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THE NATURE OF DISCONNECT: WILDERNESS IN THE FACE OF CLIMATE CHANGE

By

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Undergraduate Thesis
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for the University Scholar distinction

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ABSTRACT

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The Nature of Disconnect: Wilderness in the Face of Climate Change

Faculty Mentor: Nicky Phear

In the midst of a congressional address on the topic of conservation and restoration, President Lyndon B. Johnson stated, “This generation has altered the composition of the atmosphere on a global scale through . . . a steady increase in carbon dioxide from the burning of fossil fuels.” It was 1965. One year prior, Congress had passed the Wilderness Act of 1964, defining wilderness as “an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.” When the founders of the Wilderness Act wrote these words, they likely had no idea of the repercussions global climate change would bring to these designated areas, even with the issue’s tentative beginnings at the time. They did not understand how an altered atmosphere would threaten the core value of wilderness as untrammelled. Today, half a century later, both these definitions, of climate change and of wilderness, have hardly changed, but the debates surrounding them are vast and heated. Through analysis using existing literature in the fields, I examine the confluence of these two issues, focusing on the history and management of wilderness in the context of anthropogenic climate change. I use this scientific literature along with environmental and philosophical writings and personal experience to help understand the separation society places between wilderness and civilization, reflected in the Wilderness Act, and how that disconnect affects how we approach the issue of climate change.

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The Nature of Disconnect: Wilderness in the Face of Climate Change

I once heard a story of a man who took earplugs into the wilderness. To him, I suppose, each night brought deafening silence; the amble of a moth was the charge of a bear, the sway of the pines was the collapse of his shelter, the howl of a coyote was the siren of civilization. A padded disconnect was the only way for him to sleep.

In the era of globalization and expanding technology, disconnect is not a term thrown around a lot. Anthropogenic climate change forces us to think of the atmosphere as finite and capable of dramatic alterations that have repercussions across the globe. Coal scraped from the earth in Colstrip is burned in China, and its emissions sway currents circling the Antarctic. An ice sheet the size of Rhode Island tumbles into the sea, and the tide rises that much higher in Bangladesh. Climate change is, in its physical manifestation, a thickening blanket of rising concentrations of carbon dioxide and other greenhouse gases over the planet, pumped from burning fossil fuels for energy. But it is also a blanket of influence that covers every mountain range and suburb, every fishing community and grassland. Here in the United States, its weight has settled across the lands we deem most pristine, areas that hold the highest federal protection: wilderness.

This paper is rooted in physical science, but I approach the realities of climate change and wilderness through a medley of rising echoes: history, policy, scientific knowledge, natural history, literature, poetry, and personal experience. I'm going to present wilderness management practices and quote Mary Oliver; I'll critique Bill McKibben and talk about my experiences in wilderness on the same page. Such an approach, I feel, moves away from the separation of

spheres of knowledge surrounding discussions of wilderness and climate change and the two together. If we're going to address anthropogenic climate change, we can't mute the voices we don't want to hear. Original research, nature writing, and personal accounts are distinct spheres of thought and reflection, but their value lies in what content they share. By removing the boundaries we perceive between these different types of knowledge, we can better approach the solutions and perspectives they present.

Society has created a separation of nature and culture that hampers progress in the face of climate change, and the height of this disconnect can be seen in our relationship with wilderness. Inspiration from these wild places seems to stay within its own boundaries, failing to acknowledge the universality of what wilderness can teach us. Through this multifaceted collection of writings, I hope to approach that question, peering closer at the fluid junction of wilderness in the face of climate change.

The History of Wilderness and Its Paradox

“It is true that we have often been careless with our natural bounty,” stated President Lyndon B. Johnson in an address to Congress. “At times we have paid a heavy price for this neglect. But once our people were aroused to the danger, we have acted to preserve our resources for the enrichment of our country and the enjoyment of future generations. The beauty of our land is a natural resource. Its preservation is linked to the inner prosperity of the human spirit” (*Public Papers of the Presidents*). Earlier in this address on “Conservation and Restoration of Natural Beauty,” President Johnson stated that his generation “has altered the composition of the atmosphere on a global scale through . . . a steady increase in carbon dioxide from the burning of fossil fuels” (*Public Papers of the Presidents*). The year was 1965, one year after the passage of

the Wilderness Act. Movements like the creation of a wilderness preservation system focused on protection of the land, but even with President Johnson's mention of a topic that remains contentious in the political sphere today, the recognition that we also needed to protect the atmosphere above was pushed into the background of public notice.

The science of climate change has been known for longer than most people recognize. In the early- to mid- 1800s, scientists Joseph Fourier and John Tyndall proposed that gases like carbon dioxide and water vapor trap heat in the atmosphere much like a greenhouse, and in the early 1900s Svante Arrhenius first proposed the science of human-induced climatic warming through the burning of coal (Frank). But when Howard Zahniser wrote his dozens and dozens of drafts of the Wilderness Act in 1964, I don't know if he was aware, if even at a minimal level, of the broad repercussions of anthropogenic climate change that would affect the landscapes he hoped to preserve. In President Johnson's address mentioned above, the reference to human-caused climate change is in the midst of a call to action on a variety of more localized pollution and environmental issues. While the concern among scientists goes back a century or more, the widespread concern about the issue doesn't seem to pop up until later on.

