about 6,000 feet in diameter.

This information about the geological history of the buttes was a revelation to me. I had no idea that the large hill I had hiked numerous times was actually a rare volcanic artifact.

While the South Menan Butte is privately owned, the North Menan Butte is maintained by the Bureau of Land Management (BLM), which has designated it as an Area of Critical Environmental Concern (ACEC). The National Parks Service has also included the North Menan Butte in its National Natural Landmark (NNL) program. These designations were given because of the butte's rare geological



L-Aerial, infrared photo of South and North Menan Buttes and the Snake River. Ben Townsend

THE BUTTE IS A NATURAL GEOLOGICAL MUSEUM WITH A LARGE AND VARIED COLLECTION.



Installed in 2007 by the BLM to allow better public access, the trail is sandy and rocky, but well maintained. Interpretive signs along the way give information about the wildlife and geology of the area. It's a popular hike for local families, college students, trail runners, and nearby school districts to explore.

While it's not a long hike—in fact, the summit is only about 800 feet above the desert floor, it is still moderately difficult because of its rapid elevation gain. At the steepest point, a chain runs parallel with the trail, allowing hikers to use their

hands to pull themselves up the slope.

Once you reach the top, you can enjoy the view and head back down, or you can continue your hike on a loop that takes you around the ancient volcano rim. With some minor scrambling, you can also explore the inside of the crater.

The view from the crest is stunning. Rexburg, Idaho Falls, and other nearby towns, as well as mountain ranges on the east and west add texture to the landscape. Twisting tributaries of the Snake and Henry's Fork rivers meander through the valley, and when set ablaze by the reflection of the sun, they appear as veins of silver, the lifeblood of the earth.

R Mountain may not be as spectacular as some of the other

peaks I've climbed, but I've hiked it half a dozen times now, and it remains one of my favorites in Southeast Idaho. Short enough to summit in an afternoon—yet difficult enough to offer a challenge, the view alone is grand enough to make it worth the trouble, and the subtle beauties of the rocks and wildlife keep me coming back for more. It may not be as majestic as the Grand Teton or Old Faithful, but the rarity of this landmark makes it a geological treasure, just as unique and just as important as its more famous counterparts.

Brian Baker graduated from Brigham Young University-Idaho with a bachelor's degree in English and currently works as a content writer and social media manager. He enjoys writing, learning, and climbing mountains.

features, and they help protect the butte for preservation and research while also welcoming visitors.

Near the top of North Menan on its eastern slope is a giant, painted white R, which gave the butte the nickname "R Mountain." Visible from Rexburg, the R originally stood for Ricks College, a two-year institution, which became Brigham Young University-Idaho (BYU-I) in 2001. When the icon was created, there was no permit to govern how it would be maintained; however, the BLM worked out an agreement allowing the college to keep it up.

After the college became BYU-Idaho, the BLM convinced the university not to renew their permit so the natural features of the butte could be better preserved. However, the R had become an important landmark to the community, and the

university didn't want it dismantled. So an agreement was reached that the R would stay, but no longer be maintained. It's faded now, and despite the wear of time, is still visible from town.

Surrounded by desert, the butte seems like a barren place. A few gnarled trees stand bravely in their sparse environment, encircled by ever-present prairie grass and sagebrush. Surprisingly, it is actually teeming with wildlife. Deer, rabbits, porcupines, skunks, lizards, a variety of birds, and an occasional rattlesnake all make the butte their home. Lichens splatter rocks with white, yellow, and orange, and wildflowers like bluebell and Indian paintbrush splash vibrant colors against the harsh backdrop of the desert.

Covered with strange formations,

much of the butte's beauty comes from its rock: lonely volcanic spires jutting into the sky, small caves large enough for several people to crawl inside, xenoliths (one type of rock jutting out from another type), and rippling red rock that undulates along the slope and in the crater. The butte is a natural geological museum with a large and varied collection.

With the Teton Mountains looming on the horizon and Yellowstone National Park within driving distance, Rexburg is surrounded by great hiking opportunities, yet many of these trailheads are several hours away. The North Menan Butte is about 12 miles west of Rexburg, making it a good option if you live in, or are passing through, the area and want to get out for a short hiking adventure.





Yellowstone Lake

A HAUNTING MYSTERY

by Pat Hill

It's been referred to as music, a hum, or a whisper, but an explanation of a mysterious noise that has been heard by some people over Yellowstone Lake has never been found.

