

THESIS

RAPID ASCENT: ROCKY MOUNTAIN NATIONAL PARK IN THE GREAT  
ACCELERATION, 1945-PRESENT

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## ABSTRACT

### RAPID ASCENT: ROCKY MOUNTAIN NATIONAL PARK IN THE GREAT ACCELERATION, 1945-PRESENT

After the Second World War's conclusion, Rocky Mountain National Park (RMNP) experienced a massive rise in visitation. Mobilized by an affluent economy and a growing, auto-centric infrastructure, Americans rushed to RMNP in droves, setting off new concerns over the need for infrastructure improvements in the park. National parks across the country experienced similar explosions in visitation, inspiring utilities- and road-building campaigns throughout the park units administered by the National Park Service. The quasi-urbanization of parks like RMNP implicated the United States' public lands in a process of global change, whereby wartime technologies, cheap fossil fuels, and a culture of techno-optimism—epitomized by the Mission 66 development program—helped foster a “Great Acceleration” of human alterations of Earth's natural systems. This transformation culminated in worldwide turns toward mass-urbanization, industrial agriculture, and globalized markets. The Great Acceleration, part of the Anthropocene—a new geologic epoch we have likely entered, which proposes that humans have become a force of geologic change—is used as a conceptual tool for understanding the connections between local and global changes which shaped the park after World War II. The Great Acceleration and its array of novel technologies and hydrocarbon-powered infrastructures produced specific cultures of tourism and management techniques within RMNP. After World War II, the park increasingly became the product and distillation of a fossil fuel-dependent society.

## ACKNOWLEDGEMENTS

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guided me and others through various bureaucratic mazes. Their work is more essential than anyone's, and they deserve to be recognized for it.

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Finally, I have to thank my parents, Bob and Marta, for setting the foundation that this thesis is built upon. My parents taught my brother and me to think for ourselves, to work hard, and to act on our own ambitions. They taught me how to read, the most important skill for any historian to master. And whether they realized it at the time or not, both of my parents instilled in me a politics centered upon human dignity, fairness, and thoughtfulness, all attributes that I covet and that I hope will always be present in my writing, both here and in my work to come. Studying history at Colorado State has helped me tap into those ideas and convictions at a deeper level. But Bob and Marta laid the bedrock and have continued to do so for nearly a quarter-century. For that I'm eternally grateful.

DEDICATION

*To Grandpa Boxell*

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## Introduction

“Welcome to the Anthropocene.” From the *Economist* to *Bloomberg*, various publications have, over the last several years, heralded this new epoch in the Earth’s natural history. What exactly it is that we as a species are welcoming is simple enough. First proposed by Paul Crutzen and Eugene Stoermer in 2000, the concept of the Anthropocene describes a new epoch in the planet’s geological history, a period in which humans have altered the Earth’s natural systems in ways stratigraphically and functionally distinct from the Holocene period.<sup>1</sup> According to this concept, humans have displaced rock, altered the chemistry of the planet’s atmosphere and soil, and covered vast stretches of the planet in steel and concrete, to the extent that the species has become a force of nature.<sup>2</sup> In the Anthropocene, humans have transformed the Earth in ways that rival or exceed the effects of plate tectonics, glaciation, and global weather systems. These changes derive from a globalized system of fossil fuel-use, from a world where people have erected a network of carbon-consuming machines and modern infrastructures which stretch across land, sea, and air, even infiltrating wilderness abodes like Rocky Mountain National Park (RMNP).<sup>3</sup> Ultimately, the Anthropocene idea is a useful tool for better understanding the contemporary global ubiquity of fossil fuel dependency, a dependency which reveals how even nominally wild places like RMNP are in fact distillations and productions of a hydrocarbon-centric society.

There are a host of scientific markers which undergird the relevance of the Anthropocene concept to RMNP’s history. Climate change, and more specifically the rapid increase in atmospheric carbon dioxide that has coincided with the mass burning of fossil fuels, is the most familiar sign of humanity’s vast effect upon the Earth system. But human-induced impacts go further. Industrial agriculture has altered the planet’s nitrogen, phosphorus, and sulphur cycles.<sup>4</sup>



Our species has harnessed rivers around the globe to provide water and energy to arid locales, reshaping both desert and riverine ecosystems to an extent whereby technological and ecological systems are no longer independent of one another.<sup>5</sup> Recently, rocks formed from an amalgam of plastic, volcanic rock, sand, seashells, and coral have begun to wash up on the beaches of Hawaii, representing geological examples of humanity's effect upon the planet's natural systems.<sup>6</sup> Finally, humanity appears to be triggering the planet's sixth great extinction.<sup>7</sup> In the past, cataclysmic events, asteroid impacts and ice ages among them, drove the mass extinction of various species. Now, humans appear to be inciting a global-scale mass extinction on par with nonhuman natural catastrophe. Geologist Jan Zalasiewicz, Chair of the Anthropocene Working Group of the International Commission on Stratigraphy, argues that geologists living a hundred million years from now will be able to detect these human-induced transformations to the Earth system in the planet's stratigraphy.<sup>8</sup>

Zalasiewicz's assertion that evidence of the human epoch will endure in geological layers is what separates the Anthropocene from other eras of anthropogenic environmental change. Humans, like all other organisms, always have shaped the planet's biological systems. While premodern hunting and agriculture certainly had major effects upon the planet's biota, such activity likely did not leave a record in the Earth's strata. According to many geologists, that has changed in the Anthropocene. Through accelerated industrialization and modernization on a global scale, humans have transcended their status as biological actors and become engines of geologic change. Modern modes of living will survive as a distinct marker in the fossil record. Premodern humans could not say the same. The most striking trace fossils that future geologists will encounter likely will be our cities, the remains of which will form, in Zalasiewicz's words, the "Urban Stratum." Concrete, steel, plastic, copper, and iron will survive for millions of years, acting as

geologic markers of humanity's present-day existence. The deep holes humans have mined out of the earth to extract coal and oil, necessary in powering modern cities, will survive long into the future. The various forms of nuclear waste humans have buried deep underground will persist and remain evident across the scale of deep time. Superhighways that connect cities, replete with tons of concrete, iron, and plastic, will leave traces in the strata, perhaps revealing to the most imaginative geologists the vast network of infrastructure that ties together the planet in the Anthropocene.<sup>9</sup>

In geological terms, this is what the Anthropocene is and how it has come to be defined. Other fields of the sciences and humanities have developed their own definitions of the epoch. Earth system scientists, who view the planet as a “total entity, stretching from its core to the upper atmosphere, in an unceasing state of flux driven by energy and material cycles,” argue for a broader definition of the Anthropocene, one that includes human interventions in the geologic record, while also incorporating our effects on chemical cycles that act upon various spatial and temporal scales. Still others utilize the Anthropocene as a concept that illuminates the effects of human civilization upon the natural world in totalistic terms.<sup>10</sup>

This thesis borrows from each of these definitions. Through the concept of the Anthropocene, I argue for the interconnectivity of hydrocarbon dependency on a global scale, and demonstrate how a growing worldwide reliance upon fossil fueled-energy systems left its mark upon not only cities, suburbs, and industrial farms, but also upon the people and animals who filter through the borders of American national parks.

Living in a natural world defined by novel climates and geophysical formations encourages historians to reorient their thinking regarding the human species and its relationship with the natural world over time. Climate change and the vast transformations to the Earth's natural systems

which people have produced are not simply technical issues with technological fixes. The Anthropocene is the product of a certain set of values, of ideas that humans have employed over time to organize and exploit the natural world. Unearthing and analyzing those values and ideas, and understanding how they have altered the natural world, is a task for historians, many of whom already grapple with humanity's desire to control and exploit their natural environments. The concept of the Anthropocene asks us to approach environmental history in ways that encourage historians to consider the entire globe as an assemblage of various energy-seeking and energy-consuming systems. The Anthropocene idea provides historians with a tool for writing novel local histories, stories situated in the context of a global system of intensive resource extraction, fossil-fueled mobility, and the political, cultural, and social institutions which undergird and are reshaped by the modern world's carbon-fueled exploitation of the planet.

Many humanists, social scientists, and natural scientists alike would argue that, as a concept, the Anthropocene is a tool for challenging the global enterprise of modern, hydrocarbon-fueled mobility and resource extraction that began with the Industrial Revolution and continues today. Certain groups of scientists and technocrats counter these declensionist stories by casting the Anthropocene as an idea that justifies human-induced engineering of the natural world. These thinkers and their ideas are important, and they will be considered in the conclusion of this thesis. In the meantime, I will focus on some of the historians who have contributed to discussions regarding the Anthropocene concept and its implications regarding time and modernity.

Oftentimes, historians have approached modernity as a social and political moment which encompasses a period of unparalleled human emancipation and the rise of democratic institutions. In the modern world, many groups of people once subjected to various forms of social, political, and economic shackling have struggled for and won control over their civil rights. The material

basis of this period of human liberation has been largely ignored, though. “Most of our freedoms so far have been energy intensive,” points out historian Dipesh Chakrabarty. “The mansion of modern freedoms stands on an ever-expanding base of fossil-fuel use.”<sup>11</sup> Our species’ modern dependence on fossil fuels is borne out in the Anthropocene, as mounting evidence suggests that, through hydrocarbon-dependent extraction and exploitation of natural resources and landscapes, we have become a geological agent of change. Modernity has left in its wake carbon dioxide-saturated skies and acidified oceans, the consequences of the industrialized world’s wealth. The modern fusion of technology with a deep-seated cultural expectation of economic growth has worked to plunder Earth’s nonhuman nature, as well as the physical bodies and livelihoods of certain groups of people.<sup>12</sup> The Anthropocene’s attendant consequences—rising seas, drought, mass extinction—will be, in the historian Donald Worster’s words, “unmistakably a modern disaster: disaster on a global scale that is thoroughly man-made—disaster that follows ironically on the heels of our triumph of the natural world and grows directly out of our high-energy way of life.”<sup>13</sup>

The concept of the Anthropocene also proposes that historians rethink how they conceptualize time. In 1949, historian Fernand Braudel published *The Mediterranean and the Mediterranean World in the Age of Philip II*. In this book, Braudel proposed that history operated on three distinct time scales: geographic time, social time, and individual time. Geographic time involved the natural world; flora, fauna, and climate, among other things. In Braudel’s view, geographic time actively shaped human history, but its components were largely static and unchanging in their nature. Such actors constituted the material context within which human events occurred, but that context was, in Braudel’s eyes as well as in the eyes of his contemporaries, passive and predictable. The other two streams of time involved human-induced trends and events.

Social time described long-term human institutions, “economies and states, societies and civilizations,” while individual time described the “history of events,” illustrated by the stories of war, individual leaders, and the changes inspired by the upheavals they fostered in the short-term.<sup>14</sup> These three time scales merged at certain moments, but Braudel conceptualized them as largely distinct from one another. Through including geographic time in the stories of people, Braudel sought to inspire a rebirth of history on a grand scale. The Anthropocene certainly promises such a history. In effect, the Anthropocene concept posits that Braudel’s geographic timescale has—through human decisions and actions—merged with the timescales within which human institutions and events act. Natural history and human history have become one.<sup>15</sup> Through modern technologies and institutions, humans have altered the planet’s vast biogeochemical systems and tinkered with the engines of those systems without knowledge of the fallout.<sup>16</sup> In the process, humans have condensed geologic change onto a temporal scale that resembles the rhythms and fluctuations of politics, economies, and societies.

The onset of the Anthropocene is undoubtedly a frightening proposition, but this novel epoch does provide historians with new opportunities. Perhaps most significantly, the concept of the Anthropocene has and will continue to foster collaboration between both humanists and scientists. The scientists who study climate, geology, and Earth systems have not shied away from the human dimensions of their study. Rather, they have sought partnerships with historians. Present-day interdisciplinarity inspired by the Anthropocene is best represented by the creation in 2004 of a global-sustainability working group known as “Integrated History and Future of People on Earth,” or IHOPE. Spearheaded by climate scientists, IHOPE is working towards the creation of an “integrated history” that tells the story of humanity’s interaction with nonhuman nature on the scale of deep time. And in creating such a history, IHOPE’s leaders believe “it is necessary to

integrate the different perspectives, theories, tools, and knowledge of multiple disciplines across the full spectrum of social and natural sciences and the humanities.”<sup>17</sup> The Anthropocene has inspired a historical project that goes beyond the themes and issues that historians usually confront. The onset of this epoch asks us simultaneously to historicize Earth’s natural systems and its human-social systems, an endeavor that requires interdisciplinary collaboration on a global scale. Even Braudel could not have imagined a narrative so grand.

This thesis will focus on one period of the Anthropocene, known as the Great Acceleration. Roughly beginning with the end of the Second World War (but with roots embedded deep within that global conflict) and continuing today, the Great Acceleration represents a period when important markers declaring humanity’s imprint upon the Earth’s natural systems rose sharply. Between 1945 and 2000, the planet’s human population doubled from 3 billion to 6 billion. In the first fifteen years of the twenty-first century, that number eclipsed 7 billion and rapidly approached 8 billion. The number of vehicles traversing the planet’s roads increased from 40 million to 700 million during the latter half of the twentieth century. Extraction and consumption of petroleum increased dramatically as well. Waves of people living in every corner of the globe left rural farms for cities and suburbs, movements facilitated by fossil fuel-intensive industrial agriculture and cheap, hydrocarbon-powered transportation systems. World War II acted as a wellspring of new and improved technologies which fostered the Great Acceleration. Fears concerning a Third World War inspired an era of globalization unlike any experienced in the planet’s history. Each of these interrelated processes was rooted in affordable energy, and each played a part in saturating the atmosphere in carbon dioxide, flooding river deltas with nitrogen fertilizer, and sacrificing numerous nonhuman species in the name of industrial farms, suburbs, and cities.<sup>18</sup> The human enterprise of modern development has grown at a rapid pace in this period. The Great Acceleration

represents not only material change, though. It also reveals a culture of consumerism, mobility, and unfettered prosperity.

### ***A Great Acceleration of Its Own: Rocky Mountain National Park in the Anthropocene***

I will situate the culture that has fostered the Great Acceleration in a specific place that likely does not leap to mind as a center of human-environmental declension: a national park. Specifically, this thesis will relate the postwar history of Rocky Mountain National Park (RMNP) to the Great Acceleration. Located in the Front Range of the Rocky Mountains in north central Colorado, RMNP is comprised of nearly 270,000 acres of stream-fed meadows, pine forest, and high-elevation tundra. The park harbors various wildlife, notably elk, moose, black bear, bighorn sheep, and ptarmigan, among others. The presence of these organisms, as well as the park's scenic mountain vistas and its proximity to Colorado's major urban centers, renders RMNP one of the most popular and most visited parks in the national park system. At least a million people have visited the park every year since 1948.<sup>19</sup> In 2015, for the first time in RMNP's history, visitation eclipsed the four-million mark. The park's history during the Great Acceleration represents a marked period of growth in visitation, intensive development of the park's transportation infrastructure, and increased pressures from urban-industrial forces situated beyond the park's boundaries.

Global population increase after World War II is one of the Great Acceleration's most compelling markers of planetary change. A similar spike in people populating RMNP and other national parks followed WWII. Visitation to the park grew throughout the 1930s and during the first two years of 1940, peaking at just over 680,000 people in 1941. Visitation predictably plummeted during World War II, but exploded after the war's end. By 1952, prewar levels of visitation had doubled, and those figures only continued to rise. Similar visitation increases

occurred at Yellowstone, Yosemite, and in the Great Smoky Mountains. Between 1935 and 1955, annual visitation to national parks increased by 50 million people.<sup>20</sup>

Americans were reproducing at high rates and enjoying a prosperous economy replete with newfound leisure time. This trend was borne out in the NPS's visitation statistics. The park service—as well as the United States and its increasingly global hinterlands—had to respond to the growing pressures of so many people and their starkly consumerist lifestyles. Momentum was growing towards a postwar culture—one rooted in automobiles, suburbs, and consumer goods harvested from around the globe—that was dramatically mobile and decentralized. Postwar developments like the family-sized car, the two-week paid vacation, and the interstates gave material form to an expectation of wealth and prosperity that defined American life. Family vacations to national parks, part of a larger postwar fascination with cross-country road trips that authors like Jack Kerouac seized upon, helped inaugurate an era of hydrocarbon nostalgia. Americans climbed into automobiles, airplanes, even ski lifts, and memories indelibly tied to those machines became increasingly prevalent in the lexicon of American culture. The NPS—often in the face of pushback—regularly embraced these trends, regardless of the social and environmental consequences.

This consumer-based, postwar culture and economy sprung from roots that reached back in time from 1945, to the nineteenth-century emergence of fossil fuels as a new source of motive power in the United States. In Colorado specifically, the exploitation of coal in the late-nineteenth and early-twentieth centuries powered smelters, steel mills, farmsteads, and railroads, freeing residents from the constraints of aridity and geographic isolation, and creating the material and demographic conditions for expedited urbanization during the middle decades of the 1940s and 1950s.<sup>21</sup> Oil soon followed coal's meteoric rise as a dense form of material energy. In Beaumont,



Texas, on January 10, 1901, the Spindletop oil field began gushing black crude at a rate of 100,000 barrels a day. The eruption of petroleum raged on for nine days. The events at Spindletop inaugurated an era of oil abundance that shaped American lives for the next seventy years. In the eyes of oil magnates, such explosive abundance had to be reined in, lest the petroleum industry run out of control. Thus, not only did new sources of widely available energy gush out of oil fields like Spindletop; so did a new standardized, technocratic, technologized form of managing the burgeoning global petroleum trade.<sup>22</sup>

Working with the federal government, the oil industry built networks of pipelines and storage tanks in hopes of mediating fluctuating prices and undermining the boom-or-bust nature of the petroleum business. This managerial ethos and its connection to the harnessing of energy only expanded in subsequent decades. In the 1930s, federal improvement projects like the Tennessee Valley Authority sought to foster and distribute flows of energy on vast scales that promised new forms of wealth and radical forms of democracy.<sup>23</sup> Likewise, as World War II approached, Franklin Roosevelt and other liberal politicians cast the “enjoyment of the fruits of scientific progress in a wider and constantly rising standard of living” as an unassailable right.<sup>24</sup> In the United States’ case, a deeper history of abundant material energy, fused with an expansive and instrumentalist state, created a techno-optimistic fervor that seemingly promised unending, transcendent progress. Victory in World War II affirmed these millennialist goals, and peace rerouted flows of material and political energy toward a mass-consumer economy, which helped reshape RMNP and other national parks.

The NPS helped foster a new scale of fossil fuel consumption in and around its parks through infrastructure development schemes like Mission 66. Signed into law in 1956, Mission 66 was a park service initiative devoted to the modernization of transportation infrastructure,

workspaces, and utilities in park units. Essentially, park units were to be reinvented through urban-style development, staff increases, and the purchasing of inholdings. Then NPS director Conrad Wirth—a landscape architect and a staunch supporter of development in the name of tourism—urged his colleagues to imagine revolutionized parks designed to manage the flow of visitors and their vehicles like well-oiled machines. Mission 66 expressed the Great Acceleration—the growing reliance on automobiles among Americans, increasing populations throughout the United States and especially in the American West, and the displacement of industry to faraway places, freeing up time and resources for the establishment and improvement of nature preserves like RMNP.<sup>25</sup> Mission 66 embodied a miniature-Great Acceleration within park units. During the project, the NPS built 1,500 miles worth of roads throughout the country’s parks. Congress funded the construction of 1,200 miles worth of new roads as well as 535 new water systems, 271 new power systems, and 218 new utility buildings.<sup>26</sup> The park service’s units welcomed acres of tarmac and concrete, scores of new power sources, and 50,000 additional vehicles, causing angry wilderness activists like Edward Abbey to declare the national parks centers of “industrial tourism.”<sup>27</sup> These changes took hold in RMNP, where new and widened roads and parking areas mediated the record number of visitors who were flowing into the park. Through modernization and technology, the NPS would deter overuse and avoid being loved to death.<sup>28</sup>

The NPS mimicked the Great Acceleration’s penchant for techno-optimism in this period, believing that it could separate roads, automobiles, and visitors from its natural resources through modern planning and infrastructure development.<sup>29</sup> The “paradox of preservation by development,” a phrase coined by Yellowstone superintendent Lon Garrison in the 1950s, underpinned the NPS’s postwar building programs.<sup>30</sup> This belief in the efficacy of modern technologies (almost always dependent on hydrocarbon fuel sources) and their ability to shield

humans from the vagaries of the natural world is essential to understanding the Anthropocene, and especially the Great Acceleration. After the Second World War, strains of techno-optimism permeated the American public lands system, federal programs geared towards urban development, and scores of other institutions central to American life.

The Forest Service faced many of the same pressures that the NPS experienced in the years following the war. Increasing numbers of timber demands and tourists inspired the building of nearly 65,000 miles of roads between 1945 and 1960. Rather than moderating both timber extraction and recreational use in the forests, managers decided to maximize production of both to the satisfaction of all stakeholders. In response to these pressures, “[a] consciously disseminated ‘can-do’ technocratic optimism imbued the Forest Service with a sense of mission and excitement,” writes historian Paul Hirt. “This ideological buoyancy found resonance and encouragement in popular American attitudes at that time celebrating prosperity and progress. In a sense, Americans became self-delusive in their enthusiasm for unending economic growth and technological manipulation of natural systems in pursuit of wealth and national power.”<sup>31</sup> The postwar strain of supercharged techno-optimism that shaped America’s public forests and parks was an accelerated corollary of past Americans’ embrace of, in Worster’s words, the “technological dominance” of nature in the name of development.<sup>32</sup> Through Mission 66 and other modernizing programs, the NPS and RMNP embodied, in their own limited but committed form, a faith in technology that is rooted deeply in American history and which was nurtured to new heights in the latter half of the twentieth century.

The urbanization of the United States’ public lands was tied to other developments which emphasize the Great Acceleration’s departure from previous norms. On the global level, postwar carbon-fueled movements of people and goods dwarfed any earlier period of globalization in

human history. World merchandise exports added up to less than \$60 billion in 1948, but were worth \$1.8 trillion by 1983 and \$7.4 trillion in 2003. This growth was predicated on a more open economic environment that pervaded the planet after the Second World War, but it was also dependent on the development of petrol-chugging technologies, notably diesel and jet engines.<sup>33</sup> Resources were extracted and moved at unheard of rates, eventually making their way into places like RMNP. More regional events helped funnel this global trade into the American West and ultimately into RMNP. By the end of WWII, the American West's major urban areas had exhausted their local resources. Civic leaders in Denver, Phoenix, Los Angeles, and a host of other cities developed a plan to tap into the arid Colorado Plateau's vast array of natural resources, concentrating the region's energy wealth into programs of industry and urbanization. Exploiting banks of coal, oil, and uranium, as well as the entire Colorado River watershed, the West transformed itself from an outback of eight million people into a modernized home of 32 million. Historian Charles Wilkinson does not exaggerate when he declares this regenerative process the "Big Buildup," and "one of the most prodigious peacetime exercises of industrial might in the history of the world."<sup>34</sup> This growing population of Westerners, supported by a network of rich energy flows, flocked to parks like RMNP, which became implicated in the region's growing demographic and economic might.

Changes indicative of the Great Acceleration that occurred at more local levels tied RMNP's new roads and visitors to the rest of the world. After the Second World War, Coloradoans lobbied for the development of highways, especially after the construction of the interstate system was signed into law in 1956 (the same year as Mission 66). For folks across the state, the promise of modern, fast-paced superhighways inspired, in historian William Philpott's words, "dreams that tourism might become the next gold rush, the boom industry to bring the backward little towns

and unsettled spaces of the high country into the modern age.”<sup>35</sup> Denver’s population had exploded during World War II, increasing from 322,000 in 1940 to 416,000 by 1950. Economic and demographic vitality brought a need for new and improved highways, a necessity which acted as the catalyst for the construction of two major interstates (I-25 and I-70) through and around the urbanizing Front Range. Denver’s civic leaders alluded to RMNP’s proximity to the state capital when lobbying in the 1950s and 1960s for federally-funded roads. Through these highways, Denver’s leaders and boosters, in tandem with the federal government, transformed the city into a sprawling metropolis with the infrastructure capable of streaming tourists and their wallets into the mountains—especially into RMNP. This growth trend extended across the state of Colorado. During the 1950s, the state’s population increased from 1.3 million to over 1.7 million.<sup>36</sup> By 1970, Colorado’s population had surpassed the 2.2 million mark.<sup>37</sup> Likewise, in 1970 Denver’s population eclipsed 500,000, more than doubling its pre-World War II figure.<sup>38</sup> Long a central node in the mining, processing, and transport of materials like coal and timber, which were harvested in the mountains throughout the nineteenth and twentieth centuries, road-building and population growth in and around Denver after WWII energized a growing tourist industry and facilitated the urban Front Range’s ability to further exploit the mountainous backcountry that lied to its west.<sup>39</sup>

Material and demographic changes indicative of the Great Acceleration reshaped the landscapes of Colorado’s Front Range, as well as RMNP. Broader changes grew out of the same trend. Postwar acceleration in infrastructure development was a global project, inspired by growing populations and Cold War politics, which created an expanding market for the exploitation of fossil fuels, timber, concrete, iron, mineral fertilizers, and a host of other resources that help constitute the Earth’s natural systems. Tourism was another commodity that found new

and growing markets in the Great Acceleration. New roads, engines, and technologies underpinned increased visitation to RMNP. In an ironic twist, though, this highly-energized, crowded, accelerated postwar landscape also fostered an increased appreciation for untouched wilderness. RMNP's history within the context of the Great Acceleration is not just one of urbanization and overcrowding, but also a story of growing environmental consciousness and activism.