So when the Wilderness Act passed in 1964, its founders likely had no idea that their definition of wilderness could never be true under the growing threat of climate change. "A wilderness," it reads, "in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain" (Wilderness Act). Through many perspectives, including that of 350.org founder Bill McKibben in his book *The End of Nature*, climate change dominates, trammels, and remains on the landscape. Wilderness is set aside with the assumption that as long as there is no physical human presence there, it will

remain wild, but climate change, caused by human activity, seeps its way into these remote areas through snowless Februaries, floods, and disease.

Climate change brings a jarring shift to the traditional perception of wilderness, but it is not the first change in wilderness' conceptual definition. In Western thought, wilderness can be seen both as the earthly paradise of Eden and also the unforgiving landscapes to which Adam and Eve were expelled. William Cronon's essay "The Trouble with Wilderness; or, Getting Back to the Wrong Nature" documents the progression of wilderness to a place of sublime inspiration, an untouched frontier, a paradise. For those like Henry David Thoreau, William Wordsworth, and John Muir, wilderness was the physical manifestation of the divine, a place to seek God. "Although God might, of course, choose to show Himself anywhere," Cronon writes, "He would most often be found in those vast, powerful landscapes where one could not help feeling insignificant and being reminded of one's own mortality. Where were these sublime places? God was on the mountaintop, in the chasm, in the waterfall, in the thundercloud, in the rainbow, in the sunset" (10). In the later part of the 19th century, wilderness was seen as a place of divine inspiration, and this notion of wilderness also changed as the United States expanded westward. The Lewis and Clark expedition and Manifest Destiny projected a viewpoint of the West as wild and unconquered, and also rich in resources. Wilderness, once a place to seek the divine, now emblemized the American spirit in the form of freedom, independence, and rugged individualism.

Like climate change today, each gradual shift in the definition of wilderness was spurred by some sort of societal shift or crisis. The resource extraction following the mindset of Manifest Destiny left mine tailings poisoning rivers and whole forests leveled for their timber, prompting the drive for conservation. Those such as John Muir, Gifford Pinchot, and Aldo Leopold fought

to protect lands that were still untouched, pioneering the wilderness preservation movement forward to Howard Zahniser and the other authors of the Wilderness Act. President Johnson's address in 1965 reflects the realization of the damages inflicted upon "our natural bounty" and "the beauty of our land," and today, that same urgency has resurfaced as even our most protected areas face the damages of a changing climate (*Public Papers of the Presidents*).

The perception of wilderness has changed through the centuries, but many would argue that the most dramatic change is spurred by anthropogenic climate change. Rising levels of greenhouse gases in the atmosphere come from human sources, but their effects extend into the natural world as well, shining a light on the reinforced separation of nature and culture. "I wish to begin a word for Nature," opens Henry David Thoreau in his essay "Walking," "for absolute freedom and wildness, as contrasted with a freedom and culture merely civil" (71). This is the widespread idea that civilization, despite its strength and abundance, is the source of human ills, and that we desperately need an escape from it. So we escape to the mountains, to the rivers, to the trout-filled lakes—to wilderness. On a fundamental level, it is the subconscious but wrenching separation of nature and culture and human and non-human. Wilderness, in both collective thought and by definition in the Wilderness Act, is the opposite of civilization. It is presented first and foremost as what it is not; it is not part of "those areas where man and his own works dominate the landscape" (Wilderness Act). Here lies the paradox of wilderness. Wilderness only exists as an opposite to civilization, which created it in the first place. We want wilderness as an escape from the human world, but, according to Cronon, wilderness is in fact a product of that civilization.

Understanding this "dualistic vision in which the human is entirely outside the natural" is complex in its own right (Cronon 17). It raises questions both about wilderness and civilization

across the globe; it makes me reconsider the rapture I experience sitting in the middle of a wilderness watching the solstice sun set. But then comes the inevitable, the topic that has worked its way into every natural science and policy class I have taken, that nowadays lurches behind discussion of the Keystone XL pipeline, streamflow for anglers, fire management, East Coast blizzards and West Coast droughts, and state and individual rights. The abstract definition of wilderness, engrained in our minds and written in law, may be a product of civilization, but so are the rising tidewaters of a changing climate.

The Physical Junction of Wilderness and Climate Change

For the most part, wilderness in the United States is defined, seen, and maintained as a place free from intentional human impacts. Section 4(c) of the Wilderness Act lists human activities prohibited in federally-designated wilderness; this Prohibition of Certain Uses states that “there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and . . . there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area” (Wilderness Act). Of course, there are grandfather clauses and other provisions for exceptions, such as the Schafer Meadows airstrip in the middle of the Bob Marshall Wilderness Complex or the maintained earthen dams and associated equipment in the Rattlesnake Wilderness. The Act reinforces the idea that “man himself is a visitor who does not remain” (Wilderness Act).