"There are only guesses [as to] its origin," Yellowstone Park Historian Lee Whittlesey said recently. "I've never heard the sounds...and I've listened long and hard in the back country." But Whittlesey, who added that he does not know anyone personally who has heard the strange sounds, reiterated that the noise has been noted by several reliable sources since the early days of the Park's exploration, including scientists, and that the mysterious noise has also been noticed in the vicinity of Shoshone

Lake, to the south of Yellowstone Lake.

The first written account of the surreal resonance at Yellowstone Lake was recorded in 1872, the same year Yellowstone was established as the world's first national park.

"While getting breakfast, we heard every few moments a curious sound, between a whistle and a hoarse whine, whose locality and character we could not at first determine," wrote F.H. Bradley, a member of the 1872 Hayden Expedition surveying the Park region. It was soon surmised that the sound seemed to be emanating from somewhere in the atmosphere over the lake itself, but the noise remained a mystery.



"It begins softly in the remote distance," "a surreal resonance," "music on the lake," have you heard it? Dianne White

A most singular and interesting acoustic phenomenon of this region, although rarely noticed by tourists, is the occurrence of strange and indefinable overhead sounds.

Captain Hiram Martin Chittendon, of the Army Corps of Engineers, wrote the first official account of the Yellowstone Lake hum in his "Historical and Descriptive" journal of the Park that was published in 1895. Chittendon penned, "A most singular and interesting acoustic phenomenon of this region, although rarely noticed by tourists, is the occurrence of strange and indefinable overhead sounds. They have long been noted by explorers, but only in the vicinity of Shoshone and Yellowstone Lakes. They seem to occur in the morning, and to last only a moment. They have an apparent motion through the air, the general direction noted by writers being from north to south..."

In his journal, he also included some "earwitness" reports, including an 1892 account by a Mr. Edwin Linton comparing it to "a medley of wind in the tree tops... the echo of bells after being repeated several times, the humming of a swarm of bees, and

two or three other less definite sources of sound, making in all a composite which was not loud, but easily recognized, and not at all likely to be mistaken for any other sound in these mountain solitudes." Another member of Linton's group described the noise as "a twisting sort of yow-yow vibration," and Linton's guide, Elwood Hofer, said it was "the most mysterious sound heard among the mountains."

Chittendon also included the memories of S.A. Forbes, a scientist who wrote in 1893 that, "It put me in mind of the vibrating clang of a harp lightly and rapidly touched high up above the tree tops, or the sound of many telegraph wires swinging regularly and rapidly in the wind, or, more rarely, of faintly heard voices answering each other overhead. It begins softly in the remote distance, draws rapidly near with louder and louder throbs of sound, and dies away in the opposite direction; or it may seem to wander

irregularly about, the whole passage lasting from a few seconds to half a minute or more."

"No rational explanation has ever been advanced for this remarkable phenomenon," concluded Chittendon in 1895. "Its weird character is in keeping with its strange surroundings. In other lands and times it would have been an object of superstitious reverence or dread, and would have found a permanent place in the traditions of the people."

The noise continued to be noted well into the 20th century. Geologist Clyde Max Bauer, who also served as the Park's chief naturalist, recorded that he heard the noises, and YNP historian Whittlesey conveyed that Bauer's friend, Park photographer Jack Haynes—who also heard the hum, wrote in 1924 that the noise was "unlike anything I've ever heard before." Bauer said that the ethereal noise heard by himself and Haynes was often

referred to as "the music of the Lake."

"The writer has heard this 'music on the Lake' on several occasions," wrote Bauer in his book *Yellowstone: The Underworld*, "and during the summer of 1933, Ranger Verde Watson, who was then caretaker at the Lake Museum, heard the sound nearly every morning for a month or more."

Bauer's description of the mysterious "music" over Yellowstone Lake was similar to earlier accounts of the phenomenon, as noted in a story in the Eugene, Oregon *Register-Herald* dated February 24, 1965. Bauer reported that "The sounds resemble the ringing of telegraph wires or the hum of bees, beginning softly in the distance, growing rapidly plainer until directly overhead and then fading rapidly in the opposite direction."

The noise has been blamed on everything from flocks of birds in flight to erupting volcanic gases, or the grounding of static

To this day no one has a satisfactory explanation. We just don't know what causes that ethereal sound.



Humming vibrations from wind-brushed burnt trees? Geraldine Curtis

electricity in the lake. The *Register-Herald* reported in their 1965 story that some people even “contend the strange sounds don’t come from the lake itself, but from nearby glacier-pocketed peaks whose jagged rock faces deflect the winds.” But John M. Good, the Park’s chief naturalist in 1965, told the *Register-Herald* that “So far no one has the faintest proof of what causes them.”