Postwar Americans' desire to insert themselves into nature and to experience wilderness spaces was embedded in inexpensive gasoline, cheap automobiles, and new roads. Americans' automobile culture invigorated the country's suburbanization, but also citizens' increasing love for wilderness and subsequent activism in the name of its protection.<sup>40</sup> Postwar wilderness activism—highlighted by the 1964 Wilderness Act—was born out of the Great Acceleration and the hydrocarbon-intensive modernity that has created the Anthropocene. This is ironic, given how the fallout of this modernity could affect RMNP's ecosystems. Increased nitrogen deposition sourced from automobiles, industrial feedlots, and surrounding urban areas could decrease forest health and contribute to the spread of nonnative plants, especially in areas of the park above 9,000 feet. Mercury from coal-burning power plants continues to accumulate in the park's wildlife, traveling up the food chain as organisms ingest one another. Anthropogenic noise pollution from aircraft and automobiles has adverse effects on animal behavior.<sup>41</sup> All of these issues are related to wilderness preservation and living in the modern world—in the Anthropocene—and the ways in which both interact. These material changes, which were largely rooted in postwar development along the Front Range, emerged in an era of relative wealth, when American cultural mores, from suburbanization to the rise in cross-country family vacations, increasingly depended upon cheap fossil fuels that increasingly funneled more and more people into parks like RMNP.

The three chapters of my thesis will operate at this intersection between modern, hydrocarbon-dependent modes of living, viewing the park, and protecting its nonhuman nature. The first chapter deals directly with noise pollution in RMNP, a problem that did not afflict the park until the global postwar growth in general and commercial aviation. Immediately after World War II, pro-tourism advocates lobbied for the building of an airport that would directly serve Estes Park, RMNP's primary adjacent tourist town. Though unsuccessful, their efforts reflected commercial aviation's rise. An increasing number of aircraft flying in and out of Denver streamed over the park in the years following the war, as Colorado's capital city—supported by its new plethora of highways—became an international hub of commercial aviation. As the twentieth century wore on, park advocates, in the name of wilderness protection, fought for rules governing flights over and around the park. The arguments these advocates espoused as they struggled to ban sightseeing flights over the park revealed the relationship of modern, fossil-fueled machines to the evolution and meaning of wilderness experiences in RMNP.

In chapter two, I write about the history of Hidden Valley Ski Area, a ski resort that operated in the park from the 1950s until 1992. Hidden Valley's history mirrors a broader history of wilderness advocacy in the NPS and among Americans in general. A tourist-centric development embraced by the NPS at first, in the 1970s the park service deemed the ski area too industrial and commercial for its liking. Engrained in the history of Hidden Valley and modern skiing in general is a story of fossil fuel dependency, technocratic optimism, and globalization, all institutions central to understanding the Great Acceleration. Via the wilderness recreation industry and companies like the North Face and Patagonia, our hydrocarbon-fueled, globalized economy continues to be embedded in Hidden Valley, which is now a designated wilderness and hiking spot. I will analyze the material continuities that tie together the modern skiing industry and

wilderness recreation, and how those consistencies continue to connect Hidden Valley to the modernity that has created the Great Acceleration.

Finally, chapter three will reveal how postwar preservation efforts in RMNP—notably the management of the park’s iconic elk herds—was intimately tied to fossil-fueled technologies and modern infrastructure. Utilizing jeeps, helicopters, radio-tracking devices, and Colorado’s burgeoning highway system, the removal and culling of elk in and around the park became highly dependent on postwar hydrocarbon-powered technologies and urban networks. RMNP’s responses to elk drew upon a growing postwar trend whereby surplus military equipment was increasingly applied to non-military problems, including in the national parks. Growing urbanization outside the park constrained elk migration, and the solution was to manage the ungulates in the park via technologies fostered by the urban-industrial society that was also transforming Colorado’s wildlife geography. Today, through participation in initiatives like UNESCO’s World Biosphere Reserve program, RMNP remains fixed to a global scientific community forged in the Great Acceleration.

Each chapter contains its own arguments, but they work together to show how RMNP’s postwar history interweaves in various ways with the Great Acceleration. In effect, RMNP became a global park after WWII, its wildlife, managers, and visitors increasingly pressured by and integrated into a world community energized by fossil fuels, urban-rural networks, and a culture of hydrocarbon-driven affluence. Understanding this requires understanding how RMNP interacted with the supercharged, interconnected modernity that proliferated both locally and globally after the Second World War. The Great Acceleration is an effective tool for understanding those interactions in their totality. Throughout the park’s postwar history, managers, volunteers, and outside advocates have struggled to conserve an often unwieldy network of developed areas



and wilderness, an odd mix of the urban, suburban, and seemingly pristine. Even after the NPS rebuffed the concerns certain managers had about the biological effects of developments like Mission 66, they continued to work towards sensible care of national park wildlife in the face of the inevitable pressures caused by so many visitors.<sup>42</sup> Parks like RMNP have flourished as vacation spots in the Great Acceleration, but they also remain havens for nonhuman nature, for organisms that live under an increasing number of anthropogenic threats and pressures.<sup>43</sup> Throughout this thesis, I will address a number of contemporary problems that arise at the nexus of these interests. RMNP's postwar history illuminates certain aspects of this quandary, one that vexes environmental historians as well as conservation scientists and public lands advocates.

## **Chapter I: Listening to Global Environmental Change in Rocky Mountain National Park**

I hiked Ute Trail in Rocky Mountain National Park (RMNP) in October 2014. Colorado had only been home for two months, but I had already managed to visit the park three or four times over that span. I finally had the opportunity to spend an entire day hiking, though, and I was excited. Would there be elk? Maybe late season hawks flaunting the thin air? Wildlife encounters or not, I relished getting away from my cramped apartment in Fort Collins and the chaos of graduate school. My expectations did not seem unreasonable. But perhaps “getting away” had been too much to ask. That fall Saturday, Trail Ridge Road, which would carry me and my Ford Focus to the trailhead, resembled a Southern California freeway. Cars rumbled and lurched, two miles above the sea. Autos congealed in the parking areas that line the road, little pockets of idle disorder. Once I set foot onto the trail, the cars’ mechanical drone continued to ring in my ears, propagating across rock and ridge, still audible as the road receded from sight. It became a sound without a visual source, but striking nonetheless. As I continued to walk, eventually out of earshot of Trail Ridge, screaming jet engines ferrying passengers to and from nearby Denver International Airport replaced the rumble of rubber meeting asphalt. Perhaps I should have closed my eyes and imagined the cars as thunder and the planes as crying birds, but my imagination would not stretch so far.

I began to envision Ute Trail as an urban alleyway—perhaps not to the eyes but certainly to the ears. And I could not help but feel a bit guilty for my own contributions to this sonic cluttering of the sky. After all, I had relied on my car to carry me to the trailhead, and roughly a month into the future I would be flying home to Indiana for Thanksgiving. Something else struck me as well, though. All of the noise that bombarded me along the trail had been mechanical, and more specifically, rooted in fossil fuels. And the noises were the same noises that I, ironically

enough, thought the trail would facilitate an escape from. How did I get *here*? How did this expanse of wildland in northern Colorado become so noisy, and had anyone noticed before me?

### ***The Great Acceleration: Growing Affluence, Growing Noise***

Indeed, others had noticed and had even fought mechanical noise's presence in RMNP. Political pushback against noise in the park arose in the late-twentieth century, and this period of activism was rooted in changes to the park's soundscape that began to manifest in the mid-1900s. The end of World War II inaugurated an era of unprecedented prosperity in the Western world. RMNP was one locale that relished the American middle class's growing wealth and newfound commitment to leisure. During the 1950s and 1960s, the National Park Service (NPS) expanded park infrastructure, accommodating and encouraging increased visitor use. Subsequently, the park grew progressively cluttered and noisy. Its roads became clogged with visitors' automobiles and the skies above echoed with the by-products of Denver's postwar role as an air travel hub. Such changes engendered a dichotomy in the late-1960s and 1970s between pro-tourism advocates and RMNP's wilderness promoters, who lamented the park's conspicuously urban character. The ways in which people mediated noise pollution in RMNP from the 1980s onward represented a shift in the tourism versus wilderness dichotomy, though. Furthermore, the global changes that forged RMNP's twentieth-century industrial soundscape, as well as institutional responses to noise pollution, represent several core features of the Anthropocene—a new geologic epoch that supposes that humanity has become a force of nature, and which scientists and historians have begun utilizing when narrating humans' increasingly taxing effect upon the Earth system. I will argue that a history of noise pollution in RMNP can illuminate local changes in the park that are endemic to the Anthropocene, especially changes wrought after WWII.

The unprecedented number of automobiles and aircraft traveling in and around RMNP from roughly 1950 onward facilitated increased visitor use, but also imperiled park resources. Historian C. W. Buchholtz illuminated the tensions present during RMNP's mid-century urbanization: "People started to ask whether the Park could honestly be a wilderness preserve and also supply such things as automobile camping sites for every traveler who expected one. Observers wondered whether park planners had curried too much favor with concrete and Cadillacs."<sup>44</sup> While historians have confronted the contradictions inherent to urban-style development in the national parks, few have engaged noise pollution specifically, or displayed the ways in which increased visitation and the proliferation of mechanical technologies reshaped park soundscapes after 1950. Most importantly, historians have not explained how different noises represented different cultural values which people expect to be embodied in parks like RMNP. During the latter decades of the twentieth century, visitors, the NPS, and residents reliant upon park revenues fought the invasion of certain anthropogenic noises while largely ignoring others. Stakeholders couched certain fossil-fueled technologies—notably aircraft—as noise pollutants, but embraced other noise emitters, such as cars, for economic and cultural reasons.

Through understanding how noise was valued in differing ways in and around RMNP, we can better understand the ways in which managed soundscapes are integral to the construction of wilderness in public lands. Noise pollution in RMNP inspired pragmatic, ameliorative responses from local stakeholders who sought solutions by more clearly defining the park's wilderness character. Local stakeholders—whether they realized it or not—were not only speaking to localized aural nuisances, though. Their concerns about noise in RMNP are indicative of global environmental changes that have occurred during the Anthropocene. The Anthropocene—proposed in 2000 by scientists Paul Crutzen and Eugene Stoermer—represents the historical era

in which human activity became the planet's primary engine of biogeochemical change. This chapter will use one of the phases of the Anthropocene—the Great Acceleration—as a tool for understanding the environmental history of RMNP.<sup>45</sup>

In the first and second sections of this chapter, I will illustrate mechanical noise's increasing prevalence in RMNP from the end of World War II onward, as well as the attendant political controversies concerning noise pollution which reverberated throughout the communities surrounding RMNP. Noise pollution grew as a political issue in and around RMNP, as well as across the United States, from the 1950s onward, a timeline which coincides with the Great Acceleration. The increase in automobile and air travel in this period, both globally and in and around RMNP, was dramatic. Consequent increases in the presence of mechanical noise, which largely continue today, are material artifacts of Americans' changing relationship with the natural world in this period. A wealth of fossil fuels, new prime movers, and international governmental cooperation energized a globalized economy which, in the latter half of the twentieth century, produced the Great Acceleration. While nature preserves and centers of outdoor recreation, including RMNP, have often been cast as places of escape from this commercialized, fast-paced society, I will argue that the park, in its late-twentieth-century iteration, was a product of these urban-industrial networks.

Noise pollution is experienced locally, and that was no different in RMNP's case. This fact seems to place noise and the Anthropocene at odds as conceptual tools, considering the Anthropocene is a period highlighted by humans' effects on the whole Earth system.<sup>46</sup> Noise and the Anthropocene do not appear to operate at the same scale. But a network of private technologies supported by national governmental agencies undergirded the automobile and aircraft noise that have become ubiquitous in and above RMNP. These same institutions helped to foment an era of

global environmental change. The last part of this chapter will address these postwar realities. The Anthropocene, and especially the Great Acceleration, need to be understood as products of certain social and cultural relationships between humans and the material world. One of these relationships involves the ties that have formed between the natural world and federal resource management agencies. Historians have come to understand land management agencies such as the NPS, the Forest Service, and the Bureau of Reclamation as administrators of the United States' natural resources, and as bureaucratic bodies that have, through the management of natural resources, carved out a powerful niche in the United States government.<sup>47</sup> But when seen through RMNP's twentieth-century noise pollution controversy, the Federal Aviation Administration takes on the guise of a natural resource manager in its own right. The FAA made sense of the nation's skies. As a result, they made the private development of aeronautical technologies a viable business model, assuring commercial airlines that the country's airspace would be legible and therefore flyable.<sup>48</sup> This represented a growing, globalized transportation infrastructure which has produced and consumed materials at precipitous rates, all through energy provided by fossil fuels. In this sense, federal bodies such as the FAA are a product of the Great Acceleration and have helped advance the Anthropocene.

The FAA acts as steward to noise pollution in the parks, notably in RMNP. It is their rationalized geography which aircraft utilize as they descend over the park. As an important body in facilitating global transportation, the FAA's role in the Anthropocene is evident. But what about the NPS? The park service encouraged automobile-centric park visitation through programs like Mission 66, for one. But that was before the environmental movement had fully taken shape, when wilderness preservation became one of the NPS's enduring legacies. What about in the latter portions of the twentieth century, when the park service nurtured the perpetuation of untrammelled

nature? Out of the noise pollution controversies which occurred at RMNP and other parks, the NPS developed the Natural Sounds and Night Skies division. This branch of the park service is representative of modern nations' propensity for facilitating and disseminating scientific study of the natural world. The NPS is an outgrowth of a certain culture, though; one that values both cultural artifacts and seemingly pristine nature. Indeed, the park service has defined its aural resources as being either "natural" or "cultural." However, environmental historians would be wary of such a stark division between nature and culture, and the Anthropocene insists that natural and cultural resources, even down to their material makeup, are often one and the same. The NPS has constructed a system of knowledge production through the Natural Sounds and Night Skies branch, and I will address some of the assumptions made by their categorical system concerning both RMNP's environmental history and the Anthropocene.

### *Listening for Historical Change in RMNP*

Postwar affluence fostered increased visitation to RMNP, and the subsequent expansion of park infrastructure. In turn, industrial sound—notably from automobiles and aircraft—began to infiltrate the park at increasing rates. RMNP's post-WWII soundscape would have been predominantly structured at two spatial scales. The growing number of automobiles carried sound in numbers. The impact of this form of invasive noise was channelized to a certain extent, and would have been predominantly experienced by drivers, passengers, and occasional hikers.<sup>49</sup> Automobiles fostered localized noise, but increased air traffic in and around Denver would have infiltrated RMNP's natural soundscape in more far-reaching ways. Aircraft are unique noise emitters. "The plangent voice of the airplane motor beams down directly on the whole community, on roof, garden and window, on farm and suburb as well as city," notes soundscape researcher R. Murray Schafer.<sup>50</sup> In the latter decades of the twentieth century, this bipartite geography of noise

played a part in how residents living near RMNP defined and valued different sounds. But before addressing the political tensions this changing soundscape aroused, I will attempt to describe the anthropogenic changes to RMNP's soundscape which were fomented by the Great Acceleration. While this more cluttered soundscape cannot be directly traced and recast via traditional archival sources, it can be reconstructed using data that illuminates the number of automobiles that entered the park, growth in air travel in the Denver-area, and the changing nature of visitor use in RMNP.

Visitation to RMNP had been growing before the Great Acceleration. Even in the 1930s, in the midst of the Great Depression, annual visitation grew by almost 400,000 people.<sup>51</sup> Ambitious road-building projects were undertaken in RMNP in the thirties. Trail Ridge Road, an important factor in the story of RMNP's soundscape, was completed in 1932. Its building was central to a national strategy whereby, according to historian Jerry Frank, "the NPS labored to construct roads that amplified, illuminated, and made accessible spectacular natural scenery."<sup>52</sup> Trail Ridge Road's construction was an important moment in RMNP's history, but its existence also became integral to the history of the area surrounding the park. Historian Cori Knudten points out that Trail Ridge Road provided a "locus for development" in and around the park. The road illustrates how national park visitation is deeply rooted in an auto-centric, urban-industrial infrastructure highlighted by gas stations, fast food restaurants, and motels.<sup>53</sup> Trail Ridge Road has acted as an urban stream of sorts, tying the park to a broader urban-industrial framework, and by extension bringing more mechanical noise into the park. But relative solitude could have been found in RMNP, even as the middle decades of the twentieth century approached. World War II would have marked a quiet period in the park, as funding, staff, and park vehicles were sacrificed to the war effort.<sup>54</sup> Visitation predictably plummeted. But with VJ Day came ringing church bells and blaring music in towns like Estes Park, RMNP's gateway community.<sup>55</sup> Such celebratory cacophony inaugurated a



transformative era for the soundscape in and around the park. Newfound wealth, leisure time, and a more mobile middle class led to a rise in national park visitation. The NPS continued to fund road-building in its parks, but private companies also promoted parks as automobile-centric spaces.

Automobiles have always been integral to RMNP. The park's founding legislation defines RMNP as an auto-centric national park, one that would be open to people only so long as it was open to cars.<sup>56</sup> But the number of automobiles traveling in and out of the park exploded in the 1950s. Petroleum companies like Skelly Oil and Standard Oil produced road maps that often included insets depicting a detailed map of the Denver area, including RMNP. As promotional materials, these maps contained images of families joyfully filling their cars with gas, couching auto-tourism to places like RMNP as an embodiment of a certain mid-century suburban idyll.<sup>57</sup> These materials represent two important facets of the history of industrial noise in the park. For one, the maps illustrate mid-twentieth-century growth in the U. S. transportation infrastructure, and even connect the park to that larger, national infrastructure.<sup>58</sup> It was no coincidence that Mission 66—the NPS's midcentury program for updating infrastructure—was legislated in the same year as the national interstate system. Increased mobility ultimately meant increased levels of noise in the park. Standard and Skelly's maps demonstrate how fossil fuels were becoming increasingly engrained into American culture. While national parks might seem like spaces largely immune to social and economic shifts rooted in fossil fuels, they are in fact a product of those shifts. Americans' commitment to coal and oil drove down timber demands, making preservation economically feasible.<sup>59</sup> Cheap oil also facilitated the building of roads and automobiles that could carry tourists to preserved spaces like RMNP. More roads and more cars inevitably meant more noise, and automobiles dominated that park in the 1950s and 60s.

Visitation to RMNP increased from just over 800,000 people in 1946, to 1.5 million by 1956.<sup>60</sup> Something had to be done to decrease pressure on the parks in the face of this influx of people and their vehicles. The solution was Mission 66. Signed into law in 1956, the plan was to overhaul the park system's infrastructure, and to do so in the span of a decade. Importantly, Mission 66 embraced midcentury increases in park visitation. The park service and RMNP embraced the influx of tourists by expanding roads and parking areas. As Frank puts it, the NPS believed that "the key to saving the 'system' lay not in curtailing visitation but in facilitating more of it."<sup>61</sup> As a result, park visitation continued to increase, with over 2.5 million annual visitors to Rocky by 1972. Mission 66 coincided with both regional and national road-building programs. President Eisenhower signed into law the National Interstate and Defense Highways Act in 1956. At the same time, public employees of the city of Denver began tapping into newfound federal funds to improve roads and highways that channeled Front Range urbanites and suburbanites into mountain getaways like RMNP. Mission 66 existed in tandem with these larger infrastructure-improvement projects, rendering the Rockies more exploitable by way of the automobile than ever before.<sup>62</sup>

Simultaneously, the United States increased automobile production 64% between 1961 and 1971.<sup>63</sup> Again, promotional materials produced by oil companies illustrated the ways in which the park system had become embedded in the United States' carbon-rich, ultra-energetic postwar economy. Sinclair Oil, Philips Petroleum, and Standard all produced maps, ads, and promotional guides which touted Mission 66 and the country's national parks.<sup>64</sup> These promotional materials reflect the auto-centric nature of park tourism in the 1950s and 1960s. Correspondingly, the types of cars sold in the 1960s reflect the nature of the mechanical noises that entered the park during this period. Ford Mustangs and Chevy Impalas were the era's big sellers.<sup>65</sup> These "muscle cars"

utilized large V8 engines which created a considerable amount of noise. Ford and Chevy, the two biggest players in the American automobile market at the time, acknowledged as early as 1966 that their cars had grown too loud, perhaps best conveyed by a new Chevy slogan at the time: “The Shhhhhhhhevrolet Way.”<sup>66</sup>

“Muscle cars” remained popular in the ‘60s and ‘70s, and efforts to promote quieter models brought little change. In 1972 Congress passed the Noise Control Act, which enabled the Environmental Protection Agency to regulate commercial vehicle noise, but not passenger vehicle noise.<sup>67</sup> At the same time, General Motors was imploring its customers to purchase muscle cars. “Press the accelerator, it roars,” they promised.<sup>68</sup> Estes Park residents even noted the presence of overtly noisy cars during the air tour controversy in the 1980s.<sup>69</sup> Contemporary scientists have used indirect evidence to argue that the 1960s and 1970s were important points in the growth of an increasingly cacophonous world, noting that between 1970 and 2007 the United States’ population increased by one-third, while its automobile traffic tripled.<sup>70</sup> Mission 66 facilitated an increase in the presence of noisy technologies in Rocky, and bolstered the park system’s commitment to car-centric visitation, thus facilitating more car-induced noise.<sup>71</sup>

Changes to the region’s and nation’s transportation infrastructure occurred on a scale which transcended both the national parks and automobiles. Postwar affluence—as well as political developments at the federal level—precipitated an explosion in commercial aircraft use. With the creation of the FAA in 1958 and the development of commercial jet aircraft, Denver saw an increasing number of flights. Airlines advertised in promotional materials distributed by Estes Park. Tourist literature produced by the city focused specifically on the park, but also highlighted the park’s proximity to modern, urban-style amenities like airports and auto garages. Brochures from the 1950s and 60s listed options for transportation from Denver to Estes Park.”<sup>72</sup> Promotional

materials were largely geared towards a national audience. Buses could transport passengers arriving to Denver via six airlines, including Continental, Frontier, United, Braniff, Western, and Flying Tigers, carriers which made Denver the third busiest air center in the nation.<sup>73</sup> These mid-century brochures also denoted national changes in the nature of air travel. Brochures from the 1940s listed air travel times from, for instance, New York to Denver, as 14.5 hours. By the fifties, though, technological advances and efficient travel schedules placed Denver “not more than 8 hours flying time from any point in the U.S.”<sup>74</sup> The state capital’s proximity to RMNP had long been a plus for travelers, but it also meant that more aircraft began to descend and ascend near and even directly over the park. Denver’s close proximity and relative height compared to the park means planes flying to and from Denver swoop within fairly close proximity to RMNP’s roads and trails.<sup>75</sup>

How might aircraft have begun to change RMNP’s soundscape at the onset of the Great Acceleration? According to the Department of Transportation, from 1956 to 1966, revenue passenger miles increased from 1.5 million to just over eight million per year.<sup>76</sup> Not only did the number of flights increase dramatically during this period, but technological change made aircraft noise more conspicuous. Beginning in 1957, the scream of jet engines began bombarding visitors on a regular basis via the Boeing 707, the first successful commercial jet aircraft. Aircraft flying between Denver and, for instance, Seattle, would have travelled directly over the park at roughly 20,000 feet above sea level, less than 10,000 feet above the majority of the park.<sup>77</sup> By 1971, seven Continental Airlines flights per day flew the Seattle-Denver route, each plane roaring at between seventy and 140 decibels, depending on the position of the listener.<sup>78</sup> The noise would have been broadcast across the park and the surrounding area, a resonant sound that only increased in frequency in subsequent years. The soundscape in and around the park was urbanizing, and it was

part of a global trend. “Noise is one of the scourges of the modern world,” wrote legal scholar James L. Hildebrand in 1970. “It is an unwanted product of our technological civilization, and it is becoming an increasingly dangerous and disturbing environmental pollutant.”<sup>79</sup> Through the simultaneous expansion of automobile presence and the proliferation of commercial flights in the area, we can imagine cackling pistons and an overlying, subsonic roar creating bipartite layers of noise in and around Rocky in the decades following WWII. Garret Keizer notes that “peak-season decibel levels in the front areas of certain major parks rival those of New York City streets.”<sup>80</sup> This expansion of mechanical noise in the park largely began in the postwar years. In 2014, 3.4 million people visited RMNP, and 600 commercial flights are presently routed over the park each day.<sup>81</sup> The population growth, increased globalized mobility, and rising affluence essential to the Great Acceleration were being felt in the park. As the twentieth century bore on, Rocky’s stakeholders would become progressively uneasy about perpetuating such a noisy wilderness.