These 4(c) uses prevent erosion from roads, pollution from machinery, and disruption from building structures. Such impacts are harmful to the local environment; they are products of humans remaining on the land, rather than passing through as visitors. But they are also the

activities we use to define civilization: transportation, shelter, development, organization. They further divide the difference between wilderness and civilization, and they expand on the paradoxical definition of wilderness by stating that wilderness cannot exist without a human development to contrast itself against. So what happens, then, when human activities, which we previously thought could be confined to specific areas, are impacting wilderness from afar? Suddenly does it matter how restrictive wilderness rangers are to newly-created campsites on a lakeshore or the prohibition of chainsaws in designated areas? The concentration of carbon dioxide and other greenhouse gases in the atmosphere is altering ecosystems and climates at a local level. Giant sequoias in Yosemite National Park are drying out and dying. Pikas in the Anaconda-Pintler Wilderness are climbing higher and higher to escape the rising summer heat. Joshua Tree National Park may no longer boast Joshua trees, and Glacier National Park may soon take its name only from the dramatic history of ice on its landscape, not from the actual presence of glaciers. More broadly, the junction of the two issues presents a difficult question: what the importance and relevance of wilderness in the scope of global climate change?

For those who work with wildernesses, namely the Forest Service, National Park Service, Bureau of Land Management, and Fish and Wildlife Service, approaching an answer to the question of climate change in wilderness begins with a weighted answer: management. Such a term in any context of wilderness is heavily debated, ranging from wolves and other predators to the ‘let it burn’ policy for wildfires. Adding the effects of climate change into the mix only “exacerbates these and other stewardship challenges” (Nelson 10). In her thesis “Responses to Climate Change in National Park Service Wilderness: What Is Happening in the Field?” Katherine Nelson outlines the two main venues of thought for climate change management in wilderness: active versus hands-off.

Leaning towards active management in wilderness follows the notion that the presence of anthropogenic effects on wilderness calls for active, hands-on management on the landscape (Nelson 14). As discussed earlier, the authors of the Wilderness Act couldn't foresee the impacts of climate change in these areas, so the implementation of 4(c) uses is justified (Nelson 52). This means watering giant sequoias in California where drought has been killing the ancient trees. White pine blister rust is spreading into high-elevation whitebark pine forests; active management means stretching nets over the pines, shielding the cones from dispersers like Clark's nutcrackers or squirrels, in order to later harvest the seeds and test them in a lab for resistance to the disease before replanting the chosen seedlings. Active management might mean reconsidering the 'let it burn' policy and sending crews into wilderness with helicopters and chainsaws because, under normal circumstances, the forest would not be so dry and burn so hot and sterilizing. It forces decisions based on characteristics and species especially in wilderness, and not necessarily wilderness as a whole.

On the other hand, wilderness qualities of untrammeled and natural seem to argue that wilderness should be left alone, no matter what changes we are observing there. Even though the Wilderness Act is written in a way that excludes most permanent human activity, "Zahniser apparently sought to avoid excluding lands from wilderness designation that could not qualify as perfectly pristine and absolutely free from human intervention" (Nelson 18-19; Friskies 2008; Scott 2004). That is to say, designated wilderness, especially in the eastern United States, can still be wilderness even if it has seen human activities and impacts in the past, as long as it is allowed to go about its natural processes untrammeled. It's not the baseline that matters, but rather the ability of the landscape to recover and function outside of human influences. Under this hands-off train of thought, anthropogenic climate change falls into the same sphere as

“historically manipulated landscapes” (Nelson 19; Scott 2004). Even with this base level of human activities, ecosystems within wilderness landscapes should be allowed to function without intervention by intentional management. Wildfires burn, wolverines struggle to find territories, and lodgepole pines must fight infestations of pine bark beetles without human-induced thinning or spraying. This process of stepping back and simply observing speaks to humility; we watch wilderness ecosystems struggle and even collapse with the understanding that, however indirectly, we are the cause of such loss.

On simple terms, the difference between active and hands-off management comes down to something of a math equation. The problem is human caused, so where does the human aspect fit into the solution? Active management takes the human-caused consequences, such as the extinction of a low-elevation species, and addresses it with further human actions, such as assisted colonization of transplanting said species into higher, previously uninhabited elevations. It is, essentially, human action plus human action; the negative impacts of anthropogenic activities negated by positive ones. The conclusion is a return to zero, of what we would consider natural in wilderness. For hands-off management, the solution comes from just the opposite, by subtracting human activities from a system already altered by human presence. It assumes anthropogenic action in wilderness is negative no matter its intention. Replanting whitebark pine seedlings that are more disease-resistant still undermines the processes that run that ecosystem. In this equation, a negative minus a negative amounts to zero.

Of course, none of this is simple. Separating management into two distinct methods hardly captures the complexity facing wilderness and park rangers every day as they address climate change in wilderness areas. And while organizing these two methods into simple equations helps convey their reasonings, the fact remains that no equation can describe the

weather patterns, disturbance regimes, decay, growth, evolution, and interconnectivity of a single plot of land in wilderness or any landscape. These two equations fall apart past the basic conceptual level because they assume that the human variable is a constant, that warmer, rainier winters caused by an increase of greenhouse gasses in the atmosphere can be simply counteracted by fuel reduction in fire-prone forests. And as Nelson brings up in her thesis, no one wilderness area is created equal. Climate change means warmer average temperatures for much of the West, but how that affects characteristics of Yosemite National Park and Glacier National Park varies greatly. Rangers can haul water for thirsty giant sequoias in Yosemite, but rangers in Glacier can do nothing to stop the calving and melting away of glaciers. Management in wilderness is a slippery slope to begin with, and climate change only drizzles rain atop that slick ice.