Whittlesey related that the mystery endures. When he appeared on a Travel Channel special outlining the mysterious noises at Yellowstone Lake last year, the Yellowstone Park historian also discounted any ghostly origins for the commotion, whether it be from Native American spirits, or the souls of several people who have drowned in the Lake’s cold waters.

“Ghosts or spirits... no... I’m just never going

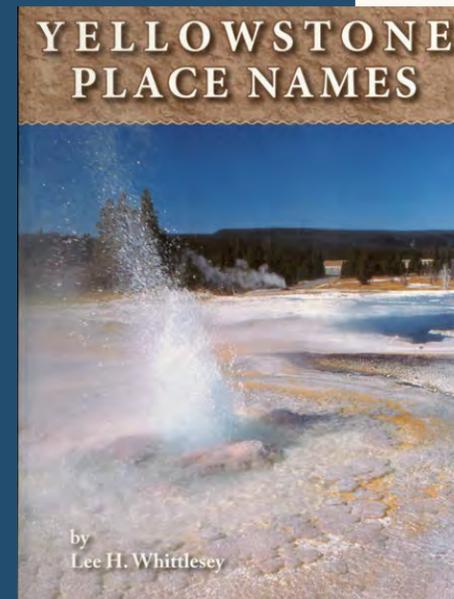
to buy into that,” Whittlesey told the Travel Channel. “But it is spooky... it has a paranormal, preternatural, supernatural element to it. To this day no one has a satisfactory explanation. We just don’t know what causes that ethereal sound.”

The Montana Pioneer Editor’s note: Have you heard the sound? (They say winter is the time it is most likely to be heard.) If you have heard it, please email us at mtpioneer@wispwest.net.

Native Montanan Pat Hill is a freelance writer and music festival enthusiast from Bozeman. Pat is a frequent contributor to The Montana Pioneer and Bozeman Magazine.

*This article was previously published in *The Montana Pioneer*, February 2012.

BOOK REVIEW



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YELLOWSTONE PLACE NAMES

author Lee H. Whittlesey

Countless titles have been published on Yellowstone National Park – road and trail guides, historical efforts, geology works, interpretive manuals etc. Then there is a book that stands apart... *Yellowstone Place Names*. It is rare we review a title that has been out for some time – the second edition of this work was released in 2006. However, while going about our business of teaching, researching and writing about the world’s first national park, we often wonder how a certain name came to be or what it means. The first source for an answer we turn to is this book, hence our decision to review and recommend it.

In winter, we frequently take friends backcountry skiing in northwest Yellowstone’s Bacon Rind Creek... a colorful name that begs to be explained. Whittlesey tells us, “there is no record of who named this creek, but US Army scouts called it Bacon Rind Creek as early as 1898, probably referring to their breakfast around the campfire. A later writer suggests that the name might have referred to baiting bears by hanging bacon rind in the trees, but there is no documentation for either of these propositions.”

How about Fairy Falls, a 197-foot high waterfall, in southwest Yellowstone? Members of the Hayden expedition discovered the falls when standing on top of one of the nearby Twin Buttes in 1871. They named it for “the graceful beauty with which the little stream drops down to a clear descent.”

Although the places are listed in alphabetical order, they are connected to one of several area maps the author has provided, thus making it easier to find a location of interest. And for researchers, an extensive bibliography is included.

Here are some of the words, edited for brevity and clarity, the author used in the foreword, an excellent lead into the book...

“We know distant and famous places first through their names. The name ‘Yellowstone’ is one known around the world by millions who come here and many who have not. During the late 19th century, explorers encountered places virtually without names. They didn’t know what Native Americans called the mountains lakes and geysers of the park, nor do we. The names and the people who used them are gone.” Today, Yellowstone’s history, from the 19th century to recent times, is written across the park maps in names given by trappers, prospectors, explorers and officials.

This book, the first of its kind, will deepen the reader’s appreciation and knowledge of Yellowstone’s past. It shows the history of which we are a part simply by coming to this place. Many of Yellowstone’s names for places or things tie us to an era when the west was the scene of adventure, and wilderness did not have to be sought because it was everywhere.

Whittlesey, the official YNP historian, delivers interesting tidbits and valuable lessons in an easy-to-read manner. For a person traveling through the park, it will be a guide to places along the way, adding meaning that might otherwise be missed. Through Yellowstone’s place names you can come to understand what YNP has meant to generations before us and can mean for many more to come.”

Review by Initiative co-director Rick Graetz

NEW DIRECTOR TAKES HELM OF FLATHEAD LAKE BIOLOGICAL STATION

Six years after the University of Montana was chartered, Morton J. Elrod founded the biological station... it was in 1899. Since then, there have only been seven directors – compared to 18 presidents at the university.