### ***What is “Wilderness” to an Airplane?***

Postwar increases in visitation and urban-style consumption in the park led to push back from Americans displaying a newfound environmental consciousness. A dichotomy grew between those who saw RMNP as a space containing the last vestiges of American wilderness, and those who believed that the park should do its best to cater to tourists, especially the majority of visitors who experienced the park via automobile. It was in the shadow of this dichotomy that issues over air tours in and around the park arose. Beginning in the early 1980s and finally resolved in the mid-1990s, arguments raised against air tours in RMNP took on a different tone than might be expected. Detractors who feared that aircraft would ruin RMNP’s wilderness character argued that aircraft noise would push tourists away. This was a far more pragmatic, constructive pro-wilderness argument than previous wilderness advocates had espoused. Noise pollution occupied

a middle ground between earlier dichotomies, and efforts to ban air tours in RMNP led to wider changes in how the NPS managed soundscapes and wilderness character.

The late-twentieth-century tensions over air tours in RMNP stand in stark contrast to the infrastructure advances that park stakeholders promoted in the 1950s and '60s. A local airport committee tasked with purchasing land and seeking government funding for an airport in Estes Park was formed in the 1950s. Early supporters of a new airport in the town rationalized development in several ways. Serving Estes Park's and Colorado's growing populations was one incentive, as was facilitating fire fighters in case of forest fires.<sup>82</sup> A businessman centered in Denver named Woodrow Bussey even posited that the airport would be important in aiding civil air defense measures and evacuations "if the bomb drops."<sup>83</sup> Major General Lucas Beau of the U. S. Air Force saw similar incentives as Mr. Bussey, and wanted to build airports within park boundaries.<sup>84</sup> Tourism was the ultimate incentive for new airstrips, though. "Estes Park is an unique town," Estes Park's Airport Committee wrote in 1964, in a presentation to Colorado Governor John Arthur Love, "partly because of its mountainous scenery, partly because it is a one-industry town and has been for a hundred years. Tourism is our business."<sup>85</sup>

The Airport Committee's presentation to the governor detailed how residents of Estes Park related to RMNP and urban development in and around the park. This midcentury call for an airport that would serve RMNP also represented a wider program whereby the park service sought to integrate the parks into a growing national transportation system. Indeed, the Airport Committee picked up on this multi-scale process, noting how important it was for Estes Park to have clear roads connecting RMNP to urban centers like Denver. Furthermore, park visitation had grown to the point that air travel needed to accentuate car travel. "People go where they are well-received and where facilities are provided for them," the committee argued. "Without roads into Colorado

(and good, high-speed roads), we would have few visitors. Without airports, flyers will pass us by and go where they can land their airplanes.”<sup>86</sup> The Airport Committee was not worried about noise pollution issues. Minutes from a 1962 Committee meeting noted that certain local residents objected to an airport due to noise.<sup>87</sup> But this did not seem to be a great concern to the Committee, which was more interested in negotiating property purchases from local residents. However, it would only take twenty years for a dramatic shift to manifest in how Estes Park rationalized aircraft noise.

That shift would in part be rooted in the tourism-versus-wilderness debate that was heating up as the Airport Committee and others argued for more planes in and around the national parks. With the passing of the Wilderness Act in 1964, “the preservation aspect of national parks finally received equal attention with recreational use,” Buchholtz writes.<sup>88</sup> The parks were tasked with setting aside a majority of their terrestrial property as “untrammelled” wilderness. The park service reacted to the Wilderness Act ambivalently, though. Many park service personnel believed that the Organic Act was the only piece of legislation that should dictate NPS policy. Local groups also used the Wilderness Act as a mechanism for affecting change within federal agencies, criticizing the demands that land agencies made upon landscapes that locals felt a sense of ownership toward. Such local action in the face of federal inaction would precipitate the air tour ban in RMNP. Before World War II, federal bodies like the NPS had implemented policies without much backlash. But galvanized by the environmental movement and increasingly distrusting of the federal government, local groups began to find footholds in the struggle to control land and resources on their terms.<sup>89</sup>

The Wilderness Act may have all but ended General Beau’s hopes of establishing airports *inside* parks, but it did not protect the airspace over parks from becoming acoustically trammelled.

There were, at the time, park advocates worried about air travel and the noise inherent to airports. Scientists F. Fraser Darling and Noel Eichhorn produced a critical report covering wilderness characteristics in the parks in 1967. Darling and Eichhorn were worried about urban style development in and around the parks, and they specifically used Estes Park as an example “that some people visiting national parks desire some of the amusements reminiscent of Coney Island.”<sup>90</sup> Both lamented the park service’s inability to foresee the changes that would be wrought by the internal combustion engine. And while Darling and Eichhorn were primarily worried about automobiles and increased hotel-style lodging within parks, they also nodded to the presence of aircraft, and implored the NPS to be wary of air travel. “Certainly it must keep its ear close to the ground,” they wrote, “to hear about such developments as the projected jetport adjoining the Everglades and the access highway through the park, before the wretched scheme becomes as good as a *fait accompli*.”<sup>91</sup>

Automobiles and, more broadly, automobile-centric tourism remained the primary threat to RMNP and other parks. Historian Paul Sutter notes that automobile presence in the parks during the interwar period was the impetus for the creation of the Wilderness Society, a body which played an integral role in passing the Wilderness Act. Aircraft did not begin to really worry wilderness advocates until after the Wilderness Act had been legislated. But the scene had been set for tensions over aircraft noise to manifest. The planned airport at the Everglades was part of a wider national program of building airports at or near national parks, which was a subset of nationwide airport building campaigns facilitated by the establishment of the FAA. By instituting a body that would make the sky legible within the context of national governmental power, concepts like “solitude” and “tranquility,” central to wilderness parks like RMNP, became threatened.



The 1970s would see a continuation of tensions between wilderness advocates and tourism promoters. The material infiltration of people, roads, lodging, and automobiles remained rooted fast to the earth, though. Untrammelled wilderness became a destination in and of itself. While the number of vehicles in RMNP continued to increase, so did the number of people getting out of their cars and taking the backcountry by foot.<sup>92</sup> But, again, these developments were largely rooted to the ground. Aircraft noise provided new problems beginning in the 1980s. As tangible as trampled tundra and smoggy air, aircraft noise presented relatable but original problems when compared to previous tensions between technologies and wilderness in RMNP. A new set of spatial questions inherent to the sonic by-products associated with aircraft led to new arguments about the nature of wilderness in RMNP, and the role that transportation technologies should play within the context of perpetuating that wilderness.

Commercial air tour services inquired about setting up shop in Estes Park beginning in 1982. Air tour companies rationalized their would-be roles as members of the Estes Park community in similar ways to those who had lobbied for a new airport in the mid-twentieth century, claiming that their helicopter services could aid search and rescue missions and fire fighters, as well as become an economic boon.<sup>93</sup> Jerry Noland of Luebell Helicopters directly countered Darling and Eichhorn when arguing for his company's presence in Estes Park and RMNP, saying, "This will be no Coney Island type of operation; we offer something that most tourists remember as the highlight of their vacation."<sup>94</sup> The Estes Park Board of Trustees vetoed the air tour companies' proposal, though, beginning a reordering of wilderness advocacy in and around RMNP. The town board, as well as the park, were concerned about noise pollution, both in the context of visitor experience and wildlife.<sup>95</sup> To them, "Coney Island" represented more than a style of business, but also an unwanted noise regime. One objector to the tour services argued

that “Estes Park is one of the few quiet places left in the world. Noise is what people come here to get away from.”<sup>96</sup> Others specifically decried how helicopters would interrupt RMNP’s wilderness character, and some residents felt that air tours would be a net-negative economically. Tourists, attracted by the park’s tranquility, would be driven away by rotors buffering the sky.<sup>97</sup>

This was a subtle but specific point that would only grow in importance throughout the eighties and nineties. The 1960s had introduced new wilderness advocates to the forefront of park policy. Their influence was strong, perhaps illustrated best by the establishment of North Cascades National Park in 1968, a roadless park, inspired by the language of the Wilderness Act.<sup>98</sup> Conflicts related to noise pollution and commercial development in and around other national parks also arose in this period. In 1975, the Grand Canyon National Park Enlargement Act addressed the issue of preserving natural quiet in the face of increased pressure to provide air tours.<sup>99</sup> Historian Robert Righter, assessing the state of Grand Teton National Park in 1982, acknowledged then-existing pressures to expand Jackson Hole’s airport in order to accommodate increased visitation to Grand Teton. The “conflicting claims of commercialism and conservation are often joined,” Righter argued, and the same tension was seemingly being felt in and around RMNP.<sup>100</sup> However, many of RMNP’s anti-air tour advocates were in fact pro-commerce in many ways. Whereas those who had a hand in establishing parks like North Cascades were wary of any sort of capitalist-style consumption in the national parks, the idea that certain tourist-centric entities could in fact drive away visitors suggests that “wilderness” was conceptualized by RMNP’s advocates as a consumable product that should be closely guarded. And that product could only be perpetuated with “silence” at its core.

David Mooney articulated how silence was central to RMNP’s uniqueness in a letter-to-the-editor published in the *Estes Park Trail-Gazette* in 1982. Mooney urged the air tour companies

to better understand “the great importance that silence plays in drawing millions of people to this area.”<sup>101</sup> Mooney even quoted Enos Mills, who championed RMNP’s creation at the turn of the twentieth century, and who understood how silence was both a tangible, sensory experience and a culturally-created value that people utilized when trying to escape the noisiness of modernity.<sup>102</sup> Mooney’s eloquent articulation of the air tour problem is important for its apparent contradictions. The idea that silence could be perpetuated even as it roped millions of visitors into the Estes Park area is problematic. Estes Park residents and the park service were indeed not interested in creating a total absence of anthropogenic noise in the park. This had been a goal of some wilderness advocates such as Edward Abbey in the mid-twentieth century, and contemporaries of Abbey’s like Sigurd Olson, who argued that silence was “more than just an attribute of a wild place. Silence was its essence.”<sup>103</sup> But Abbey, among others, decried the commercialization of national parks. Mr. Mooney’s letter, as well as testimonies from other residents, show that their definition of “silence” could in fact allow for noises that echoed pragmatic economics. Thus, growing tensions over noise pollution in and around RMNP created a debate over more than decibels, but also a debate over how wilderness would be defined and in turn preserved in the ultra-energized, mechanized twentieth century.

Paul Sutter reveals in his book *Driven Wild* that the Wilderness Society was founded in the interwar period in response to the spread of roads in the national parks. “The modern wilderness movement was shaped more by a collective uneasiness with the enormity of change at a given historical moment,” he writes, “than it was by the emergence of a new scientific way of looking at nature.”<sup>104</sup> Noise pollution became an issue in and around RMNP in a similar context. Scientific or moral altruism was not at the core of the anti-air tour faction’s opinions. Rather, pragmatic, tourist-centric arguments became the impetus for protecting “silence” in the name of wilderness.

Conceptualizations of noise within the context of air tours in Estes Park bears further relation (though in divergent terms) to Sutter's thesis in its connection to automobiles. Not only was RMNP's wilderness defined by residents and park advocates as a space free of aircraft noise, but also a space accentuated with roads, providing democratic, unobtrusive views of the park's scenery.<sup>105</sup> Estes Park residents supported a view of wilderness in line with "a legacy of knowing nature through machines," as historian David Louter has put it.<sup>106</sup> While "wilderness" is defined by the Wilderness Act as roadless space, roads remained a central vehicle for understanding RMNP's natural resources. One explanation for the embrace of automobiles in the face of airborne nuisances is that Trail Ridge Road, the main auto-conduit built for experiencing the park, had become its own attraction by the latter decades of the twentieth-century. Always considered an engineering marvel, the Estes Park Chamber of Commerce aggressively promoted Trail Ridge as a cultural resource in the 1980s. The road celebrated its fiftieth anniversary in 1982, the same year noise pollution first became a tangible issue in RMNP. Brochures produced around this time described driving Trail Ridge and other roads as historical experiences in and of themselves.

Trail Ridge Road was painted as the preeminent vector through which the park should be experienced, while roads like Fall River Road, Trail Ridge's predecessor, was cast as a challenging, "real mountain trail." Instead of juxtaposing Trail Ridge with hiking trails, it was more immediately compared to an exciting if antiquated automobile route.<sup>107</sup> RMNP's status as a home to dramatic vistas was heightened specifically by the roads that framed that scenery. Not only did roads help visitors "create a relationship with nature" in the park, as Louter would argue, they had also come to embody cultural resources.<sup>108</sup> Automobile noise, which was and is conspicuous in and around the park's roads, was acceptable as a by-product of RMNP's "heavily traveled highway to the sky."<sup>109</sup> Cori Knudten argues that a drive along Trail Ridge Road provides

visitors with a quasi-summitting experience, enabling a quick and relatively safe way for people to experience dramatic verticality and the park's vistas.<sup>110</sup> Anti-overflight activists argued that aircraft noise would interrupt these auto-centric experiences, asserting that certain carbon-belching technologies belonged in RMNP while others did not.<sup>111</sup>

RMNP's overflight issue came to a head in the mid-1990s. Local groups like the chamber of commerce and the Estes Park chapter of The League of Women Voters fought to create legislation that would permanently ban commercial air tours at RMNP. Though grassroots appeals against air tour companies had so far kept air tour operations out of the area, a mid-1990s influx of prospective tour companies inspired local actors to seek a permanent ban. For the first time, anti-overflight activists explicitly tied noise pollution to the Wilderness Act, arguing that areas declared wilderness constituted ninety-two percent of RMNP, and that "these wilderness resources are particularly susceptible to noise from such motorized sources as aircraft."<sup>112</sup> Abstract concepts like "tranquility" continued to be defined in more concrete terms. Aircraft noise was considered especially bad because it affected park-goers in both frontcountry and backcountry areas. Aircraft produce an imperialistic type of noise, noise that cannot be readily escaped from or dampened by those experiencing it. At least automobile noise could be channelized, its presence emanating from roadways but nowhere else.<sup>113</sup> Even the Estes Park Chamber of Commerce, which had been foundational in the ultimately failed attempt at building an airport in Estes Park in the 1960s, supported the overflight ban. The chamber even denied air tour companies from applying for membership, a rare stance for any chamber of commerce to take.<sup>114</sup>

The air tour controversy brought about a renewed realization within Estes Park that the town's economic health was based in part upon silence. Air tours threatened "[s]olitude, tranquility, spectacular scenery, the opportunity to view abundant wildlife, and the dramatic

contrast to nearby urban environments” that attracted people to RMNP.<sup>115</sup> The chamber of commerce and other groups acting in the mid-twentieth century perhaps did not perceive natural quiet as part of RMNP’s appeal. But surely urban growth in the surrounding area during that period, as well as urban-style development in the park via Mission 66, introduced town residents to the sonic threats that the Great Acceleration presented. Air tours were banned in RMNP because local groups defined “tranquility” and “solitude” as vital features of the park that tourists sought out. Certain mechanical technologies were allowed to coexist within this context, while others were not. RMNP’s aircraft noise issues ultimately serve as an example of local stakeholders defining wilderness on their own pragmatic terms.<sup>116</sup>

### *Noise as Part and Proxy of the Great Acceleration*

Citizen groups that banned overflights in RMNP proved that local, grassroots advocacy could have tangible effects upon how wilderness is defined and perpetuated in the national parks. Noise pollution in general and the specific nature of the noise-related tensions that arose in RMNP and Estes Park are also indicative of wider changes inherent to the Anthropocene, and more specifically, to the Great Acceleration. Connecting RMNP’s changing soundscape to the Great Acceleration not only lends wider relevance to the issue of noise pollution in the park, but it also provides a model for articulating the history of the Anthropocene. Crutzen, Steffen, and McNeill note that an exceptional increase in levels of atmospheric carbon dioxide is the primary quantifiable characteristic of the Great Acceleration. Carbon dioxide levels can indeed be graphed and illustrated for readers, but those changes are for the most part intangible to people. Humans do not experience atmospheric carbon via the senses. Writer Patrick Hamilton argues that people are willing to accept the notion “that humans now surpass natural processes in driving global

change,” but change on a geologic scale is illegible in the material world. To most people, today’s “exceptional circumstances are merely the only reality they have ever known.”<sup>117</sup>

Noise can provide a visceral conduit for experiencing the proliferation of fossil-fueled, mechanical technologies that are inherent to the Great Acceleration. Furthermore, when noise pollution is interwoven with the Anthropocene, historians can begin to see how human institutions have both reacted to and bolstered the Great Acceleration. Both the NPS and FAA functioned as arms of a modern, centralized, twentieth-century state that manages and consumes natural resources at rates never seen before in history. The NPS and FAA may appear far from similar, but both agencies organize public space and provide infrastructure that has bolstered the post-1950 explosion in fossil fuel consumption.

Mission 66 was a response to problems specific to the national parks, but it was also part of a larger, national movement that facilitated increased auto transportation. Congress created the mechanism for building the interstate highway system in 1956, the same year that Mission 66 was legislated. Thus the problem of urbanization within the parks was rooted in a wider integration between the parks and a burgeoning network of highways which spread across the country. The material change wrought by this growing web of roads included the spread of mechanical noise that emanated from cars, as well as the spread of concrete and petroleum-based asphalt. At the core of this transportation transformation was cheap gasoline. A gallon of gasoline cost as much as \$2.60 (adjusted for inflation to 2013 rates) in the midst of the Great Depression. By 1956, however, the average price had fallen to \$1.93 per gallon and continued to fall until the oil crises of the mid-1970s.<sup>118</sup> In many ways, inexpensive oil is at the heart of the Great Acceleration. The increase in both noise and atmospheric carbon can be traced to the accumulation and spread of fossil-fueled machines from World War II forward.

If Mission 66 was a response to this accumulation of automobiles, it in turn facilitated even more automobile use, notably in the parks. As the Great Acceleration continues, the problems that machines like aircraft and automobiles pose to parks like RMNP multiply. Noise was and continues to be a threat to the solitude that people seek when they enter a space that they expect to resemble “wilderness.” Now, researchers have found that “Nitrogen compounds from power plants, automobiles, and agriculture is creating air pollution that is changing the alpine vegetation in Rocky Mountain National Park.”<sup>119</sup> Floral and climatological change in the park is being created by the same fossil-fueled technologies that transformed RMNP’s soundscape in the postwar era. Noise can thus be seen as an intruder that is in many ways parallel in nature and intimately connected to threats posed by nitrogen deposition and rises in atmospheric carbon, hallmarks of the Anthropocene.

The changes to RMNP’s soundscape that align with the Great Acceleration were not only experienced as external nuisances, as negative by-products of cars and planes. Mission 66 also reshaped oral interpretation of the park. One of Mission 66’s goals was to funnel visitors and their cars in and out of the park as quickly as possible. Facilitating this meant installing automated vocal interpretations of RMNP’s natural resources. This concept was further implemented from the late-1970s onward as private companies began offering cassette tapes that would provide oral interpretations of the park as visitors drove RMNP’s roads. Coined “Guided Tours of Rocky Mountain National Park,” these cassette’s offered “the complete story of the Rockies with legends, history, fascinating facts, music and sound effects...enjoyed in the comfort of your own car...at your own pace.”<sup>120</sup> These schemes both bolstered the park’s auto-centrality and further integrated RMNP into a capitalist, consumption-based economy. Historian Emily Thompson argues that the development of the “modern soundscape” of the twentieth century—rooted in electrical-acoustic



“signals” which spread information via sound (stereo systems, radio, etc.)—was in part meant to demonstrate humans’ technical mastery over the environment.<sup>121</sup> A cassette player that mediated RMNP’s sonic environment for visitors, facilitating the artificial partition that automobiles create between humans and the natural world, is an example of this technical mastery.<sup>122</sup> These streamlined communication technologies not only mediated and internalized wilderness for visitors to RMNP, but were also at the core of the globalized economic changes that swept the world during the Great Acceleration. Wilderness in RMNP was mediated in new ways through these technologies, and at the core of that newfound form of mediation was an altered relationship between visitors and the park’s soundscape. People began to experience the park’s sounds through a prepackaged stereo filter. An automated wilderness experience also economized park visitation. Automation meant that the park’s roads could move cars through RMNP at a machine-like cadence. Through Mission 66, a coldly rational, ever-moving modernity that was embraced in post-WWII America found its way into the national parks.

The FAA is another child of the Great Acceleration that is a central actor in contemporary noise pollution concerns, and which has a history that can be better understood when we utilize the Anthropocene as a tool for understanding the past. The administration embodies the acceleration of fossil fuel consumption, the growth of government bureaucracies that provided the framework for increased consumption, and the postwar explosion in long-distance tourism that are all facets of the Great Acceleration. Formed in 1958 and formerly known as the Civil Aeronautics Authority, the FAA was founded in anticipation of the jet-age, as well as in response to a number of midair collisions between commercial and military aircraft that occurred in the early-1950s. Imbued with the authority to create a uniform system of air navigation which would govern the United States’ airspace, the FAA rendered American skies safer and more navigable. Undergirded

by rationalized skyways, commercial air transport took off. Historian Jenifer Van Vleck has noted that air travel was a catalyst for the United States' global ascendancy in the twentieth century, arguing that the United States, through international air travel, created a form of empire that was extraterritorial and rooted in commerce and capitalism. In Van Vleck's words, as commercial aviation became more prevalent in the mid-1900s, "few places remained far from Wall Street and Washington."<sup>123</sup> The world shrank thanks in part to the FAA, which facilitated not only the consumption of fossil fuels via aircraft, but also catalyzed the growth of a globalized economy of resource extraction.

According to Vaclav Smil, emissions from jet engines only account for about two-percent of global anthropogenic emissions of carbon dioxide. Yet aircraft emissions inordinately exacerbate global climate change because emissions occur in the upper atmosphere. More importantly though, jet engines (along with diesel engines) are a prime mover of globalization and thus have been integral to the global economic regime that supports the Great Acceleration. Smil notes that world merchandise exports were valued at \$60 billion in 1948, but by 2003, they were valued at \$7.4 trillion. Over the same span of time, global air travel multiplied 123 times.<sup>124</sup> Alongside diesel engines, jet engines have done "virtually all of the work of modern globalization," a process which coincides neatly with the Great Acceleration.<sup>125</sup> The Anthropocene is a tool for vetting this global program of modernization, and in many ways it counters the positive effects of that program. The aircraft noise over RMNP that incited pushback from local residents and advocates of the park was an artifact of that process of modernization, which not only spread jet engines into the world's skies, but also inspired the creation of vast governmental bodies like the FAA, which could manage formerly ephemeral airspace and facilitate a globalized system of travel and resource extraction.