Navigating Abstractions

A map of the Wilderness Preservation System hangs above my kitchen table, pocketed with green, orange, purple, and yellow areas defining what agency manages certain wilderness areas and where their borders begin and end. Humans love definitions. We love to organize, to place boxes around things, to categorize and label. We make lists, we sort laundry, we filter ideas into bolded subheadings. We have committees and subcommittees that debate the specificity of definitions and language in our legislation.

At the beginning of a traverse of the Bob Marshall Wilderness Complex two summers ago, my trek group stopped at the wilderness boundary marker, the classic lopsided, wooden sign labeling what wilderness we were about to step into. From the trailhead, we had been following

the West Fork of the Teton River for a couple miles before pausing at the sign. A wildfire had burned through the area about a decade ago, leaving the pines standing white and branchless. Fireweed and cinquefoil grew in thick, colorful patches beneath the snags, and red-limbed willows crowded the stream banks. The landscape was mostly quiet save for the occasional chirp of a downy or hairy woodpecker clinging to the slick sides of a burnt lodgepole. Standing still on the trail, we saw that there was no difference between the forest to the west of the wilderness boundary sign and to the east. There was no wire fence or change in physical landscape, only a lone wooden sign and a dusty trail.

Wilderness, as Cronon states, is an abstract concept buried deep in cultural consciousness. Wilderness is the pristine lands of the New World, the rich Western Frontier, the rapture that *Backpacker Magazine* promises of Turquoise Lake in the Missions. Wilderness is the allure of the tundra above the Arctic Circle, where caribou forge swollen rivers and wolves lope nearby. It is the woods behind Walden Pond, the open beauty of the Southwest in *Desert Solitaire*. Wilderness lives in poetry, from William Wordsworth to Mary Oliver.

What we hear and read and write about wilderness creates an abstract definition, a series of boxes and labels in our mind. The point I think Cronon is trying to get at in “The Trouble with Wilderness” is that the separation between our conceptions of wilderness and its physical reality has become stretched and distant, that from those who live in the concrete expanse of New York City to those who recreate in wilderness regularly, our perceptions and our reality of wild places are a tumbling, off-kilter mess. We go into wilderness expecting pristine, untouched land, and we are disappointed when we see the rusty remains of an old miner’s cabin or a squad of Conservation Corps members spraying a meadow of spotted knapweed. Wilderness, against the

constant reminder of global climate change, mass species extinction, mass-production agriculture, and environmental injustice, has become a simple ideal, not a complex reality.

The topic of anthropogenic climate change, too, carries this separation of abstract and concrete reality, though in an opposite sense. I would argue that we have such a difficult time grasping the concept of climate change because it is so enormously complex and intangible. Even its basic science, the burning of fossil fuels increasing the concentration of carbon dioxide and other greenhouse gases in the atmosphere, is invisible to most of our senses. We can't see or smell or taste carbon dioxide in the air; we can't perceive the heaviness of its rising concentration. Climate change's impacts, from heat waves to disease to species die-off, are strikingly concrete, but one storm surge or bark beetle outbreak is nearly impossible to contribute entirely to climate change. It would be so much easier to attribute Hurricane Katrina to anthropogenic climate change as a whole, or say that the warm, sunny winter drying out much of the West this year is a direct result. But the science states again and again that we can't. It is, after all, about *change*. We can physically perceive the points on a graph, but not their rising trend. Another term, global warming, illustrates the same: a focus on the progression, the *-ing* of the issue. The concept of a carbon footprint comes up frequently in discussions of fossil fuel consumption and carbon dioxide pollution, but the exact mark of that footprint is difficult to find.

Perhaps that points to what is so satisfying about wilderness. The map above my kitchen table sweeps clean lines and bright colors across lakes and mountains and plains. When we designate wilderness, it feels rewarding to many because it sets aside a chunk of land away from logging, snowmobilers, and the sprawling wildland urban interface. Its coordinates go up on a map; signposts are pounded into the earth to mark its boundaries. We let out a small sigh. For some, it is a sigh of relief because the land is preserved and protected for us and future

generations, while for others it is a sigh between gritted teeth because the land is fenced off except to enlightened hikers and determined hunters. But whichever perspective, it is a sigh of finality, an assumption that once wilderness is signed into law, it will not change. We can brush our hands and move on.

Where climate change and wilderness intersect, a muddled torrent of multifaceted definitions and complexity, many see a clash of opposites, a polarity of wild and free against the taint of carbon on our hands. Climate change reigns down its epidemics and drought and winter rains across the static purity of wilderness. We love opposition as much as we love labeling. Congress is an infuriating bickering of Democrats and Republicans, and even for the two Independents in the Senate, everyone wants to know which way they lean. You are one or the other. In Montana, the debate over wolves separates people into tree-huggers or heartless killers. I don't know where to raise my voice because I have studied large predators' place in these ecosystems, but I spent my childhood summers helping my grandpa raise and work cattle, and I understand the deep-rooted importance of that livelihood.