This winter, Jim Elser from Arizona State University stepped in as number seven, replacing the popular and legendary Jack Stanford who spent 44 years at the biological station, the last 36 as its director.

A highly acclaimed scholar who has won numerous awards and has been published in prestigious scientific journals, Elser hopes “to bring a broad interdisciplinary and international vision to the station. Globally, freshwaters are a critically important resource for our very



Jim Elser. Courtesy Flathead Lake Biological Station

survival, and lakes especially are central in providing economic, cultural and social value. This is especially true for Flathead Lake, which is a treasure of Montana and the whole Northwest.

“I want to help make the University of Montana a world leader in advanced research and training in limnology, ecology and environmental science,” Elser said. “FLBS can become a global fulcrum for innovation, discovery and entrepreneurship in those domains, and I am thrilled to join the University of Montana and build a team around that vision.

“Furthermore, we are going to try and get more into the community. We are going to work with regional schools. We are going to be in the high schools trying to get more students involved and get the Flathead presence expanded in the community and in our school systems. So it is going to be great for the young people who grow up around this lake to learn more about what is out there in the lake and how it works and get them excited about science.”

The station now has its first assistant director, Tom Bansak, who has worked at Yellow Bay for 25 years and will be in charge while Elser continues his affiliation with ASU for three months each winter, when work at the Flathead Lake Biological Station typically slows down.

Elser earned his bachelor’s degree in biology from University of Notre Dame, his master’s in ecology from the University of Tennessee and his doctorate in ecology from the University of California, Davis.

ARE WE LOVING OUR NATIONAL PARKS TO DEATH?

Waterton Lakes, Glacier, Yellowstone and Grand Teton have all seen record-breaking visitor numbers... Glacier 2.72 million visitors, Yellowstone and Grand Teton numbers are up and they are still open, and Waterton Lakes had a 15% increase over last year. As more and more tourists in search of a wilderness experience beat a path to the four national parks within the boundaries of the Crown of the Continent and the Greater Yellowstone ecosystems, park managers struggle mightily to contend with visitor safety, visitor experience, and protection of both the natural and man-made resources.

Yellowstone... its sheer size and lack of cell service creates havoc

for the too few rangers who patrol the park. Hours-long waits at entry stations, miles-long bear jams, packed parking lots at favorite features, and few-and-far-between restroom facilities are just a few of the frustrations awaiting tourists. Perhaps, in the future, a reservation system for entry will be necessary.

Trying to reduce the number of cars on the narrow Going-To-The-Sun Road, Glacier implemented in 2007 a shuttle bus system. While the shuttles became wildly popular, they have neither helped the overcrowded parking lots nor relieved traffic congestion. Possible solutions now being considered are expanded parking, more free shuttles, and a timed entry or reservation system.

In Grand Teton, heavy traffic on the exceptional, seven-mile Moose-Wilson road conflicts with the wildlife that inhabit the area. In order to relieve the stress on the animals and to improve the human experience, there are talks on

limiting the number of cars during peak periods and the possibility of bicycle- and pedestrian-only days.

In order to handle the increase in tourism, starting with a new and much-needed visitors’ center, Waterton Lakes is just beginning a five-year, \$107.5 million infrastructure upgrade and replacement endeavor. Improved roads, parking lots, campgrounds, day-use areas, and restrooms will add up to a better experience for visitors.

While the Canadian government is investing in their national parks, US parks are suffering from budget constraints. Clearly, limiting the number of visitors, while solving the present-day problems, will reduce the amount of entry fees collected and therefore affect the much-needed revenue. The overall solutions will be difficult and complex.



NPS



We could use your help...

The Crown of the Continent and the Greater Yellowstone are two of the world's most intact, pristine and dynamic ecosystems. In Canada and throughout Montana, Idaho and Wyoming, on large and small scales, vital work is being done by public and private entities. We are dedicated to bringing you the in-depth research projects, the rich history, personalities (both human and animal), the perils and the victories, inspiring images of special places, and many other elements of these two important and unique landscapes. As UM is a public university, we feel we have an obligation to put into "public speak" what knowledge we gather and to share it with you.

Owing to sparse budgets, in order to continue producing a high quality and valuable publication, keep it on schedule, and get it to you, we are asking for your help.

If you can spare \$10, \$25, \$50 or more to assist us with this work, we would appreciate your generosity immensely! Every donation, regardless of the amount, helps.

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Thanks very much!
The editors—Rick Graetz, Susie Graetz, and Jerry Fetz

CC|GY



CROWN
of the
CONTINENT
and the
GREATER
YELLOWSTONE

MAGAZINE

Ashlyn Sliter, Flathead Lake. Rick and Susie Graetz