Much like its commercial counterpart, the United States' general aviation fleet rapidly grew following the Second World War. Numbered at 37,000 in 1945, by 1969 private aircraft numbered 130,000. These planes and helicopters labored in myriad ways, dusting crops, rescuing lost hikers, and facilitating new tourist experiences.<sup>126</sup> But some general aviators lamented the FAA and the rationalized, high-modern airspace that it produced. In part, these flyers were dismayed by the threats that the agency posed toward “visual flight rules” (VFR). Remaining the norm through the mid-1950s, VFR flying—which meant that, on clear days, pilots could theoretically fly across the continent without ever contacting an air traffic controller—was disposed of by the FAA. General aviators viewed VFR as a testament to the freedom of the skies. But such unregulated flying became incredibly unsafe as jet aircraft pushed speeds and grew in number. Beginning in the 1960s, the FAA implemented automated air traffic control systems rooted in the widespread use of radar, transponders, computers, and a host of portable electronic equipment, technologies which became ubiquitous with flying any aircraft, small or large. Such developments made airspace legible and therefore more exploitable for the fossil-fueled machines which were cluttering the postwar sky.<sup>127</sup>

In many ways, the FAA's control over airspace in the latter half of the twentieth century mimicked the imperial nature of aircraft noise. The agency was and is granted full control over American airspace. Specifically in RMNP's case, the FAA was reluctant to cede that control to the citizens of Estes Park or the NPS. New technologies, cheap fossil fuels, and postwar Americans' desire to travel had demanded the creation of the FAA. But the RMNP air tour controversy proved that the federal government was ill-equipped to mediate conflicting demands between the NPS, which was interested in fostering a certain soundscape, and the FAA, which sought the continuation of unabridged access to American airspace. “The skies above the parks are

not managed by parks,” writes Garret Keizer. “All commercial airspace in the United States is governed by the Federal Aviation Administration, which has a reputation for safeguarding both its regulatory prerogatives and what is often referred to in aviation parlance as ‘the freedom of the skies.’”<sup>128</sup> Indeed, the FAA was unconvinced that air tours would create a detrimental amount of noise in the park. While the agency did propose the possibility of an outright ban on overflights, they requested further study into the effects aircraft noise would create before such a ban was enacted.<sup>129</sup>

This is not to say that the ways in which the NPS has handled noise pollution and the preservation of soundscapes does not also warrant criticism. Controversy related to noise pollution in RMNP and other parks in the latter decades of the twentieth century not only inspired the air tour ban in RMNP, but also led to the establishment of the Natural Sounds and Night Skies Division of the park service. The division is tasked with monitoring, understanding, and protecting sound resources in the parks.<sup>130</sup> The NPS divides sound resources into two categories—“cultural sounds” and “natural sounds.” Cultural sounds include cannon fire at historic battlefields, for instance, while natural sounds might include elk calls and the roar of cascading water. These are very stark divisions that arguably blur together in many ways, and RMNP is a perfect context for unpacking this natural/cultural sound dichotomy. The NPS states explicitly the value that “elk bugling in the cool autumn air of Rocky Mountain National Park” lends to the park’s wilderness character.<sup>131</sup> Yet the elk in RMNP are only present and able to bugle because they fit an idealized vision of Rocky Mountain wilderness. Elk were hunted to extinction in the RMNP area in the late nineteenth century and were only reintroduced beginning in 1913. The din of internal combustion engines would have entered the Estes Park area around the same time that elk bugling returned, both championed by human decisions. Yet one is a “natural sound,” the other cultural.

The NPS also rationalizes the management and protection of natural sounds because they are vital aspects of a healthy ecosystem.<sup>132</sup> Elk and other animals use vocalizations to mark territory, as well as to alert one another of threats. Yet, were not the bears and wolves historically native to the RMNP area also integral parts of that local ecosystem? They did not fit the tepid and tourist-friendly wilderness that park promoters desired to create during the twentieth century, so they were eliminated. This lack of predators has contributed to the ubiquity of elk bugling in RMNP, but it has also worked to harm the park's larger ecosystems. RMNP has long struggled with oversized elk herds, which overgraze and can harm willow stands and riparian areas.<sup>133</sup> Elk bugles in RMNP do not just represent raw, untamed wilderness, but also the human values and decisions that have dictated the construction of such an elk-friendly environment. And what of automobile noise? If Trail Ridge Road is to be couched as a cultural resource in and of itself, an image of the road that anti-air tour activists sought to create, then the inevitable mechanical noise produced by vehicles traveling the route speaks to the culture that has created and maintained the park. That culture accepts and even promotes a synergy between wilderness and urban-industrial infrastructure and technologies.

Human inputs—whether they be automobile noise or elk—continue to reshape both material realities and definitions of “wilderness.” Fossil-fueled technologies not only create by-products that physically transform the biogeochemical world, but they also are vectors through which we mediate and understand that natural world. Noise pollution in wilderness areas is an intriguing proxy that can help us better understand what wild places look like in an era where human outputs shape all facets of the Earth system. Before modern society's exhaust began to alter alpine vegetation in RMNP, it was reshaping local soundscapes and stripping wilderness of its natural tranquility. Sensory history provides a framework through which historians can better

understand these local environmental changes wrought by a global proliferation of carbon-consuming machines.

### *Conclusion*

Soundscapes constitute more than a set of baseline decibel readings. Rather, humans conceive of and define a locality's soundscape, and then attempt to perpetuate that soundscape based on a set of value judgments. How different sounds became defined and valued in the context of RMNP's air tour ban reveals this. On a wider scale, changes to local soundscapes can help heighten our sense of global change. Humans should strive to perk their ears to the mechanical noises that have been increasingly normalized—the music we are bombarded with in grocery stores, the perpetual hum that leaks from HVAC systems, the drone of aircraft. The social and economic regimes that have created these incessant noises are all in some way connected to the mass-production and -consumption of goods that is a core tenet of the Great Acceleration. Pragmatic approaches to local issues like noise pollution can help illuminate the material changes that this era has wrought. At the very least, it is a signifier of global change that people can relate to at a visceral level, more so than melting polar icecaps and warmer temperatures. “Make a list of the loudest or most prevalent noise sources in our world: airplanes, automobile traffic, weaponry, power tools,” writes Keizer. “Almost every one of them has to do with reducing time, space, or labor.”<sup>134</sup> This expectation of mechanized help is a cultural more of the Anthropocene, and is prevalent in and around RMNP. The increased movement of goods and ideas that stand at the core of the Great Acceleration have created an unprecedented amount of noise on our planet. Often those noises signify instances where anthropogenic climate change is advanced. Identifying this provides new avenues for experiencing the Anthropocene day-to-day, forcing us to reconsider the Western world's absolute adherence to modernization-via-technology.

Noise pollution can also inform policy makers about how environmental change has been fought legally in the past. “Telling people what they should be worried about is a nonstarter,” argues environmental humanist Paul Robbins. “Asking people what they're worried about and then thinking about how environmental science and environmental studies connect to those anxieties – that's a much smarter thing to do.”<sup>135</sup> Soundscapes are a portion of the environment that people absolutely care about. Especially in the postwar era, laws pushing back against the proliferation of noise in urban areas have been legislated across the Western world.<sup>136</sup> The problem of noise raises difficult questions for those concerned about the national parks and other wilderness areas specifically. Can wilderness continue to exist in RMNP, in a world where everything is shaped by humans? Within the context of the park, RMNP administrators seemed to understand that this was a problem during the latter part of the twentieth century. “We’re loved to death,” said resource specialist Edgar Menning in 1980. “We’re supposed to be an outdoor museum. What we have is an urban park.”<sup>137</sup> And the fact that noise laws needed to be implemented in and around RMNP suggests that urbanization had consumed the park by the 1980s. But RMNP’s noise issues also provide pragmatic ideas for how to approach wilderness and conservation in the Anthropocene. The activists who ultimately banned air tours from the park did not have an extreme view of what wilderness might entail. Cars were allowed, for instance. Indeed, they were and still are the primary vector through which RMNP’s wilderness characteristics are revealed to visitors. Thus people have been shaping the definition of wilderness for decades, in order simultaneously to protect it and render it accessible. In this sense, there is already a history of humans identifying and mediating components of the Anthropocene. Continuing to search for this history is one way in which historians can help to provide practical strategies for understanding and protecting wilderness and nature in a volatile, no-analog world.

## Chapter II: Globalizing Hidden Valley

Hidden Valley Ski Area's first director, George Hurt, was in many ways forged by the American military. A member of the famous Colorado-based 10<sup>th</sup> Mountain Division, Hurt fought in Italy during World War II. Shot through the lungs in the Po River Valley, he could have easily died, and Rocky Mountain National Park's ski resort may have never come to fruition. Hurt survived, though. Trained by the Army to ski in combat zones, Hurt returned to his hometown of Estes Park, and began operating the rudimentary ski area at Hidden Valley. A timbered basin due east of Estes Park, located within park boundaries and girded by Trail Ridge Road on the north, south, and west slopes, the highest of the valley's walls reach above timberline to 11,400 feet, while Hidden Valley Creek bisects the basin, meandering toward the northwest.<sup>138</sup> Despite the presence of patchy, wind-packed snow, which is endemic to the eastern slope of the Rockies, locals like George Hurt managed to scrounge out a successful living running the ski area in the valley.

Indeed, it was through the Great Acceleration—via cheap fossil fuels and the many machines that consumed them—that Hidden Valley Ski Area and modern skiing in Colorado became feasible. The technologies that carried Hurt to the Po Valley—diesel engines, plastics, and synthetics—were produced at astronomic rates during World War II, and they proliferated around the world, into civilian markets and public lands, following its end. Hurt purchased reclaimed military surplus engines to power Hidden Valley's first rope tows, and nylon—produced by chemical giant DuPont and used in Allied parachutes—quickly found its way into skiers' clothing.<sup>139</sup> Interstate highways designed in the face of Cold War threats carried skiers to formerly isolated slopes, and jet engines, borne of the global conflict that nearly killed George Hurt, carried outdoorsmen and their increasingly technologized equipment across continents and oceans.



Shaped by a political climate where nations looked to commerce in hopes of preventing another conflagration, modern skiing came to RMNP on the back of a global economy that moved mountains and transformed climates.

Hidden Valley, with the blessing of then NPS director Conrad Wirth, opened as a ski resort in 1955. The 1950s were not yet the glory days of skiing on the slopes of posh mountain towns, though. “Skiing enjoyed its most rapid growth when it was full of brutal discomfort,” writes skiing historian John Fry. As Fry recounts, the early decades of the twentieth century and those immediately following the end of WWII were a time when skiing equipment was directly modified from organic materials. Skis molded from ash timber were liable to break and could quickly become saturated and heavy with moisture. Leather boots constantly shrank and expanded, their fit thrown in flux by the extreme environmental conditions to which skiing exposed them to. Skiers who wanted a respite from the cold often had to gather in rudimentary wooden shacks filled with smoke that rose from wood-burning stoves. In short, skiing’s organicism was often a serious source of discomfort.<sup>140</sup>

This is not to say that the wool and cotton that dominated slopes in the 1940s and early 1950s were divorced from the world’s modern, carbon-rich infrastructure. Tourism to RMNP had always been rooted in gasoline-powered automobiles, and by the latter decades of the nineteenth century, farmers, ranchers, and market hunters had begun to exploit new portions of the American West by way of coal-powered locomotives.<sup>141</sup> Leather boots and wooden skis may have been fashioned by skiers from scratch, but more likely they too first found their way to Hidden Valley via fossil-fueled machines traveling to and from industrial centers. But fossil fuels and their derivatives were beginning to reshape both skiing and the national parks in an accelerated form

that would transform Colorado's mountains into spaces of sport and leisure, places consumed by middle- and upper-class families energized by the carbon-richness of the Great Acceleration.

Just as cheap coal and gasoline facilitated the spread of noise in and around RMNP, it also undergirded a revolution in the development of plastics and other synthetic materials. Skiers replaced wool leggings, wooden skis, and leather boots with plastic and space-age synthetics like Gore-Tex. These innovative materials, developed by companies such as DuPont, represented the technocratic, federally-subsidized chemical industries that drove both modern American consumerism and the Great Acceleration. Ski resorts like Hidden Valley would also seek out inorganic energy technologies that would, in effect, circumvent the valley's verticality. Beginning with rope tows energized by repatriated automobile engines, ski resorts in Colorado and other western states searched the globe for affordable lift technologies, all of which were powered by fossil fuels. There was a time when skiers used their own human muscles to climb the slopes they skied upon. But increasingly, machines came to labor for skiers. The postwar explosion in ski resorts located in the western United States—an influx which Hidden Valley was a part of—was fueled by a period of carbon richness that has been but a mere moment on the scale of geological time.<sup>142</sup>

The Anthropocene is a conceptual tool that allows historians to move between temporal scales, from the relatively short history of recreational skiing and its adoption of synthetic materials, to the deeper history within which fossil fuels—the energy that skiing's modernization was founded on—are embedded. Skiing is threatened by global climate change like few other recreational ventures. Historian Andrew Denning has written about the effects that climate change might have for ski resorts in the Alps, and other scholars have outlined the problems that might plague ski areas stretching from Sweden to New England.<sup>143</sup> Humans have traditionally

experienced climate in a low-variance environment. Yet this period of climate stability, which modernity has in part been founded upon, seems to be coming to an end. Humans are the primary agent of that global change. With this in mind, how has our modern abundance of fossil fuels undergirded modern skiing in Hidden Valley and elsewhere? The localized use of fossil fuels in the twentieth century, done in the name of recreational skiing's growth, played an incremental part in fomenting global climate change. Modern skiing's rise, and the founding of Hidden Valley Ski Area, both coincide with the Great Acceleration. Indeed, they are a part of this most recent period in the Anthropocene.

If the Anthropocene can be a tool for scaling temporally, then it also can be used to conceptualize broad spatial scales. How have humans consumed natural resources across vast spaces, and what are the energy and technological systems that have reinforced modern, post-WWII styles of consumption? Modern recreational skiing—with its reliance on polyethylene and petroleum—is founded on a complex marriage of private, technologized corporations and modern nation-states. State agencies and private companies worked together to harness and consume natural resources at levels never before seen in the history of the planet. We live in the world that they created, and the skiing industry has roots in this Cold War-era technocratic marriage of public infrastructure and private innovation. DuPont, for instance, worked closely with the United States government on nuclear weapon projects at the same time that it was perfecting materials like nylon and Gore-Tex. These materials became central to skiing in Hidden Valley, and today they are essential accoutrements for citizens who want to hike or camp in wilderness areas situated in parks like RMNP. “In the Anthropocene,” argue Clive Hamilton, Françoise Gemenne, and Christophe Bonneuil, “social, cultural, and political orders are woven into and co-evolve with techno-natural orders of specific matter and energy flow metabolism at a global scale.”<sup>144</sup> The modern skiing

industry was borne out of a globalized economy that transformed extreme geographic spaces such as granite mountaintops into places of postindustrial consumption. From the technologies that insulated bodies in high-altitude climates, to the machines that pulled those bodies up mountainsides, that process was dependent upon fossil fuels.

Hidden Valley Ski Area operated in RMNP from 1955 until the early 1990s. As a space where fossil fuels and synthetic materials were consumed in an outdoor, recreational context, Hidden Valley is illustrative of how carbon-rich technological and energy systems made their way into places that are often celebrated as wild. Yet the ski area did in fact close down, the primary reason being that it did not fit with the NPS's values, nor its legal mandates. Hidden Valley is also illustrative, then, of changes in Americans' environmental ethos, changes which took hold over the course of the second half of the twentieth century. In the eyes of the park systems and many twentieth-century Americans, the ski area was too artificial and industrial and could not remain operational in RMNP. But the wilderness area which has replaced the ski resort is also primarily experienced by humans who tap into an industrialized and technologized economy, procuring nylon tents and Gore-Tex jackets. Such materials have become essential to the execution and perpetuation of Leave No Trace wilderness ethics, and I will examine these contradictions and their relationship to both the history of RMNP and the history of the Anthropocene in the last section of this chapter.<sup>145</sup>

Hidden Valley remains a site of nostalgia, especially for those residents of Estes Park and of north central Colorado who are old enough to remember skiing there. Their stories, which occurred in a highly localized context, are essential to understanding the story of the Anthropocene and its ties to Hidden Valley and to RMNP. Undergirding local memories are the technologies and social systems that created new material contexts in the post-WWII world. It was days spent in

Gore-Tex jackets strapped to plastic skis, individuals' rides on rope tows and chairlifts, and the parallel accoutrements that currently facilitate wilderness recreation in Hidden Valley that animate the Anthropocene and its connections to modern skiing and tourism in RMNP. Americans living in the Great Acceleration have not just experienced the passive, inanimate benefits of living amidst a carbon-rich globalized economy. We also experience a form of hydrocarbon nostalgia, invoked in recollections of car trips, plane rides, and even harrowing journeys lashed to diesel-powered rope tows. The Anthropocene is a cultural moment as much as it is a material one, and it has worked its way into RMNP, Hidden Valley, and the memories of those who have frequented those places.

### ***Climate Control: Skiing, Comfort, and the Great Acceleration***

Skiing in extreme environments like the Rockies requires a certain level of “mastery” of the terrain and climate in relation to a person’s body. Historian Rachel Gross has examined outdoor recreation apparel and how postwar Americans utilized synthetic materials like Gore-Tex to “define their identity through consumption.”<sup>146</sup> Material changes to the skis that skiers strapped to their feet and the jackets that kept them warm led to cultural changes in how outdoorsmen identified themselves as expert visitors to extreme environments. But these materials also rendered slopes more accessible and represented new modes of production that are important to understanding the Great Acceleration. Skier Bill Tanler, writing in 1989, noted that by the latter decades of the twentieth century, “the highest quality and most effective skiwear on the market [had] its beginnings in the lab, not on the back of a sheep.”<sup>147</sup> Synthetic overcoats and plastic boots replaced wool and leather, and the ways in which these objects were produced and the scales upon which they were consumed are illustrative of postwar leaps in fossil fuel dependence, global capitalism, and technocracy, all of which are important components of the Anthropocene. Skiers,

operators, and NPS employees familiar with Hidden Valley Ski Area referred to these technological changes, though often implicitly. The inception of plastic skis and nylon jackets embedded Hidden Valley in an increasingly technologized, carbon-energized global economy that was cause and consequence of the Great Acceleration.

Originally made of wood, after World War II skis gradually began to be manufactured with steel, fiberglass, and eventually plastic. The first skis that utilized synthetic materials began to become popular on the market in the 1950s and 1960s. These skis were not purely plastic or fiber glass, but rather they were conglomerations of wood, steel, and fossil fuel-based composites. Writing in 1980, skiing historian Ted Bays recalled that “Not until contemporary science concocted a synthetic cement (polyethylene) that glided well, and hid the steel edge in complex laminations, did the advantages of steel and synthetics become perfectly joined.”<sup>148</sup> Such technological advances rendered skiing easier and safer, and by extension, more marketable and accessible to a wider range of people. But these advances also represent the forging of new relationships between people and the natural world. Early skiers in Hidden Valley may have fashioned their own skis from local aspen or pine, perhaps even utilizing timber harvested directly from Hidden Valley. But postwar skis, which utilized complex materials like plastic, were thoroughly modern, and according to historian Jeffrey Meikle, “bore witness to a dominant technocratic mentality of precision and efficiency.”<sup>149</sup>

RMNP has preserved artifacts that illustrate the material changes that undergirded the differences between modern skiing and its earlier, more conspicuously organic era. Two sets of skis are currently retained in RMNP’s archives. One set is entirely wooden, save for simple leather bindings that would have strapped a late-nineteenth- or early-twentieth-century Coloradoan to his or her rudimentary planks. There are no markings that denote a place of production or sale. The

wooden skis maintain an artisanal, pre-consumerism feel. Lying beside this set of early skis on the archive's storage shelves is a pair of Kazama brand skis, likely from the 1970s or 1980s. Painted red, white, and blue, the Kazama skis bear the markings of the capitalistic, globalized, energy-intensive world from which they came. A fusion of plastic, wood, and fiber glass, these skis are marked with bar codes, evidence of the highly-rationalized consumer society which made them. The Kazama skis are also clearly marked as "Made in Japan," indicating the skiing industry's post-WWII global reach. Plastics, materials that researchers have recently discovered can fuse with molten rock and be preserved across millennia, are compelling material markers of the Anthropocene.<sup>150</sup>



*Wooden ski contrasted with modern composite ski, both found in Rocky Mountain National Park. Photo by author. Courtesy of Rocky Mountain National Park Museum and Archives.*

It is worth dwelling on the components of the Kazama skis. Subsumed in the six-foot-long modern skis are material ties that bind together Japan, the Middle East, the Pacific Northwest, and RMNP; connections which illuminate the Great Acceleration's place in shaping the park. Likely

constructed with a wooden core, the Kazama skis do, in that sense, retain some material semblance to the amateur-made skis that preceded them. The similarities stop there, though. The antiquated pair of skis were likely constructed from trees within or around RMNP's eventual boundaries, where their owner likely lived. Conversely, the wood that constituted the core of the Kazama skis likely crossed the Pacific twice in its lifetime. While Japan is a heavily timbered country, its postwar modernization forced excessive demands upon its domestic forests. As a result, by 1970 Japan was importing more timber than it produced; that trend only increased throughout the decade. By 1980, Japan imported, primarily from the Pacific Northwest, over 48,000 cubic meters of timber. In contrast, the country only produced 34,000 cubic meters in 1980.<sup>151</sup> The modernization of Japan threatened to exhaust the domestic wood supply, but it also facilitated strong trade ties with the United States and Canada, which acted as important banks of timber. Thus, through a global network of fossil-fueled commodity chains, Japan could have its cake and eat it too. The wooden cores of modern skis could continue to be fashioned, even if those cores originated in Oregon, Washington, or British Columbia. Those skis could then be sold to retailers in the U.S., and procured profits could be utilized by Japan to continue funding its modern economy, perhaps through reinvestment into its flourishing auto or electronics industries.

Coal and oil fueled the technologies produced by modern, globalized companies like Sony, Toyota, and Kazama, corporations that fueled Japan's deforestation. Petroleum, specifically, not only fueled the machines that carried the Kazama skis and their component parts across oceans. Petroleum was also literally embedded in the skis in the form of plastic. Japan's timber production was being eclipsed by imports in the 1970s and 1980s. Even so, its forests were much more secure than the country's oil supply. An island nation bereft of local petroleum reserves, Japan imported 99 percent of its crude oil in the mid-1980s. Sixty-five percent of that oil originated in the Middle



East.<sup>152</sup> Indeed, since the beginning of the Great Acceleration—which coincided with Japan’s Western-led modernization—Japan depended upon Middle Eastern countries for its petroleum supplies. This oil went into cars, ships, and even skis, highlighting the modern world’s carbon richness, and ultimately its environmental debts, now being enacted in the anthropogenic transformation of the Earth system.

The Kazama skis suddenly appear even further removed from their ancestral counterparts. The earlier pair would have been produced locally, and likely for practical purposes. Skis and snowshoes were the easiest way to traverse Colorado’s highlands in the years before interstates and snowplows. Enos Mills—a famous naturalist who championed RMNP’s founding in the late-nineteenth and early-twentieth centuries—used skis to trek through the Front Range when he worked as a snow observer for the State of Colorado.<sup>153</sup> On the other hand, the Kazama skis were produced for sport, and for fashionable consumers (evidenced by their bright color scheme). This was a different form of skiing, one that tapped into global commodity chains, fossil fuels and their attendant technologies, creating a consumerist culture that made memories out of hydrocarbon abundance. Both pairs of skis were buried in the snows of Hidden Valley, their differences illuminating how RMNP became integrated into a larger world during the Great Acceleration.

The modern, post-1945 skiing industry’s ties to specific engines of the Anthropocene are also clearly seen through its connections to chemical engineering companies such as DuPont. Engineers at DuPont were responsible for inventing both nylon and Gore-Tex, two synthetic materials that became integral to skiing in the postwar era. DuPont used profits from popular materials like nylon to support research on Cold War-era weapons systems. They were a central player in early efforts to produce the hydrogen bomb, for instance. According to historian Pap Ndiaye, DuPont’s innovations played an important role in the postwar United States’ “steep rise

in mass consumption and the building of the notorious ‘military-industrial complex,’” both fomenters of the Great Acceleration.<sup>154</sup>

Nylon, invented in 1935, was DuPont’s most famous innovation, especially once it was utilized in the production of pantyhose. Durable yet elastic, endlessly pliable, and seemingly exempt from natural laws, nylon—much like plastic—“symbolized a new way of life, the future, the spirit of America and its mythical modernity.”<sup>155</sup> Nylon became an important material to the American war effort during World War II. By the end of the war, nylon was present in a number of consumer goods, and skiers and outdoor enthusiasts began to utilize Army-surplus nylon on the slopes and along the trail. By the 1950s and 1960s, skiers began sporting nylon wind jackets, which were waterproof, unlike their wool counterparts.<sup>156</sup> By the 1970s, the outdoor recreation retailer REI marketed seven different kinds of nylon which were used in their products.<sup>157</sup> Throughout this twenty-plus-year period, DuPont and other chemical companies flourished globally. Undergirded by nylon’s success, DuPont’s net sales increased almost six times over and their net income tripled.<sup>158</sup> Through synthetics like nylon, DuPont inserted itself in an array of consumer industries, from hosiery to skiing to national defense. Its growth was not only represented in capital returns on investment, but also by the consumption of natural resources and of geographic space. The company helped energize a globalized economy that was not only powered by fossil fuels, but which also molded hydrocarbons into useful everyday goods.