Division is conceptual; I learned that standing on the rim of the Bob Marshall Wilderness that sunny morning. Black and white. Nature and culture. Wilderness and civilization. If you gave me a map I could tap my finger on that marker, but send me into the field and I am only turning in a slow circle, searching for division. The bright growth of the fireweed speaks of change. I think we should stop at boundaries more often.

Blending Binaries

“Our comforting sense of the permanence of our natural world, our confidence that it will change gradually and imperceptibly if at all, is, then, the result of a subtly warped perspective,”

writes Bill McKibben. “Changes that can affect us can happen in our lifetime in our world—not just changes like wars but bigger and more sweeping events. I believe that without recognizing it we have already stepped over the threshold of such a change: that we are at the end of nature” (7).

McKibben’s *The End of Nature*, first published in 1989, is a call to arms against global warming, ozone depletion, and acid rain. Often cited alongside Rachel Carson’s *Silent Spring*, it was one of the first major pieces of environmental literature to present the doomsday facts of anthropogenic climate change, at a time when the world’s carbon dioxide concentration was around 350 parts per million (ppm) (that figure stands around 400 ppm today in 2015). McKibben presents a stark and controversial argument that the human perception of nature, our collective definition, has ended, that global environmental degradation means that there is no pristine creek or arctic ice sheet that has not been altered and tainted by human presence.

When McKibben says, “the end of nature,” he is not referring to the demise of the natural world as a whole, much as many of his books’ covers would suggest: the earth wrapped in flames, a dead warbler on a bed of ferns, a billboard of a verdant forest erected in front of a desolate, blank landscape. Instead, he is referring to “a certain set of human ideas about the world and our place in it” (7). Much like Cronon’s essay, which finds fault in the abstract definition of wilderness in the American mindset, McKibben states that our understanding of nature, the ideal image in our mind, has faded away. The “death of those ideas begins with concrete changes in the reality around us—changes that scientists can measure and enumerate,” he continues (7). McKibben is pointing towards the junction of concrete and abstract and of nature and human culture. But he sees an opposition, a series of heavy divisions between the human and non-human world. McKibben is arguing, like we all should, for a dramatic shift in

society, a change in “industrial civilization,” to address anthropogenic climate change (158). But as he does that, shocking us with the realities of a changing planet, exploring trains of thought such as the Gaia hypothesis or deep ecology, I think he is suggesting, perhaps unintentionally, another more sweeping change. If climate change has seeped across the planet and ended our idea of nature, maybe it’s time for a new relationship with nature.

When I was young, I devoured books by Gary Paulson and Jack London. I drank in the maps and photos of *National Geographic* and absorbed myself in David Attenborough’s wildlife specials. Lewis and Clark and Sacajawea dominated my primary education; we followed the routes they took across the lands that I hiked and through the rivers where I swam. To these people, real or fictional, wilderness is both immensely beautiful and immensely harsh. It is the antithesis of stability. It is volatile and unforgiving, jabbing prickly pear spines into bleeding feet above the Missouri River, draining heat and movement from fingers in the thick of the Yukon. I learned from an early age the binary nature of wilderness and civilization and nature and culture.

But then something shifted. I couldn’t say exactly when, but it progressed somewhere in the midst of my four years of college, as I traveled from Yellowstone to Finnish Lapland and from the Great Burn to Spain’s Sierra Nevada. I learned about disturbance regimes and traditional ecological knowledge, about livelihoods on the rim of and in the middle of wilderness. I climbed the yellow face of Mount Sentinel and ran with herds of whitetail and mule deer, voles and mice, grouse and meadowlarks, foxes and coyotes. I strolled along the river and watched osprey, bald eagles, hawks, kingfishers, and great blue herons hunt in the waters of the Clark Fork. Downtown Missoula stood on the opposite side, and above it Stuart Peak of the Rattlesnake Wilderness peered down from snow-brushed shoulders. This is wild, I thought. I didn’t see opposition here, only a connected existence.

I don't have a specific moment of epiphany that slid away the black and white filter in my mind. But somewhere deep down, I think there is a source of the change, a forced turning of perspective, and that is climate change. The roar of observations about melting glaciers and mass extinction and rising tides swallowed me whole, and I was ashamed to be human. I wanted to escape the trains snaking along the Blackfoot River with their cargo of coal. I wanted to run away from the heaps of plastic I created every day, from the news of empty promises and ignorance in my country. I wanted to flee from this churning compilation we call civilization and into the leafy arms of an untouched wilderness. But I couldn't, because climate change is there too.