Space Age synthetic materials represented the technological ideals of modern America. They also represented sprawling chemical industries like DuPont, which with the help of a fearful, Cold War-era American government, consumed resources and produced new materials—from plastics to pesticides to nuclear warheads—that would become hallmarks of the Great Acceleration. The successful detonation of the world’s first atomic weapon in 1945 irradiated the

Earth's atmosphere with a layer of radionuclides, "a layer which will act," according to Hamilton, Bonneuil and Gemenne, "like a flashing light for geologists of the future" whose job it will be to explain the onset of the Anthropocene.<sup>159</sup> Chemical companies like DuPont were in part responsible for creating this hallmark of the Anthropocene. Increasingly, these chemical companies inserted themselves into the world's day-to-day economy, becoming a player in growing consumer markets, including the burgeoning skiing industry.

It was innovations like nylon, and later, Gore-Tex—discovered through a DuPont engineer's home experiments—which made skiing increasingly safer and thus accessible to a wider array of consumers. Complex, technocratic producers like DuPont reshaped how skiing equipment was made and marketed. Bill Tanler noted this shift in 1989, writing, "Unlike most items of ski equipment, which, over the years, have been developed by individuals (usually on a shoestring), the plunge into technical products that form the basis of the current high tech variety of skiwear was made by major companies with the resources to develop complex materials."<sup>160</sup> DuPont's various technical ventures reinforced the postwar globalized economy that has reshaped the Earth's natural systems. Subsidized, fossil fuel-dependent scientific and technological mastery made both the bomb and the synthetic outerwear that environmentally-conscious skiers and outdoorsmen still wear today.

DuPont built massive chemical production factories in the United States during the early-twentieth century, notably at Old Hickory, Tennessee (the town was founded by DuPont) and in Camden, South Carolina. DuPont produced "orlon" in the South Carolina factory, the original name for synthetic acrylic fibers made up of molecules of carbon, hydrogen, and nitrogen. Orlon was one of the first synthetic materials to be used in clothing, and would have certainly found its way into midcentury skiing equipment. The factories in Tennessee and South Carolina consumed

energy and water in large amounts, and their sheer size attested to their industrial might. The Old Hickory plant—originally a munitions factory—covered 5,600 acres.<sup>161</sup>

DuPont's chemical innovations and those products' growing presence in skiing equipment grew substantially after World War II, but not without harmful externalities that never appeared in Hidden Valley or on the slopes of other ski resorts. In 1951, DuPont began purchasing perfluorooctanoic acid (PFOA) from its competitor 3M for use in the production of Teflon. By the 1970s, Teflon—a lubricant best known as a non-stick coating used in cooking—was becoming prevalent in ski bindings. Teflon pads inserted into bindings gave skiers more flexibility, reducing rigidity and friction between bindings and skis, allowing skiers to more safely release from their bindings. “Safer skiing is what it's all about,” one company stated when advertising its Teflon-coated bindings.<sup>162</sup> But the use of PFOAs in the production of Teflon was endangering humans, livestock, and wildlife even as it helped to protect skiers. DuPont, through its own private research, had known by 1961 that PFOA deformed the livers of lab animals. By the 1970s, when Teflon became commonplace in ski equipment, the company understood that workers at its Washington Works plant located in West Virginia were carrying large amounts of the chemical in their blood. DuPont's researchers eventually found that PFOAs had entered the groundwater surrounding the West Virginia plant. They also understood by the 1990s that PFOA caused birth defects as well as multiple forms of cancer. Yet all of this information was kept secret, locked behind DuPont's doors, obscured until local cattle raisers—long silenced by wary locals who depended on DuPont for employment—revealed the desiccated, malformed livers and brains that PFOA-polluted water had plagued their herds with.<sup>163</sup> Modern skiing—as well as cooking, the aviation industry, and modern medicine—are tied to the ailments and cancers that have afflicted citizens living near the

Washington Work's plant. It is these industries that created Teflon, and rendered it pliable in a multitude of places, from suburban kitchens to Rocky Mountain ski slopes.

During the twentieth century, DuPont also looked overseas to produce materials like nylon, an important component in sports clothing and a precursor to materials like Gore-Tex. By the 1960s, DuPont factories located in Northern Ireland, Brazil, Argentina, the Netherlands, and Japan were manufacturing Orlon, rayon, and nylon.<sup>164</sup> DuPont attempted to establish a nylon plant in Goa, India in the 1980s, but locals thwarted the opening of the plant. Citing DuPont's continued production of chlorofluorocarbons—which help to destroy the planet's ozone layer—as well as the company's use of leaded gasoline, local activists began to call for DuPont's departure. DuPont, with help from the Indian government, had bulldozed an entire plateau and bored multiple wells in preparation for plant operations. Eventually activists forced DuPont to admit that its nylon production process relied on poisonous chemicals, and after a series of violent popular upheavals, the company left Goa in the mid-1990s.<sup>165</sup>

DuPont, bolstered by its mid-twentieth-century profits and its successful entry into consumer markets, had become increasingly embedded in a global system of production and trade, as the Goa story attests. DuPont's environmentally dangerous actions in Goa—actions which continued throughout the 1980s and 1990s, as Bill Tanler wowed skiers with lists of space-age synthetics produced by the chemical giant—attests to the nearsightedness that the term “postindustrial economy” represents in the Anthropocene.<sup>166</sup> Hidden Valley's slopes became industrial, in a sense, whenever DuPont or another chemical company's products adorned skiers. That industry had simply been displaced to somewhere far from RMNP, and in this case, far from the United States. This physical distance between sites of production and their attendant social and environmental externalities are accompanied by an imaginative distance, whereby visitors to national parks, for

instance, can seemingly enter a benign environment where inequality and pollution are rendered nonexistent.<sup>167</sup> Such side-effects of industry had simply been removed to somewhere else, however.

Visitors to RMNP and skiers on Hidden Valley's slopes were in part facilitated by labor provided by faraway environments and distant human bodies. DuPont's role in weakening the Earth's ozone layer, its dependence upon hydrocarbon feedstocks, and its heavy use of fossil fuels in manufacturing processes, all represent its part in hastening the Anthropocene.<sup>168</sup> But its increased reliance on a globalized market of labor and environmental services (in the form of water, especially), as well as the commitment to fossil fuels that twentieth-century global transport required, implicates the company in a larger, more complex exploitation of the Earth's natural systems. Through DuPont, Goa, an Indian state that lies along the Arabian Sea, became interwoven with the history of a small ski area in northern Colorado, reconnecting the Front Range to its own industrial past in uncomfortable ways.



At one point in the postwar era, skiers and hikers had decried the rise of synthetics as engines of inclusion. In their eyes, such materials made traversing extreme environments too easy.<sup>169</sup> But by the 1980s and 1990s, materials like plastic and Gore-Tex were synonymous with skiing culture. Such materials rendered skiing accessible to novices, whose space-age jackets would insulate them from repeated falls and adverse weather that the average, non-mountain person was not used to suffering. Materials like Gore-Tex were also considered stylish for the modernity they represented. They were central objects in helping to transform postwar ski slopes into spaces where one could “display feats of consumption,” as historian Annie Gilbert Coleman has argued.<sup>170</sup> Materials like Gore-Tex embodied leisurely consumerism, replacing materials like leather and jeans, objects which connoted a more rugged, labor-centric relationship with the mountains. The modern mass production and consumption of synthetics has played a part in utterly transforming the planet which humans inhabit, while also reflecting the change in how people came to know the outdoors. No longer graced by the rough-hewn skis of jean-clad miners or timbermen, mountains like those that adorn Hidden Valley became vacation spots for suburbanites, who—due in part to their carbon-rich lives—could reimagine skiing as a sport.

Raised in an energized superstructure of pliable synthetics, modern Americans are, in historian Nancy Langston’s words, “saturated with industrial chemicals.”<sup>171</sup> From Tupperware, to industrial solvents, to food products like caffeine, synthetics became ubiquitous with day-to-day life in post-WWII America.<sup>172</sup> Chemicals like polyurethane and Gore-Tex were central to the development of modern skiing in the United States, including at Hidden Valley. Such materials encased skiers in a waterproof cocoon, allowing novices to safely and comfortably take to the slopes. They are also artifacts illustrative of the Great Acceleration, an era of mass production and consumption that promised the wellspring of modernity, but which has also left behind a

frightening legacy of environmental declension. Many Estes Park residents felt that Hidden Valley would inspire the further modernization of their town. “As a business woman of long standing,” declared Mayme B. Redman to the park in 1973, “I can truly say that Hidden Valley has boosted the economy of this area beyond belief. When I first came here there was no restaurant in winters; there was no movie house; there were no motels open in winter and practically everything we needed outside of groceries had to be ordered by mail order catalog or we had to go to one of the ‘valley towns’.”<sup>173</sup> Hidden Valley Ski Area had helped Estes Park’s residents manage often perilous winters by facilitating modern modes of living and consuming. For many, these economic considerations trumped arguments against the ski area, which detractors (who often did not live in the area surrounding RMNP) considered to be out of place in a national park, especially after the passage of the Wilderness Act in 1964. Rooted in a wealth of fossil fuels, postwar technologies had brought light, warmth, and mobility to the Estes Park area and to Hidden Valley, modernizing and winterizing the high-altitude village and its ski area. If modern skiing depended on synthetic materials to properly insulate individual skiers, it also depended on diesel engines and gas generators to pull those skiers up the slopes. Such machines energized the postwar world’s globalized economy, moving goods across seas and people up mountainsides, in turn hastening the Great Acceleration.

### ***Priming the Valley: Diesel-Powered Skiing in RMNP***

The park, from its inception, has been imagined and managed with automobile tourism at its core. Cars play an important role in the physical design of the park, as well as in defining its value to American culture through resources such as Trail Ridge Road. Internal combustion engines became integral to Hidden Valley Ski Area’s operation as well. The resort’s early rope tows, which whisked skiers to the highest edges of the half-bowl so they could ski down into the



valley, were powered by repurposed car and truck engines. Earlier skiers had been forced to hike up the slopes that they desired to ski down. But as the twentieth century wore on, people increasingly expected fossil fuels to labor for them in ways that human muscle previously had. Lifts eventually replaced rope tows in Hidden Valley. Some of the early lift technologies that labored for Hidden Valley's skiers were designed and built in Europe, illustrating how the tendrils of the postwar globalized economy reached into windswept public valleys along Colorado's Front Range. Lift technologies were necessary for transforming Colorado's Rockies into ski-based spaces of mass consumption. But skiing at Hidden Valley and around the state also expanded because of a growing and improving transportation infrastructure. Resorts on the western slopes were especially aided by the construction of the Eisenhower Tunnel, a modern structure that perhaps best embodies the Anthropocene's assertion that humans have become an engine of geological change. The burgeoning airline industry also promoted the development of the Hidden Valley Ski Area in the 1950s and 1960s. From diesel-powered lifts, to cars and aircraft, these various engines of the Great Acceleration became increasingly integral to Hidden Valley's operations during the latter decades of the twentieth century.

Hidden Valley's post-WWII history is marked by private- and park service-led efforts to transform what had been an informal, local ski run into an operational resort. Fossil fuels energized this transformation, illustrating the reach of postwar carbon wealth and the growth of a globalized economy that has fomented the Great Acceleration. The first motorized rope tows came to Hidden Valley in the late 1940s. First patented by a Swiss inventor in 1932, rope tows—including RMNP's early versions—were often powered by car and truck engines.<sup>174</sup> “The new rope tow was a fearsome thing for inexperienced riders,” recalled Estes Park resident James Glendenning. “George (Hurt) had a V-8 engine turning a flywheel that whisked people about half way up the

left side of the Big Drift in a few breathtaking seconds.”<sup>175</sup> A propane burner kept the Cadillac V8 warm overnight, maintaining Hidden Valley’s newfound hydrocarbon-dependence around the clock. Hurt also utilized a diesel engine formerly used by an Army truck to power one of the valley’s early tows. Hidden Valley’s rope tows were indicative of a nationwide modernization of the ski industry.

Military surpluses meant that after the war, there was no shortage of hemp, pulleys, or diesel engines which could be combined and fashioned into rope tows. By 1948, America’s slopes were dotted with 850 rope tows, perhaps three times more than in 1940.<sup>176</sup> The “fearsome” rope tows that James Glendenning remembers were nothing to laugh at. Rope tows ran constantly, creating a perpetually moving, high-speed loop of rope that could stretch several thousand feet up a mountainside. Unsuspecting skiers could be violently jerked to the ground by the tows. Worse yet, loose hair or clothing could become caught in the pulley system. Multiple Colorado skiers were maimed and killed by these rudimentary lift technologies.<sup>177</sup> Rope tows represented the convenience of a carbon-rich world, but also the violence that could spawn from such acceleration.

Hidden Valley’s rope tows can be viewed as a microcosm of the turbulent, highly-energized technologies central to the Anthropocene. In fact, the diesel engine stands at the center of the Great Acceleration, as a machine that has labored greatly to produce the abundant, modern systems of production and consumption which undergird the Anthropocene. Noted in the first chapter is the importance that jet turbines have played in fostering a postwar global economy. Vaclav Smil recognizes diesel engines as being just as vital to creating such an accelerated and globalized system of trade. In Smil’s words, studying the evolution of prime movers like diesel engines “informs us about the most fundamental physical determinants of the globalization process, as the dominant prime movers clearly delimit the cost, volume, speed, and reliability of

transfers and trips whose aggregate forms the web of economic and human interactions on the global scale.”<sup>178</sup>

Invented by German engineer Rudolf Christian Karl Diesel in 1893, the diesel engine emerged at the height of marine steam engine-use and at a time when electric and gasoline motors were becoming increasingly reliable and efficient. Yet, Diesel managed to invent a machine that was more efficient than any other internal combustion engine, and one that was also applicable across a number of industries. Diesels quickly replaced steam engines in ships beginning with the onset of World War I. More efficient and less dependent than coal-fired engines on human labor, diesel engines became central to the Great Acceleration as a prime mover that facilitated cost-effective transoceanic trade.<sup>179</sup> Those Kazama skis likely never would have traveled from Japan to Hidden Valley had it not been for Diesel’s engine.

Carbon-consuming machines like the diesel engine provided the energetic means which have made post-WWII trade agreements and development projects practically amenable. And while the diesel engines that powered Hidden Valley’s first rope tows did not, on their own, contribute greatly to the Great Acceleration, they were representative of the speed and mobility that is a hallmark of the globe’s wider postwar economy. In skiing’s instance, diesel engines reengineered peoples’ relationship with the valley, rendering the basin and other mountain landscapes like it accessible to millions of postwar workers and their booming families. It is hard to imagine modern skiing without lift technologies, considering the grueling, time-consuming hikes that fossil fuels have circumvented in the form of ski lifts. Indeed, the speed with which rope tows whisked skiers up mountainsides and with which diesel-powered transport ships carried goods and resources across oceans stand at the core of modern life. They are hydrocarbon-reliant technologies that modern humans, and especially Americans, rely on for innumerable labors. In

the process, these engines have soaked the Earth's atmosphere in carbon and inspired humans to see the natural world as a passive backdrop that can be reordered at our bidding.<sup>180</sup>

Hidden Valley's diesel-powered rope tows represented new material contexts that humans the world-over began to experience after WWII. Acceleration and the technologized transcendence of nature's vicissitudes became the expectation, and it did not take long for locals to begin arguing for the upgrade of the valley's lifts. As early as 1953, two years before Hidden Valley Ski Area officially opened, local proponents of the resort were asking the park service for permission to purchase and install T-bar style lifts, which would involve the erection of towers which would guide the lift's cable system. This was a much safer and more advanced technology than the valley's simple rope tows.

Yet RMNP and the NPS both balked at such an idea. Writing to RMNP regarding the installation of T-bar lifts in 1953, NPS director Conrad Wirth maintained that "The construction of T-bar-type tows must incorporate lowerable structures so that the summer landscape will not be impaired by rows of towers." Furthermore, the building of tows would be considered a private investment and would therefore receive no federal funding.<sup>181</sup> The park service hesitated in fully supporting Hidden Valley's development into a modern ski area because the material alterations to the landscape that modernization would require did not mesh with the park service's role as preserver of primeval nature. However, development of the ski area was not inhibited entirely. The resort would open with the NPS's blessing in 1955, for one. And Conrad Wirth, just a year later, would champion Mission 66, which inaugurated a decade of development of the park system's roads and facilities. He was by no means adverse to human-induced material change in the parks. Yet the tension remained even after the ski area opened. Locals disagreed with the park service's assertions that a modern ski lift would impair viewsheds, especially along Trail Ridge Road. Some

even argued that lifts could be operated in the summer months as a tourist attraction.<sup>182</sup> The NPS won out in this instance, though, and rope tows continued to labor during the ski area's first seasons.



*Example of a T-bar lift erected at Squaw Pass, CO in the 1960s. Courtesy of ColoradoSkiHistory.com*

Opposition to the development of Hidden Valley would arise again in the 1960s and 1970s. This is not to say, though, that private development of Hidden Valley's infrastructure did not continue in the interim. By extension, these developments further integrated RMNP into the postwar global economy and the modern skiing industry. New ski tows built in Austria were installed at Upper and Lower Hidden Valley in 1955. Europe's Alpine countries became the United States' primary supplier of ski lifts in the years following the war, perpetuating Americans' adherence to European ski culture and style.<sup>183</sup> The Austrian tows installed at Hidden Valley were originally powered by diesel engine, though the ski area planned at the time to eventually utilize electricity derived from Estes Park's grid.<sup>184</sup> Over the next several years, the ski area constructed a steam-heated day-use lodge (funded by the NPS), resurfaced the resort's parking area, erected

warming stations and first aid trailers, and built new viewing areas for visitors who wanted to watch Hidden Valley's skiers.<sup>185</sup> These developments required the ski area's investment in additional sources of carbon-based energy. Where steam and diesel engines did not suffice, Hidden Valley relied on gas-powered generators. Oftentimes "warming stations" were simply buses that were left to idle in the resort's parking lot.<sup>186</sup> Skiing at Hidden Valley was rendered amenable to a multitude of visitors in part due to the comfort and labor that a carbon-rich world provided.

And the multitudes were in deed making their way to Hidden Valley and other ski areas across Colorado and the American West. By 1960, 30,000,000 people located in seven neighboring states lived within a day's travel of RMNP.<sup>187</sup> Colorado's population alone more than doubled between 1950 and 1980, from 1.3 million to nearly three million people. Ski resorts like Hidden Valley saw similar growth over this period. Colorado ski areas issued 127,384 lift tickets during the 1960-61 season. By 1973, that number had risen to 400,137. At Hidden Valley, 19,102 lift tickets were issued in 1966-67, while that number had increased to 57,000 by the 1972-73 season.<sup>188</sup> Clearly, more people were living in the areas surrounding RMNP, and those people were becoming increasingly interested in skiing.

Energy-intensive transportation industries had facilitated these developments at the turn of the Great Acceleration, and had worked with Hidden Valley to funnel more and more visitors into the Front Range area. "Continental Air Lines is always interested in helping to promote Colorado ski areas," the carrier wrote to the president of the Estes Park Winter Sports Club in 1952. United Airlines, the Atchison, Topeka, and Santa Fe Railroad, as well as the Chicago, Burlington and Quincy Railroad also responded positively to Estes Park's ski area proponents, offering to advertise Hidden Valley to travelers.<sup>189</sup> The promotion campaign that inspired Estes Park residents to elicit statements of support from transportation industries revolved around the effort to develop

Hidden Valley into a modern consumerist ski resort. In Kathryn Howes Barth and Ann Alexander Leggett's words, Hidden Valley's promoters "called for the installation of a year-round, high-capacity, double chair lift, the development of more trails to serve the lift, a new parking area, sanitation facilities, and new lodges at both the top and bottom of the new lift."<sup>190</sup> Such pronouncements represented the country's growing transportation infrastructure and its desire to direct both resources and customers to RMNP and the areas surrounding the park. The continent-wide, and in the airlines' case, planet-wide travel that these transportation companies aspired to facilitate was undergirded by a host of local programs of modernization and development, such as what initially occurred at Hidden Valley.

Automobile travel also stood at the center of the modern skiing industry's rise in the latter half of the twentieth century. In fact, the development of Colorado's roads would actually work to Hidden Valley's detriment, as new technologies allowed more and more cars to pierce the Rockies and arrive safely on the wetter western slopes, where ski resorts like Aspen and Vail flourished. The connections between road building in the Rockies, the skiing industry, and the Great Acceleration are perhaps best illustrated by the construction of the Eisenhower Tunnel. After the Eisenhower was completed in 1972, "a Chicago skier," according to John Fry, "by plane and Interstate 70, could be on the slopes at Breckenridge or brand-new Keystone or Copper Mountain as quickly as he could drive his VW Beetle or the family's station wagon to Boyne, Michigan."<sup>191</sup> Only the supercharged transportation infrastructure—a network of interstates, tunnels, train tracks, and airspace—that became the United States' circulatory system in the latter decades of the twentieth century could render Denver closer to traveling Chicagoans than parts of neighboring Michigan.

Such a transportation system fomented a glut of carbon emissions, enough to contribute to the transformation of the planet's atmosphere, and also demanded the anthropogenic movement of earth and rock that at times resembled the hewing of past glaciers. The Eisenhower Tunnel is the kind of human construction that will long outlive our species. The millions of tons of rock displaced during its building and the millions of carbon-belching cars that travel through it on a daily basis are indelibly connected to one another. Each were part of a postwar program of global modernization that sought to radically shrink the spaces that separated producers and consumers, a program that has in turn transformed geological formations, ski-worthy mountainsides, and the globe's weather patterns. In the American West and in public lands, specifically, the Great Acceleration is represented by what historian Charles Wilkinson has called the "Big Buildup:" the public-private venture initiated after World War II by politicians and boosters situated on and around the Colorado Plateau, who modernized cities like Phoenix and Salt Lake City by exploiting rich deposits of uranium, oil, natural gas, and water.<sup>192</sup> The Eisenhower Tunnel is an artifact of these prevailing attitudes, and thus an artifact of the Anthropocene. Modern skiing in Hidden Valley and in the American West in general grew out of these developments.

Colorado's ski experts understood the multifaceted changes that undergirded the emergence of modern skiing. Robert Knous, president of Colorado Ski Country USA, a conglomerate of Colorado ski areas which Hidden Valley was a part of, remarked in 1984 that skiing's mid-twentieth century boom was due to "a related 'transportation boom' (increased air travel, the construction of I-70, the opening of Eisenhower Tunnel in 1973) as well as changes in the skiing technology (better and more comfortable equipment, faster teaching methods, the rise of snowmaking machines)—all of which made the sport more accessible."<sup>193</sup> Yet for the most part, Hidden Valley did not reap the benefits of such developments. Promoters had lobbied for the



opening of the ski area for good reasons. Visitation to Hidden Valley increased during the 1970s, even after the NPS called for its eventual closing. True, the ski area would have lost customers to the newly opened western slopes after the Eisenhower's completion. But more importantly, RMNP no longer maintained the political will necessary to maintain the ski area.

Postwar population growth and urbanization in the American West had altered how people related to the natural world surrounding them, especially in regard to public lands. "In western cities such as Denver, Portland, Seattle, Austin, Vancouver, and Omaha, concerns over the environmental impacts of the region's breakneck growth transformed local and regional politics," historian Michael Childers writes. "While this growth brought increased wealth, the pace at which it occurred unsettled many westerners, who watched as rural landscapes quickly transformed into sprawling housing developments and four-lane highways."<sup>194</sup> Concerns over growth in part fueled resentment towards Hidden Valley Ski Area, which many visitors felt marred the park's otherwise pristine mountain landscapes. Such sentiments convinced the Park Service to enact an intermittent shutdown of the resort, with the ultimate goal of returning Hidden Valley to wilderness. By the mid-1990s, signs of the valley's past role as a ski resort had all but disappeared. In most peoples' eyes, the area had returned to its wild roots. Yet this did not mark an end to Hidden Valley's embeddedness in a consumer culture that rested upon the global-scale consumption of fossil fuels and other natural resources. The valley's relationship with such an order was simply re-categorized and consequently obscured.