"We have killed off nature," McGibben writes, "—that world entirely independent of us which was here before we arrived and which encircled and supported our human society" (82). He is presenting a binary of nature and culture that I don't support, that I have seen broken again and again in wilderness. When asked what was the most memorable experience she'd had in wilderness, a University of Montana grad told me and a group of students about a backpacking trip where, far from the roar of highways or whine of sirens, she and her group members had watched a plane, high above in the sky, make a complete u-turn. It was early September of 2001. On the windy splendor of the Rocky Mountain Front, I listened to a Blackfeet woman speak with knowledge of the area around Glacier National Park that came not only from a lifetime of study, but also from generations of teachings from her ancestors and the land itself. Hunters pick their way over the ridges of the Welcome Creek Wilderness, stalking a buck that will become burgers and jerky and stew for a family that winter. Wilderness, like nature, has never been an independent entity of us. What William Clark, David James Duncan, Norman Maclean, Annie Dillard, and anyone who has experienced wilderness, designated or no, share is a feeling of their

comforts stripped away, an immense sense of vulnerability in a place of beauty and complexity beyond our conceptions. When I run the intermountain prairies, when I ride on horseback into the thick forest of the Missions, when I begin the morning with a breakfast of whortleberries in the Beartooths, when I paddle beneath the white cliffs of the Missouri River Breaks, when I watch three grown grizzlies amble across the mountainside in Glacier National Park—this is when I feel most human. I am not apart from nature, but a part of it.

However harshly, climate change reminds us of our place in the scope of the world. It reminds us that the clear air we breath in wilderness is still thicker with carbon dioxide that we have expelled in a pursuit for immediate and material gain. It forces us to tear down the division we have built between wilderness and civilization; it forces us to see that while we have always been a part of the natural world, it is our relationships that have changed. A few years ago I hiked around Glacier with a friend, and we each waded into the biting blue water of Grinnell Lake to reach a slap of glacier bobbing near the shore, to say that we had touched one of Glacier's frozen memories before they all melted away. Standing with my palm against that smooth surface, I was overwhelmed by the reality of this fact: most models predict the park's glaciers will be gone by 2030. How could I speak of the beauty of the Angel's Wing and the blooming beargrass, of the thimbleberry bushes picked clean by grizzlies and the marmots sunbathing without a care on the rocks, without too thinking of this moment of loss?

Wilderness in the face of climate change puts forth this question. It asks us how we're going to step forward, or if we're going to at all. It questions our humanity; it wonders if we will turn away with bitter shame. It raises its voice like the call of a pika from the stones of a talus slope, clear and sharp, unanswered in the warmth of sunrise.

A Question of Gratitude

An answer came to me three days before the spring equinox, when, after days of wind and rain, sunrise revealed a clear and azure sky. I climbed up Mount Sentinel, where the buttercups were blooming and currant brambles were starting to bud. The songbirds were joyous, and I felt as if I were back in Geneva or Helsinki, awash in jubilant languages I did not understand. Western meadowlarks warbled from the tumbleweed, their breasts beginning to turn yellow. The clouds had dissipated during the night, leaving the morning with splints of ice where there had been soft mud the day before. My breath condensed as I pushed up the slope. I wasn't wearing much: a pair of shorts, a pullover, a headband tied behind my hair. It felt good to run, but it was also necessary to keep the blood pumping hot to my hands and feet.

Wilderness strips us down to our basic necessities, to food and water and shelter and warmth. To dwell there, we have to consider every ounce in our pack, because in the true practice of leave no trace, we take out everything we bring in. A raincoat, a solid pair of boots, a stove with a slim metal pot and just enough fuel. Nutrient dense food, preferably plenty of chocolate. Enough water to get to the next stream crossing, and a water pump to filter away giardia. A tent and fly to guard against midnight thunderstorms and swarms of mosquitoes. And a pack to hold it all, one with good straps that even out the burden across the collarbones and hips.

Wilderness reminds us of being human, and it also reminds us of gratitude and humility. In wild country, I am thankful for the down feathers of my coat when the evenings grow chilly and for the high mountain lakes when the day is hot and my skin sticky. I am grateful for the smear of insect repellent that keeps deer flies and chiggers and mosquitoes at bay. Every huckleberry and wild strawberry is a tiny exuberance of sweetness and awe. I would freeze at

night without my sleeping bag; the known contours of my boots keep my feet from degrading into bloody soles. There is the aspirin pill, derived from strips of willow bark, that chases away my dehydration-fueled headache. When the summer isn't too dry, I'm grateful for the dry branches for campfires, which are the centers of stories and songs. And the return to civilization shines a new light on the luxury of paved roads and running, potable water.

In wilderness, we are forced to understand the difference between necessity and want. The greatest meal I've ever eaten was quinoa macaroni with powdered and hard cheeses that had jostled in packs for over a week, enhanced with freeze-dried veggies. It was not enjoyed on the cobblestone streets of Rome or the within the elegant sophistication of London, but on the banks of the Spotted Bear River in growing darkness. I have never been so wholly satisfied as in those moments of chewing sporkfuls of backcountry macaroni and cheese; I was eating for the proteins and carbohydrates and nutrients my body needed from carrying the necessities of my life through the wilderness. It is humbling to feel hunger deep in your bones, not just by the turn of the clock.

Like most things, I didn't stumble across this idea of gratitude in the natural world myself. It has threaded through my life, taught by my parents and teachers, flaring up in my favorite books and films and poetry, reflected upon by my grandpa as we wandered on horseback among herds of black angus or through dense forests of snowberries, red-cedar, and Douglas fir. But much of this understanding fell into place in the book *Braiding Sweetgrass* by Robin Wall Kimmerer. A member of the Citizen Potawatomi Nation, Kimmerer speaks of the world in a braiding of indigenous, scientific, and spiritual knowledge in a way I had never heard, and a thread that runs strong through her book is the notion of gratitude.