### *After the Chairlift: Consuming Wilderness in Hidden Valley*

In 1976, Rocky Mountain National Park decided that maintaining a privately-run ski resort inside park boundaries did not mesh with the park service's values or its legal mandates. Notably, the ski area did not fit with mid-century interpretations of the Organic Act, the NPS's founding

legislation which tasks the park service with both preserving nature in the parks and rendering parks accessible to recreation. By the mid-1960s, more and more people were demanding the preservation of wilderness in the national parks, even if that meant decreased recreation. Wider changes in how Americans valued public lands and wilderness dictated that a ski resort was simply too industrial and commercialized of a venue for a park like RMNP to support. Public opposition to the ski area had grown in the years preceding '76. Kay Collins, a member of Denver's Audubon Society, decried Hidden Valley's development in a letter to Superintendent Roger Contor written in 1972. "This one area is out of tune with the concepts and planning given the rest of the park," Collins argued. "This park was set aside because of its unique natural beauty. Backpacking into the park is being limited to protect this natural beauty. But in striking contrast the Hidden Valley area has been allowed to be developed."<sup>195</sup> Others were even more effusive in their disdain for the ski area. "It is appalling that Hidden Valley—no longer hidden—has been open dip and carpeted with macadam and blacktop," George Hughes wrote to Contor in 1973. "The axe has cleared swaths for the erection of mechanical lifts. Hidden Creek runs out of sight in a culvert beneath the entire area—now truly a 'hidden creek.'" Hughes's laments went beyond the aesthetic marring that the ski area created, though. He further criticized the commercialism that Hidden Valley Ski Area represented. "The Hidden Valley development is not only an unnecessary mechanical invasion of the park," he continued in his letter to Contor, "but its purpose is to attract crowds for the sake of profit to business, an obvious violation of park objectives, and one of a type which would lead to the aspect of commercialized amusement parks—forever damaging our magnificent heritage of primeval nature sanctuaries."<sup>196</sup>

These aesthetic and philosophical arguments undergirded much of the wilderness activism that prevailed in American culture at the time; a culture which inspired the decision to close the

ski area permanently. After World War II, Americans—replete with automobiles, paid vacations, and a yearning to escape for a time from the homogenized urban and suburban places that they inhabited—valued the wilderness that places like RMNP could provide, viewing such places as the last remnants of a pure, pre-frontier nature. In Hidden Valley and other places, the “disjuncture between the ideal of a pristine wilderness and the reality of used (and sometimes abused) landscapes created activists,” notes historian Mark Harvey.<sup>197</sup> Whether they came to know “the wild” on the trails or from their cars, these activists campaigned for the creation of a protected wilderness system, a dream that became reality in 1964 with the passage of the Wilderness Act. Though Hidden Valley did not immediately fall under the purview of the Wilderness Act, the values that undergirded the law can be seen in the arguments put forth by visitors like George Hughes. Eventually, the ski lifts and asphalt would be ripped out of Hidden Valley. That would not be the end of Hidden Valley’s story as a place illustrative of global environmental change and the Great Acceleration, however.

Hidden Valley Ski Area was closed for good in 1991, and the process to return the valley to untrammelled wilderness began. At the same time, the park service, along with other public lands agencies, adopted Leave No Trace (LNT) as its wilderness recreation ethic. LNT compels hikers and campers who visit public lands to leave with any and all materials that they entered with. LNT grew out of the same historical moment that created the criticisms of Hidden Valley espoused by Kay Collins and George Hughes. Before the environmental movement manifested LNT ethics in the 1960s and 1970s, hikers and campers on public lands had adhered to “woodcraft” subsistence methods that had been articulated in the early twentieth century by Aldo Leopold. “Woodcraft” methods involved living off of the natural materials that parks and national forests provided for hikers. By the middle decades of the twentieth century, though, hikers and frequent visitors to

parks like RMNP began to realize that such methods were harming the pristine public lands that wilderness advocates wanted to save.

In a process similar to the one that gave birth to modern, consumerist skiing, new technologies like metal-frame backpacks and portable nylon tents made the backcountry increasingly accessible to a wide swath of the general population. Furthermore, infrastructure improvements to the nation's parks facilitated by Mission 66—notably the nearly 3,000 miles of new and rehabilitated roads—meant vehicles could reach formerly secluded areas more easily. The attendant increase in outdoorsmen required the development of new methods of wilderness recreation, lest this growing population of campers overrun the “pristine” places that they valued so much.<sup>198</sup> As the environmental movement was picking up steam, wilderness began to be described in two ways: as a resource for backpackers and hikers and as a pristine space that should be untouched by humans. “Woodcraft” threatened the perpetuation of these spaces, and LNT offered a solution. “The modern wilderness recreation ethic served to negotiate this tension in the wilderness ideal,” writes historian James Morton Turner. “Practicing Leave No Trace allowed an ever-growing number of backpackers to visit wilderness, while leaving its ecological integrity intact.”<sup>199</sup>

The problem of preserving public lands in the face of increased visitor use appeared to have been solved. Conscientious hikers and campers would use outside materials to facilitate their stay in wilderness areas, and so long as they returned to civilization with the accoutrements they had entered public lands with, then wilderness would be preserved. Indeed, LNT's rise reflected a wider advocacy—present both in the public and in the NPS—towards the scientific management of parks' ecological integrity. Wilderness was no longer being considered as simply an esthetic form. It was also beginning to be viewed as a biological state that required active, scientifically-

informed conservation.<sup>200</sup> However, LNT has morphed into something much larger and more complex than the simple set of actions that form its core. Originally an informal set of ethics with a grassroots legacy, it has turned into a formalized public education program replete with corporate sponsors like Patagonia and the North Face—companies whose products depended on the very technologies and global commodity chains that undergird the modern skiing industry and which have spurred the Anthropocene in the form of the Great Acceleration.

Hidden Valley's post-ski area transition to a designated wilderness certainly absolves the valley of its direct perpetuations of the United States' postwar, techno-global economy. No longer were there diesel-powered ski lifts carrying families up mountainside, or rentable Gore-Tex-lined boots for novice outdoorsmen to delight in. But LNT all but insures that wilderness spaces remain, in part, spaces constructed for the consumption of materials like Gore-Tex, which are produced through mountains of capital and far-reaching, modern, energy-intensive commodity chains. Patagonia, The North Face, Subaru, L. L. Bean, and The Walt Disney Company are just a few of the corporations that promote Leave No Trace and donate portions of profit to conservation programs in the name of this ethical paradigm.<sup>201</sup> In his 1989 guide to skiing equipment, Bill Tanler noted that The North Face and Patagonia both offered multiple pieces of clothing replete with a host of DuPont's various synthetics.<sup>202</sup> Companies such as The North Face and Patagonia have become synonymous with wilderness recreation, and they continue to rely on global commodity chains to produce these highly-technologized materials; objects which Pap Ndiaye deftly describes as representations of the "domesticated atom."<sup>203</sup> These companies play a role in perpetuating tensions between global capitalism and degradation of the natural environment, but by promoting Leave No Trace, they implicitly call on consumers to accept the notion that consumption is

compatible with conservation. Better yet, by consuming these companies' products, customers are advocating and actively bolstering wilderness protection.

Patagonia provides a transparent view of the global supply chains that define companies affiliated with both LNT and modern skiing and outdoor recreation. Scores of textile mills and factories, as well as two farms, that each provide Patagonia with raw materials and finished products (most of which are sold in the U. S.) are located in the United States, Argentina, Italy, Israel, India, and Japan, among other nations.<sup>204</sup> Patagonia relies on the cheap labor that many of these countries provide, and many of the factories that the company is affiliated with are located in countries with relatively lax environmental regulations. Thus, Leave No Trace's success, tied up in the profits of its corporate sponsors, is dependent upon the exploitation of land, resources, and human bodies located in places far from America's public lands. Patagonia should be commended for making publically accessible the various commodity chains that are the lifeblood of their business. But such revelations are the result of political pressures borne out of Americans' queasiness over post-WWII globalization and its uneven distribution of both commerce and waste. That unevenness continues today, and can be seen in programs like LNT, which dictate how national park land is used, as well as in the technologies—from cars to jackets—that visitors to parks like RMNP rely on.

Geographer Gregory Simon and historian Peter Alagona argue that through Leave No Trace, “The shopping mall becomes an arena not just of commerce, but one of moral discourse in which consumption provides a means of producing ethical subjects: people who will purchase certain products in order to reconcile their relationships with nature and live a more principled life.”<sup>205</sup> According to historian Jennifer Price, this fetishization of outdoor recreation materials and of nature itself is central to modern, middle-class American culture. “In modern America

harvesting nature for a psychic yield has become a defining middle-class pastime. We graft meanings onto nature to make sense out of modern middle-class life, and then define ourselves by what we think nature means.”<sup>206</sup> For modern Americans, post-1991 Hidden Valley is a wilderness, a place for contemplative recreation and solitude. And in an environment like Hidden Valley, these seemingly altruistic forms of recreation require the climate-controlling technologies mastered by Patagonia, the North Face, and its partners. Few hikers or campers have considered the contradictions that lie at the center of Leave No Trace regarding its relationship with corporate sponsors and the role those sponsors have played in perpetuating a modern economy that has fomented global climate change.

Leave No Trace’s implementation into RMNP policy is relatively silent in the park’s archives. A handful of backcountry use guides from the 1970s and early 1990s speak to the rise of the paradigm among hikers and park managers. One 1977 guide declares to campers, “NO FIRES.” Rather, hikers should come prepared with gas stoves.<sup>207</sup> This strategy surely protected the park’s trees from fires, its wildlife from plastic containers and aluminum cans, but it also represented an instance in which campers had to insert themselves in a modern, supercharged economic system where people are increasingly reliant upon specialized production processes that have reshaped landscapes in latent ways. Synthetics like nylon and Teflon—important materials in outdoor recreation and skiing—have poisoned West Virginians, Indians, and their cattle. The roads, airways, and shipping lanes that move such materials have saturated the atmosphere in carbon and noise, creating both global and local environmental problems, damaging entire ecosystems as well as eardrums, and peoples’ desire for solitude. Today, signs bearing the Leave No Trace logo and advising hikers on how they can strive to “leave no trace” have been erected at most trailheads in the park. Leave No Trace and its connections to the modern, technocratic systems of production

which have helped to create the Anthropocene are evident. The same synthetic materials which lie at the core of the technologized-style of hiking and camping which Leave No Trace supports were also present in Hidden Valley during its days as a ski area. And while hikers, campers, and the companies that clothe and equip them are quite conscious of protecting natural environments and preserving wilderness, the materials they rely on should still be understood as consumer products that have proliferated due to the Great Acceleration.

Criticizing the paradigm should not be tantamount to scrapping it altogether, though. As Simon and Alagona argue, we should expand Leave No Trace ethics “to include the global economic systems that make contemporary American wilderness recreation possible.”<sup>208</sup> Leave No Trace, as it stands, commands a highly localized view of the natural world. Yet the Anthropocene argues that our effects upon natural environments are so spatially and temporally vast, that we need to start considering human history and natural history as one.<sup>209</sup> For both historians and park managers who are proponents of Leave No Trace, a wider view of human relationships with the natural world would serve us well in both understanding the past and advocating for sustainable actions in the present. At Hidden Valley, few remnants of modern skiing still exist. Concrete foundations, car engines, and cables have all been removed. The Kazama skis and their antiquarian wooden counterparts are tangible mementos of a past that has largely disappeared. Yet the effects upon the wider natural world which modern skiing helped to create echo whenever I hike Hidden Valley in my North Face jacket, or fill up my plastic Nalgene bottle at the valley’s trailhead. Considering the engines of change which the wilderness recreation industry helps to perpetuate can help us to understand the wider systems of production and consumption within which we are embedded, and which have helped maintain the Great Acceleration.



## *Conclusion*

RMNP's role in the development of modern skiing implicated the park in an era of globalized fossil fuel consumption that stands as a hallmark of the Great Acceleration. Hidden Valley Ski Area's demise was rooted in the same cultural developments that stood at the core of Leave No Trace's rise. RMNP's attitudes concerning the ski area often stood in line with the changes in American culture regarding wilderness and public lands that proliferated in the middle- and latter-decades of the twentieth century. Committed to development and economic stimulus in the years immediately following World War II, recreational opportunities like Hidden Valley and improvement programs such as Mission 66 meshed with the American population's desire to visit their national parks and to do so comfortably and abundantly. And as Americans became increasingly disenchanted with industrial-urbanization and overcrowding in the parks, public lands like RMNP became repositories of growing wilderness values, best represented through the passing of the Wilderness Act in 1964, a law which now governs the management of Hidden Valley. There were opponents to both development and legislated wilderness in the park system at the time. Wildlife biologists employed by the park, and conservative directors like Newton Drury, who ran the NPS during World War II, were wary of tourist-centric development and its place in nature preserves like the parks.<sup>210</sup> In contrast, Conrad Wirth, who championed Mission 66, opposed the passage of the Wilderness Act, arguing that the park service already preserved and perpetuated wilderness, and that more legislation would only hamper development and visitor experiences.<sup>211</sup> But ultimately, changes within the park system, through legislative mandate, reflected postwar Americans' techno-optimism and fervor for prosperity, as well as their attendant fears over out-of-control growth.

As various processes of human-induced environmental change proliferated around the globe in the latter stages of the twentieth century, often at the behest of American industries and the American government, Americans with more domestic concerns increasingly couched RMNP and other public lands as places that should be freed from human exploitation and allowed to return to their primeval splendor. The national movement to protect wilderness that arose in the 1960s and 1970s bears similar characteristics to the United States' first wilderness movement, championed by John Muir and others, and which culminated in the creation of the NPS. Muir and his contemporaries argued that wilderness was an escape from urbanization, from a world that was becoming louder, faster, and increasingly interconnected.<sup>212</sup> In this sense, wilderness preservation in the United States has always been in conversation with urbanization, with various systemic and material engines of the Anthropocene. Wilderness has acted as a cultural value that can facilitate moments of escape for wary workers and their families. It is the quiet and contemplative foil to a country founded on tireless industry and energetic labor.

The Anthropocene begs wider questions concerning the relationship between wilderness and modern urbanism and industry. RMNP was shaped by the urban Front Range, by the economic concerns and transportation infrastructures of nearby cities like Denver, Boulder, and Fort Collins. Indeed, the Wilderness Act, which came to shape the park service in important ways, was originally inspired by environmentalists who feared Americans' obsession with automobiles.<sup>213</sup> Conversely, David Louter and Mark Harvey both note that roads and automobiles have inspired wilderness activism by facilitating visitation to parks. But RMNP and other parks also been shaped by moments of industrialization and technological advancement in other places. Ski lifts designed and built in Austria facilitated Hidden Valley's growth as a ski resort. Skis made in Japan entered a growing ski equipment market which rendered the sport increasingly accessible to a wide swath

of the American population. And the oil that fueled RMNP's original lifts, went into the plastic pieces of those Kazama skis, and energized the machines that moved such materials across oceans, may have been extracted from Saudi Arabia, Venezuela, or Texas, from the Gulf of Mexico, Nigeria, or the Soviet Union. The supercharged modern economy which shaped the material realities of postwar Americans connected distant, disparate places. As we can see in Hidden Valley, this globalized economy and its transformative power made its way into nature preserves like RMNP. Hidden Valley's history remains as a relic to the material changes wrought in America's post-WWII modernity. And its transformation back to wilderness cannot be entirely separated from the modern consumptive practices that shaped Hidden Valley into a modern ski area, and which wilderness advocates began to decry as the twentieth century closed.

Wilderness advocacy in RMNP does not just act as an antithesis to the urban-industrialized, technologically-advanced systems of knowledge and development which animated life in postwar America. Returning places like Hidden Valley to "wilderness" requires machines, and energy to fuel those machines. It also requires human labor, a venture which can facilitate sympathetic relationships between workers and nonhuman nature.<sup>214</sup> "Rewilding," which refers to the process of returning anthropocentric landscapes to wilderness, requires modern technologies and modern forms of natural resource management, both mainstays of the Great Acceleration. Rewilding became an important management issue in RMNP in the latter-half of the twentieth century, especially after the passage of the Wilderness Act. Today, the park continues to actively return previously peopled landscapes to some vestige of past wildness. The ways in which the same systems of production and consumption which have forged the Anthropocene have also shaped efforts to rewild portions of RMNP will be the subject of the next chapter.

### **Chapter III: Militant Management: Elk Management in RMNP after World War II**

In 1973, RMNP initiated perhaps its strangest elk-tracking program to date. That year, the NPS—in tandem with the U.S. Forest Service and Colorado Division of Wildlife (CDW)—hired civil aviators to take to the skies over the park. Pilots were asked to swoop down and fire 20-gallon loads of marking dye at unsuspecting elk that were ranging along high-altitude grassland. “Multicolored elk—red, green, blue, black and orange—will exist beginning about mid-August,” one local paper quipped. “Anyone who reports seeing one should not, repeat, should not be hustled off to the nearest pokey for a sobriety test.”<sup>215</sup> So long as visitors and members of the community reported the location of painted elk to the park, managers could track herd movements throughout the year. Harvey Donoho, a biologist with the CDW, argued that dive-bombing elk with aircraft-mounted paint guns was more cost effective than affixing neckbands to individuals, since entire herds could be marked at once. The park’s air campaign would also preclude the need for trapping elk, a laborious and time-consuming task. Speed, and the mechanical conquest of gravity, saved dollars, if not the psyches and solitude of local elk.

RMNP’s dramatic paint-strafting of elk serves to highlight elk management’s importance to RMNP in the postwar era, as well as the technologies, energy systems, and techniques that were central to elk management during the Great Acceleration. Machines like aircraft were employed to help manage overgrown elk herds, which had flourished in the early-twentieth century in landscapes sanitized of predators. Park rangers and biologists first began to notice overgrazing in the park in the 1930s. In fact, overpopulation of herbivores like elk and deer was a problem throughout the West’s national parks. Before the latter half of the twentieth century, biologists and ecologists had relatively little say in NPS policy. Park managers and NPS officials considered

tourist-drawing animals like elk “more useful” than predators like bears, wolves, coyotes, and mountain lions.<sup>216</sup> These predator species were often eradicated in areas surrounding parks, thus creating conditions for elk population explosions.<sup>217</sup> Such conditions prevailed in and around RMNP during the interwar years.

By the end of the Second World War, RMNP was culling elk and deer in an attempt to check its ungulate populations.<sup>218</sup> Culling was, from its inception in the mid-1940s, a controversial process. One problem was that visitors and people living around the park had been conditioned to consider overgrazed lands and inflated elk populations as normal. Neal G. Guse, Jr., RMNP’s first permanent wildlife biologist, noted in 1962 that “much of the local opposition to ‘management’ comes from those who remember the early 1940s when it was not uncommon to observe deer and elk herds numbering in the hundreds along the roads at any time of the day or night. This, of course, was later recognized as a wholly unnatural situation requiring control, but at the time, it was in keeping with the Service objective of providing for the enjoyment which in this case was native wildlife.”<sup>219</sup> Booming elk herds had become naturalized in many peoples’ minds. For many Americans living in the first decades of the twentieth century, a park’s health was judged based on the sheer size of the populations of its most iconic species. For RMNP and other parks in the West, that species was elk. But active management became necessary in the NPS’s eyes once biologists like Guse began to study the deleterious effects that overgrazing had on RMNP’s grasses, forbs, and trees.

Culling was not the only management strategy adopted at the outset of the Great Acceleration. Trapping, tagging, and tracking elk also became important, and each of these processes was rooted in hydrocarbon-powered technologies. Jeeps became essential tools in managing RMNP’s elk. Developed in the early-1940s by the United States military as a light

reconnaissance vehicle, the jeep was built as a gasoline-powered replacement to the mule and horse.<sup>220</sup> After the Second World War, the off-road vehicle was first marketed as a mechanized farmhand, then as a vehicle perfect for a growing number of Americans who found meaning in wilderness and the ability to carry themselves beyond the United States' high-modern, rigid web of roads and highways.<sup>221</sup> For RMNP rangers and biologists working in the 1950s and 1960s, jeeps became essential tools, allowing park staff to traverse difficult off-road terrain. Managers preferred to cull elk from roadsides, but at times it became necessary to leave the asphalt. Jeeps carried staff and their Winchester rifles beyond RMNP's roads, and hauled elk carcasses out of the park much faster than horses or humans. In the process, park staff spread the use of industrial machines throughout the park and into "wild" areas of RMNP's front-country.

Aircraft also played an important role in elk management. Harvey Donoho's paint-canister armed airplanes were not the only airborne elk managers. Beginning in the 1960s, helicopters became essential management tools in RMNP's effort to understand and control its elk population. Herd counts were made from the air, and aerial photography became important to tracking vegetation changes wrought by overgrazing.<sup>222</sup> Managers even used helicopters to drive elk off of overgrazed land, especially after 1962 when lethal management programs fell out of favor. Helicopters, originally a military technology, were increasingly applied to civil and commercial tasks following the Second World War. In the park and elsewhere, they represented a novel form of motive power that facilitated new ways of applying fossil-fuel energy to human labor.

Eventually, elk researchers working with RMNP's elk herds also came to rely on radio transmitting collars. Wildlife biologists mastered radio telemetry technologies in the early-1960s. In the years following the onset of the Cold War, radio-based wildlife research was often funded by and developed in collaboration with branches of the U.S. military, which considered compact

radio tags and transmitters promising pieces of a burgeoning Cold War-era surveillance apparatus.<sup>223</sup> In applying technologies like helicopters, jeeps, and radio tags to the management of elk, RMNP reflected a wider trend of the Great Acceleration whereby military implements were applied to commercial and civilian life in growing numbers. Often powered by fossil fuels, dependent upon modern, urban-industrial systems of transportation infrastructure, and molded by a military-industrial-university complex that outlasted World War II, such technologies reshaped landscapes (sometimes through conservation) and transformed human relationships with the natural world, both in and beyond RMNP.

It is elk management's interaction with infrastructure developments beyond the park that renders the Great Acceleration a useful tool for illuminating RMNP's post-WWII elk management history. RMNP's elk problem was dynamic, predicated not just on conditions within RMNP, but also upon processes occurring at various spatial scales that operated beyond the park. Urbanization along the Front Range, especially in and around Estes Park, increasingly cut off elks' easterly migration corridors. Suburbanization—including the construction of mountain communities which one historian has termed “wilderburbs”—took off in the early 1950s.<sup>224</sup> Facilitated by federal highways which streamed cars, people, and industrial materials deeper and deeper into the mountains, Americans colonized large swaths of mountainous wilderness in the years following World War II. The construction in the 1930s of U.S. Highway 34, which gouged its way through the Big Thompson Canyon, connected Estes Park to growing cities like Loveland and Fort Collins. Such development projects—tied to a national program of highway building, itself undergirded by a global proliferation of hydrocarbon-dependent vehicles—put serious strain on RMNP and its elk herds. A growing, increasingly sophisticated global transportation system, highlighted by

automobiles as well as the commercial airline industry, transformed the Mountain West into mass consumerist tourist hinterlands.

But the urbanizing, tourist-centric Front Range also seemed to offer solutions to swollen elk herds. Throughout the latter decades of the twentieth century, sportsmen's groups argued that hunters were the answer to the park's elk woes. Sport hunting, a pastime that large numbers of middle class Americans took up in the aftermath of global war, grew into an important component of Colorado's tourist industry during the Great Acceleration. The proliferation of fossil fueled-mobility brought more and more hunters into the areas surrounding RMNP, and these hunters—as well as state bureaucracies like the CDW—placed pressure on the NPS to consider allowing public hunting in national parks. In hunters' eyes, opening the park to sportsmen's rifles was a win-win situation. RMNP's elk problem would be solved, Colorado would earn increased revenue on hunting permits, and the hunters themselves would be, in effect, given access to land and game that they felt was rightfully theirs to exploit. The NPS never allowed hunting within park borders. But during this period, RMNP agreed to ship elk to public lands across the state, especially those that allowed hunting, as a means of reducing elk herds and invigorating Colorado's tourist economy. As more people entered Colorado and accessed its most secluded lands via modern transportation networks, new practical and ethical questions regarding the management of elk arose. This predicament, as well as growing problems regarding increased visitation to the parks, were, at their core, problems fostered by a population that was accelerating its consumption of mobilizing energies.