"In consumer society, contentment is a radical proposition," Kimmerer writes. "Recognizing abundance rather than scarcity undermines an economy that thrives by creating

unmet desires. Gratitude cultivates an ethic of fullness, but the economy needs emptiness. . . . Gratitude doesn't send you out shopping to find satisfaction; it comes as a gift rather than a commodity, subverting the foundation of the whole economy" (111). Seeing the material world in terms of gifts is, Kimmerer puts it, "a revolutionary idea" (111). But it is a mindset we take on each time we go into wilderness; that is its draw. There is so much beauty and interconnectivity that all we can feel is awe and gratitude. But for a reason cemented through history, we are told to leave such inspiration there. The divide of wilderness and civilization is not physical, but powerfully abstract; it tells us that such mentalities of wildness and culture should stay in their own spheres. *Why should it?* I wonder as I stare across the Helena Valley to the Sleeping Giant to the north, as bluebirds sing from the sagebrush and a mother fox prowls below. *Why should it?* Kimmerer asks as she explores the relationships Native Americans have had with the land for centuries. And wilderness seems to pose the same question to us as it faces a rapidly changing climate, one we have caused.

To borrow Cronon's phrase, I believe that this is the trouble with wilderness. We pack out our tents and stoves, our sacks of weed-seed-free feed for the stock, our wrung-out tea bags and strips of plastic wrappers, but we leave behind gratitude and wonder. We leave behind what some would call the principles of sustainability, of necessity and not want, of a closeness with the land, of a understanding of our impact on that land. "As a culture, though, we seem unable to extend these good manners to the natural world," Kimmerer states. "The dishonorable harvest has become a way of life – we take what doesn't belong to us and destroy it beyond repair: Onondaga Lake, the Alberta tar sands, the rainforests of Malaysia, the list is endless" (185). I wonder how differently we would live our lives if we personally had to carry the weight of our consumption and waste. Would we need a new smartphone every year if we had to shoulder the

burden of its production on our own backs and not those of people and ecosystems half-way across the globe? Would we see the inefficiency of drying our clothes in a bulky machine when the wind ruffles the lilac bushes outside and the sunshine fuels their growth, and then extend that thinking to the inefficiency of finite energy from fossil fuels? What if we lived each day like we were backpacking, packing it in and packing it out?

To return to the simplicity of a math equation, I believe that the nugget of the problem of anthropogenic climate change is that of imbalance. Imbalance in resources, in wealth, in burdens. For much of the United States, there is an absence of gratitude for our everyday things. That's a disconnect harmful to the majority of those on the planet who don't live like us but aspire to do so, harmful to the planet we label as apart, and fundamentally harmful to ourselves. If we see nature as an entity separate from ourselves, it is so easy to ignore the consequences. But at the same time, if we understand our place in this mess, the shame can wash away any will to go forward. So we need to be grateful. But a mentality of gratitude, Kimmerer says, is not one of comparison or contrast. That breeds cynicism, the lack of hope that I read in books like *The End of Nature* and *The Barbaric Heart*, despite the profound ideas both works propose. Being pessimistic shrouds any glimpse of progress; the glass will always get emptier. *Braiding Sweetgrass* seems to argue that it doesn't matter how much water is in the glass, but rather that there is water there at all.

"Despair is paralysis," Kimmerer writes. "It blinds us to our own power and the power of the earth. Environmental despair is a poison every bit as destructive as the methylated mercury in the bottom of Onondaga Lake" (328). Paralysis points to despondency, and despondency points to passivity. A 2012 neurological study of empathy in the brain found that lack of empathy among different groups of people has less to do with goodwill or animosity, but rather with

relevancy and direct connection, good or bad. MIT cognitive neuroscientist Emile Bruneau found that “[as] far as the brain is concerned, . . . the opposite of love might not be hate but indifference” (Interlandi). In the context of global climate change, this means that passivity and apathy, whether from environmental despair or its overwhelming abstract perception, may prove more harmful than fossil fuel lobbying groups or deniers of the science. And that disconnect is only further widened by our cultural understanding of nature as separate, of wilderness as a place of contemplation that remains within its boundaries. Kimmerer speaks of the teaching of plants, and so I extend that to the teaching of wilderness; we are grateful and humbled by these quiet places, by what we bring and what we take. Nowhere is it written, not even in the Wilderness Act, that such a mentality should stay there.

Stepping Forward

Last summer, my dad and I went to a celebration at Seeley Lake to commemorate the 50th anniversary of the Wilderness Act. There was a raffle for gear and sponsored trips, a local brewery serving the special Bodacious Bob brew, and a happy jumble of people and dogs spread across the cool grass. The Mission Mountain Wood Band took to the stage, drawing crowds of barefoot dancers. As the sun set over the lake, bats came out, swooping with breathtaking agility through the surrounding ponderosa pines and over onlookers’ heads. The blare of the banjo from the stage didn’t seem to bother them.