As more energy flowed into Colorado, Estes Park, and RMNP via this web of mobility, more energy and forage was subtracted from elk habitat and from the park's popular but precarious elk herds. The connections between the park's elk and the rise of a widespread hunting industry



reflected RMNP's ability to harness fossil-fuel energy, helping to pull the people and machines that consumed that energy into Colorado. Meanwhile, the tangible pieces of the Colorado Front Range's growing urban-industrial infrastructure robbed elk of traditional rangeland and migration corridors. RMNP staff reported on how building projects like the Colorado-Big Thompson water reclamation project inhibited elk movement. Roads and housing developments transformed forage and woodland shelter into tarmac, concrete, and brick. The organizational mechanics behind these largescale developments even made their way into the abstract realms of ecological theorization. Ecologists increasingly imagined ecosystems as organic mechanisms, harnessing, consuming, and repackaging energy as if they were grand assembly lines. It would be a stretch to describe all of these scientists as techno-optimists, but the imaginings of a techno-optimistic, managerial world certainly affected their own thinking when it came to questions of ecosystem structure. Elk fit into these machine-like structures of ecosystem function somehow, but the struggles ecologists and managers faced in reconciling RMNP's elk with an increasingly human-occupied world continued.<sup>225</sup>

RMNP's postwar elk problems, and its connection to global energy systems, took on one final form: management technologies like jeeps and radio collars gradually colonized public lands across the planet, highlighting the ways in which the Great Acceleration was a period defined by newfound scientific practices that sought to understand nature at a global scale. After World War II, wildlife biologists in non-Western countries relied upon the United States' sprawling university-military-industrial complex to provide equipment, expertise, funding, and academic legitimization. As rich energy networks gradually Americanized science on a global level, scientists invented ways of thinking about and understanding natural systems on a global scale. Technologies forged in the Great Acceleration connected scientists in new ways, and also fostered new data-gathering

capabilities. From climate systems to wildlife ecology, researchers, cohered through a rich energy regime, sought to empirically understand the natural world at a planetary scale. Hydrocarbon energy bridged the gap between thinking globally and implementing scientific studies globally. Ironically, this process created the conditions whereby researchers came to understand the dramatic, planetary-scale environmental changes humans had wrought.

These different energy and knowledge systems and their post-WWII spread animated the Great Acceleration. Connected to networks of conservationists, biologists, and ecologists, the machines and infrastructures that powered overgrazing in the park also powered the production of scientific knowledge and its progressively sophisticated application to RMNP's elk issues. For instance, the park's current elk and vegetation management plan, created in 2007 and first implemented in 2008, is a highly nuanced document that attempts to manage the park's elk based on knowledge and expertise that simply did not exist at the end of the Second World War. For the first time since 1968, the park is using lethal methods as part of its management policies. Many of the technological tools utilized by managers remain the same now as they were then, albeit in updated forms. Off-road vehicles, helicopters, and radio collars—each forged in the complex of energetic industries that have thrived during the Great Acceleration—remain central to elk management in the park over half a century later. But such technologies, which shrink our experience of time and space, can also help us begin to think about landscapes in a holistic way that is perhaps better not only for elk, but also for people living in the Anthropocene. Public lands, residential developments, and commercial zones do not exist in an elk's mind, but such separations certainly dictate human behavior. If humans want to continue to preserve elk habitat, then it would be fruitful to consider changing the ethos people use to think about landscapes, and to question the habit of partitioning landscapes based on their use. Thinking differently about RMNP, its adjacent

lands, and elk will be the subject of this chapter's conclusion. First, though, we should dive into the world of post-WWII elk management in the park, and its connection to novel uses of fossil-fueled technologies.

### ***Hydrocarbon Harvests: Jeeps, Highways, and Culling RMNP's Elk***

Today, Americans often celebrate the jeep as a recreational vehicle, a machine that can carry them beyond the highly rationalized, concrete and asphalt barriers to which most automobiles must conform.<sup>226</sup> Contemporary advertisements for these off-road vehicles reveal as much. "Take on anything nature throws your way," one ad declares, depicting a jeep driving head-on into an oncoming avalanche.<sup>227</sup> Another set of ads show jeeps traversing a number of formidable landscapes, from boulder fields to post-apocalyptic urban ruins, each adorned with the caption, "The toughest vehicle in the world."<sup>228</sup> An ad for a jeep from the 1990s perhaps best reflects the 4x4 vehicle's propensity for escape. The new Jeep Wrangler is "ready for anything," this ad claims, "Even the environment Jeep drivers dread most. Civilization."<sup>229</sup> Such anti-urban sentiments appear throughout ads for these off-road vehicles, even when these cars are often driven by affluent suburbanites, most of whom likely never take their jeeps off-road.<sup>230</sup> The dramatic scenes of wilderness recreation illustrated in jeep ads obscure the vehicle's often mundane, tied-to-highway realities. Such images also fail to convey the jeep's history as weapon and laborer.

Developed in 1940 by Bantam at the behest of the United States Army, which needed an off-road, light reconnaissance vehicle, the first jeep prototype, "thrashed within an inch of its young life," was rigorously tested stateside at the hands of the army.<sup>231</sup> Deemed fit for battle, the army ordered the construction of thousands throughout the Second World War. As a quick, easy-to-operate, off-road transport, the jeep was the first gasoline-powered vehicle of its kind to be mass produced. The jeep could maneuver through terrain that had formally been the stomping grounds

of beasts of burden, including mules and horses.<sup>232</sup> After the war, manufacturers marketed jeeps as fossil-fueled farmhands. Willys-Overland, which had acquired the rights to the Jeep trademark near the end of the war, saw its off-road vehicles “not as another motor vehicle, but as a new means of applying motive power to the world’s work.” In its opinion, jeeps represented “a new tool with which man can do his work faster, easier, and more economically.”<sup>233</sup> The Atomic Energy Commission and individual miners also came to rely on jeeps as they searched for uranium throughout the rugged, undeveloped Colorado Plateau in the years following the war.<sup>234</sup> Jeeps were marketed and sold internationally. Appearing in both American and Spanish newspaper ads as mechanized farmhands, jeeps represented the global-scale application of American military technologies to industrial ventures.<sup>235</sup> From the United States, to Spain, to Mexico, China, and Sweden, jeeps were exported around the world throughout the post-WWII era.<sup>236</sup> Hydrocarbons and military technologies fostered, on a global scale, novel forms of mechanized, off-road labor and energy resource harvesters.



*Image from a Willys-Overland 'Jeep' ad, 1940s. Jeeps were advertised after the war as mechanized farmhands. Courtesy of University of Toledo Library*

Jeeps even found their way into RMNP, where they acted as important machines in the park's elk management tasks. The first mention of RMNP's jeeps appeared in 1956, in reports produced by the park in review of RMNP's eleventh year of direct culling. "The National Park Service Jeep pickup 4x4 with winch is a must for reduction work," the elk management report declared.<sup>237</sup> In subsequent years, park staff requested jeeps with stronger winches, presumably for hauling carcasses. Regardless of their pulling power, park staff, especially those responsible for culling elk, celebrated their jeeps for their ability to drive off-road and traverse terrain that normally required horses or hiking boots.<sup>238</sup> The success of the jeep even inspired park rangers to request an "over the snow vehicle" which could be employed during winter culls.<sup>239</sup> When jeeps were not readily available for elk reconnaissance trips, rangers were forced to take to their feet. The park's wildlife management reports note ten-mile snowshoe hikes and long trips by horseback.

Park staff utilized these time-consuming, inefficient ventures in attempts to track elk herds and view overgrazed wood- and grassland.<sup>240</sup> Ideally, these jobs could be completed behind the wheel.

Jeeps provided an important source of accelerated, carbon-fueled labor to park staff at a moment when elk culling became urgently necessary and increasingly controversial. Heavy culling was undertaken by the park between 1944 and 1950, but overgrazing continued to represent a vexing issue for the park's managers. Expansive culling operations had also fostered enmity from local residents and park-goers, who viewed the killing of elk as anathema to the park's mission as a nature reserve. During a two-month period in 1944, NPS staff culled over four hundred elk from the park.<sup>241</sup> Such pronounced efforts of lethal control were difficult to hide. Beginning in this period, the park attempted to coordinate with hunters situated just beyond park boundaries, in hopes that elk populations could be controlled before they ever entered RMNP.<sup>242</sup> These operations were often conspicuous, but jeeps enabled off-road culling efforts which were at least in part obscured from the vast majority of park visitors. As hydrocarbon-powered machines expanded beyond roadways, they could be increasingly applied to new forms of covert labor. Jeeps represented the means by which fossil fuels colonized new geographic areas within—and beyond—the park.

Carbon-dependent transportation shaped elk culling in RMNP in other ways as well. Notably, RMNP's roads became staging points for elk culling operations. When RMNP staff organized elk culls around the geography of the park's postwar roadways, they were, in the process, making certain practical statements about the management of RMNP's elk, and about park wildlife in general. Whenever possible, park managers harvested elk from roadsides, often in early morning hours, when visitors were sparse. The first elk culling protocols, produced by park naturalist David Condon in 1943, stipulated that “[a]ll animals should be killed as near to points

accessible to motor transportation as possible to reduce the cost of operation and time involved in handling each animal. The distribution of roads will make the major portion of the range areas accessible for reduction purposes.”<sup>243</sup> These regulations were published before jeeps were utilized in the park. But even after the inception of jeeps, park managers preferred to hunt from roadways, where their winch-equipped pickup truck more efficiently removed elk carcasses.<sup>244</sup>

These roadway-determined rules of the harvest were consistent with the modern American culture of wildlife viewing. Most Americans desired to experience nature from the comfort of their vehicles, a form of wildlife viewing which ultimately transformed elk behavior and facilitated roadside shooting. RMNP’s elk, and indeed ungulates throughout other western parks, often behaved as if they were immune to the noises and crowds which roads funneled into the park. Especially in the early-twentieth century, park service personnel celebrated herds of elk that appeared conditioned to the gasoline-powered machines that were becoming ubiquitous in parks. Roger Toll, who headed RMNP in the 1920s, celebrated the “tame” elk that, to visitors’ delights, gathered along roadsides en masse.<sup>245</sup> Yellowstone’s staff were fond of its own elk herds, which in many ways were managed in the early 1900s as a domesticated variant of wild elk, and were fully conditioned to the presence of automobiles.<sup>246</sup> Writing about visitor roadside-feeding of Yellowstone’s bears, historian Alice Wondrak Biel also illuminates the nature of elk behavior in parks like Yellowstone and RMNP: these animals’ behavior were the product of a “particular combination of people, nature, and modernity.”<sup>247</sup> In their behavior, elk embodied the centrality of hydrocarbon energy systems to both the management of and visitation to national parks. In its early decades, the NPS celebrated the behavioral transformations that machines fostered in park wildlife.

Reflected in jeeps, trucks, and the behaviors of managers, park visitors, and the wildlife that resided in RMNP, was the ubiquity of hydrocarbons and the machines and transportation systems they powered. Framed beyond the park's boundaries, RMNP's elk issues also sprang from the Great Acceleration's democratization of fossil fuel-use and the infrastructure developments which facilitated postwar shifts in the scale of inorganic energy use. The eradication of predators in and around RMNP played a major role in the explosion of elk in the park beginning in the 1920s. But other factors also played a role in this up-swelling. Throughout the latter decades of the twentieth century, Rocky's managers pointed out the fact that urbanization adjacent to RMNP and along the Front Range increasingly constrained traditional elk migration routes. Summering in the high-altitude areas common within RMNP's borders, elk left the high country in the winter, seeking lower altitudes, warmer temperatures, and more abundant forage in eastern Colorado's foothills and plains. But anthropogenic factors—notably the construction of roads, residences, reservoirs, and power plants during the decades surrounding the Second World War—limited elk movement to the east of the park.

David Condon first identified the connection between urbanization and the constraining of elk in 1943. Estes Park, which sits directly east of RMNP, has always been a relatively small town. But the early and middle decades of the 1900s represented a time of accelerated growth in the city. Between 1930 and 1960, when elk overpopulation became a major issue in the park, Estes' population grew from just over 400 people to well over 1,600.<sup>248</sup> Denver, Fort Collins, Longmont, and Loveland, all Front Range cities which helped funnel people into RMNP, each experienced substantial growth in this period as well. Urbanization in these areas constrained space for movement, and suburban developments on the margins of metropolitan areas converted former rangeland into manicured lawns, asphalt, and brick structures. Beginning in the 1950s, Colorado



became a national center of development, not only supporting growth in traditional urban areas, but also pursuing the erection of mountain communities located in places that had formerly served as ranchland and wild rangeland.<sup>249</sup> As more and more people desired to both visit and live in Colorado's high country, less space and fewer resources were reserved for Rocky's elk.

Urban development around the park often depended upon fossil fueled-technologies. Newly built infrastructure also facilitated the accelerated, far-flung application of hydrocarbon energies both in the Rockies and to their ever-growing eastern hinterlands. The development of energy infrastructure played a specific role in constraining elk migration. Writing in 1950, park rangers A. Lynn Coffin and J. Barton Herschler noted that construction of the Marys Lake Power Plant in the 1940s had constrained normal elk migration in and out of RMNP.<sup>250</sup> Located just south of Estes Park and immediately east of the park, the Marys Lake Power Plant was built as part of the Colorado-Big Thompson Project (C-BT), a hydro-resources operation that siphoned water from the Colorado River eastward, across the Continental Divide and into farmland and urban areas located along the Front Range. Coffin and Herschler generally identified construction related to the C-BT as "a definite migration barrier."<sup>251</sup> The construction of Marys Lake Power Plant denied elk their traditional movement patterns, thus further straining the park's ability to sustain the elk herd.

The Marys Lake Power Plant is indicative of the hybrid, human-natural systems of energy infrastructure which helped accelerate growth along the Front Range. The Colorado-Big Thompson project provided an artificial watershed for burgeoning urban and agricultural areas, in the process helping to sustain growth and the continued application of gasoline, coal, and concrete (among other mineral fuels and structures) all along the eastern edge of the Rockies. During World War II, Colorado politicians secured federal protection for the C-BT's series of tunnels, power

plants, and reservoirs by highlighting the project's electricity-producing potential. Designated by Franklin Roosevelt as vital to national defense, the federal government considered the C-BT an infrastructure-improving project worthy of receiving "anti-sabotage policing." Expanding their vision beyond matters of defense, the project's proponents also celebrated the commercial possibilities born out of energy generated by the siphoning program. Water, redirected eastward across the Continental Divide, would rush down the Front Range, powering homes, businesses, machines, and ultimately the national state. Tapping into a culture of state-building centered on reclamation and militarization that was first fostered during the New Deal, managers and politicians reconceived the C-BT, originally developed with farmers in mind, as a trans-mountain system of urbanizing energy that would serve city, suburb, and farm alike.<sup>252</sup> The positive feedback loops created by such a project helped cultivate a multiplicity of road networks, communities, and tourist infrastructure, all of which encouraged wildlife viewing while simultaneously threatening the health of the park's elk herd.

Through a combination of off-road vehicles and highways, power plants and commercial developments, RMNP's elk became increasingly implicated in a fossil fuel-rich culture of tourism and technocratic management. From jeeps to Winchester rifles, various military technologies facilitated the park's elk harvests. On a broader scale, defense-related development along the Front Range before and during World War II constrained elk movement, and also accelerated human population growth in areas adjacent to RMNP. This new population and the surging number of tourists who entered the park after the war were often virulently opposed to elk culling. As the environmental movement began to coalesce in the 1960s, citizens began to fear a federally subsidized technocratic elite that was simultaneously poisoning humans and killing animals like elk. Wilderness advocacy in part sprang from these 1960s-attitudes. Such attitudes also led to the

post-cull explosion of elk in the park. In this sense, wilderness was conceptually tied to the Cold War, and it was a counter to the technologized, militarized economy that helped to produce the Great Acceleration.<sup>253</sup> While Coloradoans and out-of-state tourists alike lamented culling as unnatural and gruesome, many simply found the park service's efforts to manage elk inefficient and undemocratic. Citizens and state agencies asked, why not open the park to hunters? Despite the pressure to do so, the NPS never allowed hunting within park units. However, RMNP actively worked with hunters as part of their elk management goals. In doing so, the park increasingly integrated the Front Range's elk herds into carbon-dependent tourist hinterlands. Increased calls to end direct culling in the park also encouraged RMNP to champion nonlethal modes of scientific study, a trend which pulled new fossil fueled-technologies into the park.

### ***Rotors and Rifles: Airborne Elk Management and Colorado's Hunters***

In 1962, amidst tensions that brewed over the lethal culling of elk within RMNP's boundaries, RMNP, the Roosevelt National Forest, and the CDW formed the Rocky Mountain Council for Cooperative Wildlife Management. The cooperative management agreement signaled several changes regarding the management of the park's elk. While direct culling remained an option for park staff, new guidelines encouraged the trapping of live elk. Trapped animals were then transferred by state employees to areas around Colorado, from the Spanish Peaks to the south, to the Greeley Zoo up north.<sup>254</sup> Simultaneously, the park undertook an extensive tagging program, meant to educate park staff and officials working with the CDW about elk movement in and around the park. Data regarding herd populations and movement was gathered by the participating agencies with eyes to Colorado's growing market for sport hunting. The NPS, U.S. Forest Service, and CDW hoped to utilize data gathered through tagging operations and apply it in the organization of hunting seasons. If only elk movement and distribution could be better understood, private

hunters could be organized to complete the dirty work of culling, and they could do so outside of the park, precluding the political controversies that surrounded elk management. These efforts largely failed. But while such attempts to manage Rocky's elk failed overall, they did succeed at inserting machines and technologies that were fostered in the Great Acceleration into the life of the park's most famous ungulates.

Americans' postwar environmental consciousness often included a stated distrust for modern growth and development. Environmentalism in part grew out of Americans' anxieties about corporate capitalism and a sprawling, technocratic federal government that wielded unprecedented destructive power in the form of nuclear weapons.<sup>255</sup> Yet modern science and conservation, institutions that citizens increasingly entrusted to protect wildlife, depended upon novel technologies and machines.<sup>256</sup> Modern technologies could serve to destroy or protect, and postwar Americans often struggled to articulate which contrivances belonged in parks, and to what ends they should be employed. Increasingly during the 1950s and 1960s, RMNP's visitors and stakeholders decried rifles, bullets, and the dead elk they portended. Perhaps new technologies could be harnessed to manage elk in non-lethal ways. One such implement was the helicopter.

In the 1960s, Rocky came to rely on helicopters for tracking, tagging, and even herding elk as they moved in and around the park. The first helicopter was designed by Igor Sikorsky, a Russian who fled to the United States in the aftermath of the Russian Revolution. Sikorsky's XR-4, produced with the aid of military funding, first flew in 1942, and the army utilized the Russian expatriate's aircraft late in the war during rescue missions in the Pacific theater.<sup>257</sup> Aircraft engineers and executives entertained high hopes for the helicopter's postwar utility. Larry Bell, Bell Aircraft's founder, imagined helicopters as the next automobile. If his vision were to come true, American families would fly—instead of drive—from home, to the bank, to supermarkets,

and back.<sup>258</sup> Journalist and politician Holmes Alexander's 1953 book, *Tomorrow's Air Age*, imagined that helicopters would be employed to tug jumbo passenger aircraft into the downtowns of busy metropolises. Manhattan officials envisioned the machines as a form of public transportation that would provide a solution to increasing traffic congestion.<sup>259</sup>

Such was the culture of techno-optimism that permeated American boardrooms and military bases at the turn of the Great Acceleration. Fossil-fueled machines were cast as a panacea for a host of problems regarding mobility and movement. While helicopters never ascended to the heights of utility that Larry Bell, Holmes Alexander, and others imagined, the aircraft was operated in the name of global development. Much like jeeps, helicopters were deployed as agricultural muscle beginning in the late 1940s. Farmers in the United States, Canada, Sweden, Argentina, and Great Britain purchased Bell Helicopters, not as airborne sedans, but as crop dusters.<sup>260</sup> Such technologies upped the energetic nature of America's farms, which had first begun to seriously industrialize in the 1920s.<sup>261</sup> As helicopters proliferated globally, they inevitably fostered factory farms in places other than the United States. Bell Helicopters, which were specifically used in RMNP's elk management efforts, also began to design their aircraft as ideal machines for oil and uranium prospecting. By the late 1960s, Petroleum Helicopters, Inc., originally an offshoot of Bell, commanded the largest commercial fleet of helicopters in the world. Much like jeeps, small aircraft also became essential tools in the postwar search for uranium in the largely road-less Colorado Plateau.<sup>262</sup> Aircraft helped facilitate new economic ventures on a global scale, including the massive earth-moving projects that stood at the center of industrial agriculture and mining.

Helicopters and jeeps, as novel machines that both consumed and worked to harvest and develop hydrocarbon fuels, shared much in common. This included their centrality to RMNP's elk management program. Heavy culling in the 1940s did not solve the problem of range degradation.

The park culled 507 elk in the 1950s, and while range conditions slightly improved, lethal control was becoming increasingly controversial, as the “culture of tourism,” which considered abundant elk the ultimate sign of the park’s natural vitality, clashed with qualitative and scientific evidence that the park’s other organisms were buckling under the pressure of too many elk. Park managers throughout the U.S. were increasingly viewing national parks as ecological wholes, which could no longer be simply managed for elk or for any single species.<sup>263</sup> Further controversy arose in 1961, when RMNP announced that it planned to cull 200 elk. The subsequent public brouhaha initiated a new elk management plan altogether. From that point forward, through the rest of the 1960s, the park worked in tandem with the Forest Service and the CDW to trap, tag, and study elk movement in and around the park.<sup>264</sup> The extent to which these efforts were carried out rested heavily upon the rotors of helicopters.

The cooperative study between the NPS, Forest Service, and CDW, required an extensive tagging program. Employees of each service worked together throughout the 1960s, trapping elk via a host of methods, and placing neckbands or ear clips on the animals. These bands were not electronic. RMNP would eventually implement radio tracking into its elk management plans. But in the 1960s, the vast majority of tracking bands were read manually, with each band replete with a unique combination of colors and geometric shapes. These collars were designed to be viewed from helicopter, which were rapidly employed for the purposes of tracking and counting elk herds in and around the park.<sup>265</sup> Helicopters and other small aircraft provided an aerial view that the park had simply not been able to economically utilize in the years before the Great Acceleration. Scientists working with RMNP’s elk championed this newfound bird’s eye view, arguing that non-aerial herd counts and vegetation surveys were obsolete in an age of small aircraft.<sup>266</sup> New carbon-fueled technologies powered this aerial view.

More striking, though, were the ways in which the speed and mobility of helicopters were coopted in efforts to both trap elk and “haze” them out of the park. Oftentimes park rangers, flying in commercial Bell helicopters with private pilots, aimed helicopters towards herds of elk, chasing them into large pens where they could be processed and tagged by park staff.<sup>267</sup> Elk tagging operations were rarely subtle. On at least two occasions in 1965, pilots swooped down upon calves, hovering their copters just above the young elk, allowing park staff to literally jump out of the aircraft and onto the calves. Terrified, the juvenile elk were wrestled to the ground and banded. Managers and their pilots would then make their way to their next objective. “Bulldogging” elk from the air was only possible with calves, but violence manifested in other forms during elk trapping.<sup>268</sup> There were numerous cases of elk breaking antlers while confined in pens. Others died of exhaustion as they struggled to escape, and still others broke legs and had to be shot.<sup>269</sup> This is not to say that park managers acted viciously or carelessly. The park advised rangers who worked in elk management to keep non-essential workers and visitors away from penned animals, as an attempt at creating calm. But this technologized, accelerated form of elk management preserved a certain violence at its core, in ways that culling did not. Elk were injured or died through their own distress, through reactions fostered by fossil fueled machines like helicopters.

An episode from 1967, one illustrative of the park’s effort to “haze” elk via helicopter, perhaps best illustrates the nonlethal violence which elk management often revolved around in the 1960s and 1970s. On the morning of September 2, a supercharged Bell helicopter operated by Pease-Hamilton Helicopters, Inc. of Denver, rose over the ridges which wind through central portions of the park, toward Specimen Mountain. Park staff had recently learned that a herd of 200 elk occupied the mountain’s slopes, just northwest of Trail Ridge Road. The plan was to herd the elk in a northeasterly direction, towards the Roosevelt National Forest and, importantly, toward

the waiting gunsights of private hunters. As the pilot approached Specimen Mountain, his observer, likely an employee of RMNP, guided him towards a group of twenty elk grazing along the mountain. At first, the helicopter seemed to drive the group of elk towards the waiting hunters. Quickly, though, the herd began to scatter, thwarting the hazing effort before it showed dividends. The estimation of 200 elk had been inaccurate, further undermining the park's attempted helicopter herding.<sup>270</sup>

In the aftermath of this failed episode, park service employees insisted that helicopter hazing worked. The pilot had been inexperienced. His observer noted that the pilot “seemed unable to maneuver his machine in the manner used by experienced ‘elk bushers.’”<sup>271</sup> A tested “elk busher” could have completed the task successfully. Furthermore, park officials argued that more helicopters were needed for such an operation. Public lands officials experienced in elk management “have indicated that two machines, flown by experienced pilots, are much better than one.”<sup>272</sup> Skilled helicopter pilots and a larger quantity of machines could help solve the elk issue definitively. Such an outlook seemed to paint RMNP as a miniature Vietnam, where helicopters were widely employed and became one of the indelible images of that Cold War-conflict. The application of novel, hydrocarbon-powered technologies born in the Great Acceleration were viewed as the solution to problems in a number of arenas, from Colorado to Southeast Asia.