Half a century had passed since Howard Zahniser drafted the Wilderness Act, since Congress passed it and President Johnson signed it into law. That evening the mentality was that of celebration, but in the sphere of wilderness today the question on everyone’s mind is what the next fifty years will bring. Not only do we better understand anthropogenic climate change, but

we also understand its impact on lands the Act labeled as designated wilderness. Fifty years ago, the language of the Act focused on wilderness as untrammeled, letting the ecosystems run their course without human influences. “If untrammeled was meant to refer to an absence of intentional human influences,” wonder Nathan L. Stephenson of the US Geological Survey and Constance I. Millar of the USDA Forest Service, “what are we to make of pervasive unintentional human influences, like anthropogenic climatic change?” (Stephenson and Millar 2). The Act has come face to face with a reality that even its carefully crafted language is not timeless. We can no longer draw boundaries around an area and move on. Climate change seems to argue that our work is not done, and what constitutes that work is highly debated.

The next morning my dad and I got up early and hiked into the Mission Mountain Wilderness, a range my dad knew east to west and north to south. It was late summer, and the grizzlies had picked the thimbleberry and huckleberry bushes mostly bare and moved on. We stopped at outcrops to stare over the Glacier Creek drainage, and across the valley the Swan Range ran parallel to the Missions. We reached our destination, Turquoise Lake, by mid-afternoon, and wandered across the shoreline, littered with driftwood, pausing to gather fat huckleberries that crowded against the beargrass. On the eastern edge of the lake was a wide scree slope; at its base sat a verdant meadow of grasses and asters, littered with sharp boulders. We climbed up on one stone’s flat face, and after a few minutes that telltale squeak echoed across the rocks: there were pikas foraging in the wildflowers. One had scampered into a hollow below our boulder, where it likely had a good quality of hay stored for the winter, but it was fearful to dart out again with our shadows casted from above. I lay down on my stomach and leaned over the rock’s edge, and the pika tilted its head up at me, inquisitive eyes and round, heat-regulating ears intent on my movement. It was the closest I’d come to this rodent of the high

country, this polar bear of the Rockies. If I had stretched out my arm, my fingers could have come within a few feet of the pika, almost close enough to touch the soft bulk of its fur. But, of course, I didn't.

Pikas, like the glaciers, cannot be saved. They require high, cool environments where they will not overheat. The summers here are getting warmer, and so are the pikas. They are running out of mountain. This is the harsh reality facing those who work in wilderness areas; even in the midst of the debate surrounding active versus hands-off management, there are still species and features that cannot be saved, no matter their efforts. Management in wilderness to address the impacts of climate change presents itself, simply, like a black and white discussion. It's so much easier that way, because the complexity of the issue leaves a hollow and unanswered taste in the mouth, a slippery slope of how we define what is wild and natural. But there is no single answer to addressing management in wilderness, just like there's no single answer to solving human-caused climate change. If only it was as easy as stretching my fingers that much farther, delicately lifting the pika out of its fear, cradling it in the promise of a stable future. But I can't.

The answer I stumbled upon while running that early spring morning, of what wilderness can teach us about living sustainably, is not a single solution. Being grateful and humble to the natural world, I think, is a fundamental base if we're going to tackle the injustices we've inflicted on the planet and its people in the name of ceaseless consumption. We still need policies and litigation and their associated sacrifices. We need literature, poetry, essays, music, and film that construct a narrative not only of where we've been, but also where we're going. We need research that digs deep to the initial question of science: why? Tackling climate change, for the sake of wilderness and people of the Maldives and the whitebark pine, means a sweeping shift in

individual perception that weaves beneath changes in how our civilization props itself up. It is not strictly concrete or strictly abstract, but a medley of both and something in between. It is as complicated as wild ecosystems and the origins of climate change itself.

In her poem “Terns,” Mary Oliver writes:

The years to come—this is a promise—
will grant you ample time

to try the difficult steps in the empire of thought
where you seek for the shining proofs you think you must have.

But nothing you ever understand will be sweeter, or more binding,
than this deepest affinity between your eyes and the world.

(Oliver 34)

This is the base of such a complex shift, one held in the cusp of wilderness. Humility in the face of what we deem wild and free cannot stay there. Gratitude for the wild strawberry and the rain fly and the box of matches is not endemic to wilderness. “This deepest affinity” is not curtailed to Patagonia or the Himalayas or the Bob Marshall; it is not isolated to those places isolated of people. It is simply the world, an affinity to the fisherman in India, to the miner in Appalachia, to the caribou of the Arctic and the ice shelves of the Antarctic, to the child in Somalia and the wolverine kit in Alberta, to the rain forests of the Amazon and the corals of the Great Barrier Reef, to the pika in the Missions. In the face of climate change, all beings become refugees, Kimmerer writes, from farmers in Bangladesh to the maples of the Northeast (173). Indifference and separation are as powerful as typhoon winds and withering heat waves. Discussions of climate change and wilderness need to expand the connections between different types of knowledge, seeing the importance of nature writing, literature, philosophy, neurology, personal experience, and more. If we leave the inspiration of wilderness within its invisible boundaries, we extend that same separation to people and places elsewhere on the globe, a monumental fault

in the era of climate change. And if we cling to the hope, for better or for worse, that wilderness will never change, then neither will we.

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