The hunters who appeared at the margins of the previous story deserve focus in their own right. The CDW believed that the park service too easily dismissed hunting as a solution to RMNP's elk problem. The CDW profited from hunting licenses, so there were tangible incentives at stake regarding the park's elk problems.<sup>273</sup> When RMNP agreed to work with the CDW in assuaging the park's elk problems, they seemed to open the door to direct hunting in the park. That was not to be. The prospect of hunting within national parks was a national controversy, and an



issue that had beguiled the park service since its inception. Both white and Native American locals living near parks like Yellowstone and Glacier had resented the NPS's insistence upon closing traditional hunting grounds in the name of preservation. These groups often flouted hunting bans, especially in the early twentieth century when subsistence was still a day-to-day struggle for many people living in the American West.<sup>274</sup> This was not a new problem, and the NPS had always insisted that direct hunting within parks was not acceptable given the park service's preservationist impetus. The CDW and RMNP would massage this limitation, though, in part through initiatives like helicopter hazing.

The waiting hunters beyond the RMNP's boundaries were indicative of broader changes to the Front Range, though; shifts that went beyond the CDW or NPS and represented the Great Acceleration. Though doubtful of the possibility, park officials who blamed the failed "elk haze" on a lack of helicopters and pilot experience also noted that the presence of hunters and the noise of their vehicles may have helped stymie the park's effort.<sup>275</sup> The Great Acceleration had helped facilitate the hunters' vehicles in the first place. Indeed, while visitors to wilderness preserves like RMNP helped foster the carbon-fueled postwar connections between the urban Front Range and its mountain hinterlands, sportsmen also played a role in inspiring Colorado's flourishing infrastructure and tourist economy.

One of these sportsmen-conservationists, Arthur Carhart, was a tireless champion of conservation in Colorado. Originally a recreation engineer who worked for the Forest Service in the 1910s and 1920s, Carhart successfully advocated for the protection of some of the earliest wilderness areas located on Forest Service lands. Keen to wilderness' altruistic appeals, Carhart also argued for its utilitarian role in mainstream society. In supporting conservation, he highlighted hunters and the contributions they would make to the nation's economy, if only "wild" places like

Colorado remained open to their vehicles and weapons. Carhart “took an exceptionally keen interest in documenting the economic benefits of outdoor recreation,” writes historian William Philpott. “He wrote a series of pioneering articles in the 1940s and 1950s that attempted to quantify the surprisingly vast—yet, Carhart insisted, statistically verifiable—sums that recreational hunters and anglers were pouring into the American economy.”<sup>276</sup> Carhart exclaimed that, by 1950, hunters would spend \$9 billion per year on clothing, gasoline, and ammunition, among other accoutrements required for cross-country travel and subsequent hunting trips. Such estimations were exaggerated, to be sure, but Carhart embodied the effusive culture of prosperity and affluence which accompanied the technological and material changes wrought during the Great Acceleration. Widely-read throughout his career, his ideas would have been prevalent in conservationist communities at the time.

Colorado’s postwar tourist industry, beholden at every level to carbon-fueled mobility and interconnection, encouraged an ecological and economic situation whereby it made sense for the NPS to encourage and facilitate hunting. Boosters like Carhart undergirded the CDW’s calls to allow hunting in RMNP. While the park would not allow that, they would work to promote hunting adjacent to the park. RMNP managers and CDW officials organized out-of-season hunts adjacent to the park throughout the 1960s. These hunts were planned according to data collected via the aforementioned neckbands, which were affixed to elk and tracked via helicopter or automobile. The park also transferred trapped elk to the State of Colorado, which then distributed the animals throughout the state.<sup>277</sup> At times, hunters would kill transplanted elk which had once called Rocky home. Retrieved neckbands were then returned to the park.<sup>278</sup> These returned neckbands were the material artifacts that connected RMNP to a statewide, tourist-centric hunting venture that was implemented beyond the park’s boundaries. In supporting out-of-park hunting, RMNP encouraged

a commitment to the Great Acceleration in ways that transcended its borders. Helicopters and jeeps increasingly mediated the park's relationships with its elk, and such technologies also rendered the Rockies more accessible to middle-class hunters from across the country, and indeed from around the world.

### ***Ephemeral Elk: Radio Tracking and the Globalization of American Wildlife Management***

Radio transmitters were utilized as part of RMNP's elk management program as early as 1962. Developed in the late-1950s by wildlife biologists, with the support of the U.S. military and the Atomic Energy Commission, radio tracking devices quickly became important pieces of technology in the study and management of wildlife. The "wired wilderness," as historian Etienne Benson describes, which radio tracking devices created, wedded "Americans' fascination with the wild to their equally fervent enthusiasm for technology."<sup>279</sup> In this sense, radio tracking devices dovetailed with jeeps and helicopters as a technological fix to issues surrounding wilderness. Radio tracking also depended upon fossil-fueled machines and hydrocarbon-centric transportation infrastructures, as animals were most often tracked via radio from automobiles or aircraft.<sup>280</sup> Radio transmitters, though certainly not as carbon-belching as helicopters and jeeps, still depended upon connections to mineral energy systems. They also cohered with long-held American conceptions of nature as, in historian Peter Schmitt's words, "the playground of an urban society" that was best mediated via technology.<sup>281</sup> Sophisticated tracking devices like radio transmitters were also indicative of the ways in which American methods of wildlife management were increasingly exported on a global scale after 1945, and they represented a new chapter in the technologized mediation of nature. A globalized world helped exacerbate the Anthropocene and foster climate change in this period. Simultaneously, a global network of scientists, utilizing radio transmitters and even off-road vehicles, Americanized wildlife research on distant continents, forging new

connections between scientists and creating new ways of understanding the natural world on a global scale.

Radio transmitters were developed at the Cold War-induced nexus of military intelligence and academic research. Institutions like the Naval Research Laboratory developed wildlife-radio tracking in the 1950s as a means to address a number of issues, from the avoidance of shark attacks to improving missile guidance systems.<sup>282</sup> In the armed forces' eyes, investigations into the realm of radio and wildlife might provide ready solutions to problems that would inevitably arise for servicemen employed in a variety of strange environments by an expansive, "crusading," globalized military.<sup>283</sup> On the other hand, wildlife biologists considered radio tracking technologies to be a promising research device that would provide scientists with a more nuanced understanding of wildlife movement and distribution. Traditional neckbands, which before the late-1970s were the primary tracking device used in RMNP, were limited in nature. Researchers could not remotely watch banded animals if they were not wearing some sort of electronic transmitter. Elk behavior was tracked via collections of disconnected sightings made manually from automobile or helicopter. Deciding what an individual animal had been doing between sightings was an imperfect task. Radio transmitters promised a transcendence of these limits.

Radio tracking technologies were part of RMNP's elk management program in the 1960s, but available sources seem to indicate that its implementation within the park was limited at that time. The park's lead biologist, Neal Guse, noted in 1965 that "[l]imited radio-tracking equipment will be further investigated and used to delineate movements of individuals on critical winter range segments within the Park." In the same document, which outlined the ways in which the park utilized helicopters, automobiles, and fixed-wing aircraft in managing elk, Guse specifically requested equipment that could be assembled into radio transmitters which would then be attached

to individual animals.<sup>284</sup> Guse was obviously aware of radio transmitters and their efficacy as wildlife management tools; however, the park seemingly lacked the funding and connections which would have rendered radio tracking technologies more accessible.

Radio tracking devices increasingly found their way onto the necks of RMNP's elk, especially after 1975. Research done in the park after this period was tied to initial radio tracking programs which had been undertaken in Yellowstone beginning in the 1960s. Researchers collaring bears in Yellowstone during this period often experienced pushback from visitors and fellow wildlife biologists, who argued that clunky radio collars and colored tags, which were highly visible, ruptured the image of wildness which Yellowstone's animals were supposed to embody. But as the park service became increasingly concerned with overall ecosystem function, it supported radio and satellite telemetry-based research. Wildlife biologists and the public land agencies that employed them militated against an early-twentieth-century culture of management-for-scenery, and a focus by park staff upon only those organisms which attracted tourists. RMNP had learned the hard way that ecosystems were too complex for such tunnel vision. Radio telemetry, a technology born of the Great Acceleration and its amalgam of carbon-fueled war-making and academic science, offered a method for the nuanced study of large animals and the dynamic ways in which those animals interacted with the natural world.<sup>285</sup> Such technologies were not value-free. They undergirded a growing sense of the natural world as a network of interdependent energy flows, a system that asked humans to tolerate and help perpetuate nature's multivalence.<sup>286</sup>

In the years following the Second World War, Americans conceived ecology and the ecosystem concept as modern institutions that offered ways of thinking that meshed with wartime technologies and affluence. In the words of historian and ecologist Frank Benjamin Golley,

ecology “concerned systems, involved information theory, and used computers and modeling. In short, it was a machine theory applied to nature.”<sup>287</sup> Ecologists defined ecosystems based on energy flows, often applying the language and imagery of assembly lines to the mechanisms of natural systems. At the onset of the Great Acceleration, ecology still promised to provide a “holistic” understanding of nature’s workings, one commensurate with the God-like properties that many Americans still saw in the natural world.<sup>288</sup> In this sense, postwar ecology offered a millennialist, techno-optimist view of the world similar to that of helicopter salesmen, aerospace engineers, and highway planners. Radio telemetry directly fused technology with a conception of ecology that was already expressed through mechanistic thinking.

But radio tracking devices were never passive technologies. They helped produce original knowledge. By 1979, RMNP and the CDW preferred radio telemetry techniques when researching elk. That year, CDW biologist George Bear, working in tandem with RMNP, began a three-year process of trapping and tagging elk living in and around the park. By 1981, Bear and his colleagues had trapped 37 elk, affixing radio transmitters to eight animals and simple plastic tags to the remaining 29. Powered by lithium batteries with three- to four-year lifespans, the radio transmitters represented new technologies in the production of scientific knowledge regarding RMNP’s elk. Radio transmitters augmented continued herd counts made from the air, and elk were best tracked via radio by automobile. Through changes in radio signals, Bear and his team determined the various body positions which tagged elk established throughout the day. From there, they tracked how much time elk spent foraging, resting, and moving from range to range. Such studies allowed biologists to better understand the day-to-day activities of elk in the park, and the dynamics of overgrazing, which continued to plague RMNP. Bear estimated that as many as 3,000 elk wintered in RMNP in 1982. A large herd like this had a “definite effect upon the plant community,” as it

browsed meadows to ground level and stripped bark from mature aspen trees, harming those plant species in the process. Perhaps most interesting was Bear's assertion that RMNP's elk population mixed and flowed with nearby groups of elk.<sup>289</sup> Radio telemetry technologies had facilitated the production of this plethora of knowledge regarding Rocky's elk.

At the same time, radio tracking of wildlife became increasingly global, involving the intermixing of American scientific institutions and non-Western ecologists and wildlife biologists. Much like the Great Acceleration helped to, ironically, foster wilderness appreciation amongst Americans, it also created the conditions whereby scientists learned to understand the planet's natural systems on a global scale. The engines of climate change—notably fossil-fueled transportation networks and the university-military-industrial complex—made possible the production of global scientific institutions equipped to understand global climate change and the Anthropocene. After World War II, wildlife tracking technologies—including jeeps and radio transmitters—were exported around the globe. Not only did these American-based technologies proliferate, but wildlife biologists in underdeveloped countries also relied upon funding and training from American institutions.

The flourishing of technologized research, such as what occurred in RMNP after World War II, rendered the United States the global community's scientific center. For instance, historian Michael Lewis, who studies wildlife research in India, notes that Indian wildlife biologists, through the use of western technologies like radio collars, gained access to western channels of scientific research and legitimized their work in the eyes of editors of western academic journals.<sup>290</sup> Indian researchers depended upon American jeeps, American radio equipment, American training, and access to American journals like the *Journal of Wildlife Management*, where George Bear published his findings regarding RMNP's elk. These institutional connections legitimized Indian

researchers in the eyes of deep-pocketed, Western funders. In turn, Indian researchers perpetuated, not without controversy, the establishment of American-style conservation and American-style national parks in their own country.<sup>291</sup> Globalization, in many ways, homogenized wildlife conservation and research, and rooted wildlife science in a set of quasi-military technologies which were first imagined in the United States in the wake of the Second World War.

With this in mind, we can understand the Great Acceleration as more than just a global-scale change in humans' relationships with inorganic fuel sources and with nonhuman nature. It was also a period accentuated by the globalization of scientific ideas, and a period when scientists began to understand the Earth's natural systems at a global level. Satellite-based wildlife tracking serves as a good example of this urge and subsequent ability to understand the natural world on a planetary scale. The tracking of wildlife via satellite grew out of initial research into radio-tracking technologies. In Etienne Benson's words, wildlife biologists viewed satellite-tracking as a surveillance system that "would make possible the comprehensive, continuous, objective observation of 'motile' responses of animals to their environment on a global scale."<sup>292</sup> Globalization fostered a desire to understand nature globally. Likewise, climate change itself only became knowable to the scientific community after the post-WWII creation of a global network of meteorologists, championed by scientists located around the world, who produced massive catalogs of climate data that could only be synthesized via supercomputer.<sup>293</sup> Such computers, energized by coal-fired power plants, built of plastic and copper, are creations of a carbon-dependent society.

As we have come to understand the Anthropocene, we have also in part advanced it, and vice versa. RMNP's wildlife played their own role in this globalizing process. Today, RMNP actively exchanges management ideas with the Tatra National Parks located in Poland and



Slovakia, which share with RMNP similar ecosystems, ungulates, and anthropocentric challenges. Furthermore, RMNP is a sister park to a number of preservation areas located in Costa Rica, a country whose parks were heavily influenced by the American national park idea, and whose park managers have often been trained in the United States.<sup>294</sup> Such connections, forged by post-WWII internationalism, have their own place in the history of the Great Acceleration.

***Conclusion: Reconsidering RMNP and its Elk in the Anthropocene***

Seen through the lens of the Great Acceleration, RMNP's elk appear, in some ways, conspicuously un-wild. Surveyed and herded by helicopter, viewed from family sedans, and harvested by jeep, the carbon-fueled technologies that increasingly proliferated in and around the park after 1945 have played an indelible role in elk life. Even before World War II, park managers were celebrating tame elk and their propensity for grazing within sight of auto-tourists. Roads continued to shape elk mobility and behavior throughout the twentieth century. Elk retreated from roads at certain times of day as the animals gradually associated highways with culling. George Bear noted how elk grazed right alongside roadways at night but not during the day, revealing that they were at least tacitly afraid of noisy automobiles, if not completely adverse to their presence.<sup>295</sup> At the very least, elk were well aware of fossil-fueled machines, and their behavior was in part a product of those technologies. Beyond RMNP, elk mobility was increasingly dictated by urban development around the park. And as more and more people entered the park and laid eyes on elk, non-lethal management became a political imperative. Caught in a complex amalgam of human ideas and institutions—each rooted in cheap fossil energy—elk were pulled this way and that (sometimes literally), often in the name of anthropocentrism.

Therefore, a story of elk's un-wilding could be discerned from this period in RMNP's history, but I view such a story as part of a politically threatening proposition which the

Anthropocene concept often elicits. That proposition being: if all nonhuman nature on Earth is in fact touched in some way by human activity, then how can “wilderness” exist at all? Such a question raises uncertainties about wilderness places like RMNP which should make all people wary. Wilderness, as a political ideal, has gone a long way in saving millions of acres of land and water from resource exploitation and full-scale development. Regardless of whether or not parks like RMNP and the organisms they harbor can be considered “pristine,” their continued existence points to the utility of wilderness as a political idea. People want to see elk, regardless of the human decisions and desires that they embody. People want to experience solitude, even if it could be discerned as artificial. People want to be physically challenged, and they even want to feel fear as they are immersed in a nominally “wild” place. True, one way to reconsider elk in the Anthropocene is to challenge their wildness altogether.

But this is not the only narrative that this new epoch should foster. In response to the concept of the Anthropocene, historian and environmental humanist Curt Meine has articulated the idea of the “relative wild,” a notion that does not sacrifice wilderness in the name of an ostensibly human-made world, and one that is useful in reconsidering RMNP and its elk through the lens of the Great Acceleration. In Meine’s words, considering the “relative wild”—or thinking about wildness as an attribute that exists along a continuum—illuminates the “degrees of wildness and human influences in any place, and the ever-changing nature of the relationship between them over time.”<sup>296</sup> Studied, tracked, trapped, and even herded by humans and their machines, elk, at times, almost appeared domesticated. But their wildness endured, especially when they ventured beyond the park’s boundaries and challenged the erection of highways and suburban lawns in areas that had once been rangeland. Their wildness persisted in their struggle to survive in increasingly anthropocentric landscapes, even as humans became elk’s indirect caregivers. And even if humans

ultimately dictated where elk could realistically reside in northern Colorado during the Great Acceleration, the human impetus for perpetuating elk's survival emanated from a desire to preserve an evolutionary process that transcends resource extraction or economic exploitation. Through elk, humans articulated a relationship with the natural world that accepted the need for management of wilderness, while rejecting the tendency to embrace humans' ability to transform the natural world for human-centric reasons.<sup>297</sup> RMNP's elk are not easily classified when viewed through the lens of the park's postwar history. But their wildness endured and continues to endure, even as that wildness has become relative and contingent upon human-led management.

More broadly, though, the concept of the "relative wild" is perhaps most useful as a tool for reconsidering RMNP and the lands that lie adjacent to it. Throughout this thesis, I have tried to break down RMNP's political borders and reveal their porousness. From a scientist's vantage point, the park's inability to contain its natural organisms, notably elk, is predictable. But within popular discourse, national parks like RMNP are still often considered islands of wilderness dotting a sea of urban-industrial development. RMNP's elk force us to rethink this assumption, though. It will likely become necessary in the coming years if humans want to continue preserving large wild animals like elk. Protected areas like RMNP simply do not consist of enough land and resources for elk to thrive. Rocky is a classic example of a set of landscapes that were originally protected for their scenery, not for their ecological status.<sup>298</sup> The park can harbor its elk for portions of the year, but not perpetually, in part because it was not originally delineated with elk habitat in mind. There are ways in which we can organize the private lands beyond RMNP so that elk are not so constrained, a venture that could alleviate problems across northern Colorado's mosaic of public parks and forests, residential areas, rural ranch and farmland, and cities. We can consider

these areas along a continuum of wildness, a mental exercise that might facilitate a reconsideration of how our private, urban-industrialized living spaces interact with RMNP and its elk.<sup>299</sup>

Aldo Leopold's ideas lend credence to such reconsiderations of human relationships with the landscape. Meine's concept of the "relative wild" draws heavily upon Leopold's land ethic, which outlined Leopold's vision for a reformed, bio-centric ethos whereby humans would live by nature while still respecting its nonhuman organisms and its non-anthropocentric processes. A forester and contemporary of Arthur Carhart's, Leopold rejected Carhart and other foresters' utilitarianism. Leopold articulated an overarching land ethic which called on humans to change their role "from conqueror of the land-community to plain member and citizen of it."<sup>300</sup> He rejected the notion that the natural world should only be considered in economic terms, arguing that human morality sprang from its relationship with the land. Leopold articulated his ethos at the onset of the Great Acceleration, but its importance has only grown in recent years. As human populations increase, we inevitably begin to tax more natural resources, and our human-centric landscapes encroach upon and interact with more and more wildland. Leopold vehemently argued for conservation that occurred across the landscape, not just on public lands.<sup>301</sup> Today, activists and scientists calling for "corridor conservation," or the reconnection of fragmented landscapes through the simultaneous management of public, private, and communal lands, espouse the foundational ideas behind Leopold's land ethic.<sup>302</sup> Such conservation strategies have become increasingly crucial in a finite world that is the host to seemingly infinite human growth. Applying Leopold's land ethic to the real world has become all the more vital in the Anthropocene.

Reconsidering RMNP and its elk from this vantage point fosters a humbler view of the Anthropocene, where nuance replaces rigidity and where a politics that exists somewhere between primitivism and anthropocentrism can be fostered. In Meine's words, the "relative wild" might

help us “dim the sharp boundary lines we are prone to see between our human and natural communities,” while continuing to allow us to “appreciate the shades of contrast we can discern there.”<sup>303</sup> RMNP’s elk certainly blur the lines between the wild and domesticated. If they occupy a category at all, it is one that has not yet been created. Such blurring can be informative, and can help us to see with clarity the often arbitrary and conflicting values we attach to certain landscapes, and the limiting effect that such perspectives create.

## **Conclusion: Ecomodernism's Discontents**

The Great Acceleration, an era of unprecedented human activity, mass decision-making, and rampant globalization, has given way, in the twenty-first century, to political gridlock, despondency, and anger. The inertia that postwar, carbon-fueled prosperity has created is seemingly unstoppable. When the specter of anthropogenic climate change first arose in the late-1980s, scientists and policy makers believed that both private and public institutions would champion the creation of sustainable energies, thus directly solving the problem of human-induced global warming. Instead, efforts to solve the modern world's carbon dependencies have broken down time and again. Industrialization in developing countries like China and India have exacerbated atmospheric CO<sub>2</sub> levels, but even "modernized" countries like the United States have been slow to address the atmospheric problems of carbon-based fuel. Because the global community has failed to rapidly divest itself of hydrocarbons, new strains of techno-optimism have emerged as a response to an uncertain future. In recent years, a cadre of geo-engineers and "ecomodernists," claiming to provide highly-technologized solutions to degraded ecosystems and carbon-saturated skies, have stepped onto the stage of environmental politics. The science behind geo-engineering schemes is still dubious. But of even more relevancy here are the ethics behind those schemes, and the ways in which the history and present-day management of public lands like RMNP can inform the ethical discussions regarding proposed approaches to climate change prevention and mitigation.

The title "geo-engineering" is straightforward enough: geo-engineers hope to engineer Earth's climate in hopes of mitigating the effects of climate change. Geo-engineers tend to focus either on the artificial removal of carbon dioxide from the atmosphere or solar radiation

management techniques that seek to decrease the amount of sunlight that enters Earth's atmosphere. Such schemes are band-aids, ultimately; technologized solutions that do not address fossil fuel dependency, but attempt to mask or compensate for the symptoms of that dependency. Proposed geo-engineering projects vary, from cutting down northern boreal forest in an attempt to increase the snowy ground's reflectivity, to covering mountains in white slurries of water, sand, and lime, also in an attempt to induce reflectivity and lower temperatures. Some scientists have even proposed altering the Earth's orbit around the sun to induce the onset of cooler climates.<sup>304</sup> Geo-engineering projects like these reflect the very hubris that was embedded in post-WWII techno-optimism, which made its way into the NPS and RMNP through the mass building of infrastructure and the park service's belief in the management of visitors via that infrastructure. The detriments of overcrowding that the parks experienced after the war were limited to relatively small spaces such as RMNP and the landscapes surrounding it; however, scaling-up this attitude of techno-optimism to the globe's climate would likely lead to unforeseen consequences that would imperil the entire planet, not just specific localities. But it should not be a complete surprise that such schemes find favor. Geo-engineering, in Clive Hamilton's words, "dovetails perfectly with the modernist urge to exert control over nature by technological means."<sup>305</sup>

Geo-engineering is in part a practical outgrowth of "ecomodernism," an influential environmental ethic which has developed in recent years around the concept of the Anthropocene. The ecomodernists, who primarily consist of activist-scientists affiliated with the Breakthrough Institute, a progressive think-tank that envisions an ecologically vibrant planet managed through technology, believe "that knowledge and technology, applied with wisdom, might allow for a good, or even great, Anthropocene."<sup>306</sup> The ecomodernists published a controversial manifesto in 2015 which outlined their philosophy regarding energy, technology, and the natural world. In

envisioning a “great Anthropocene,” the ecomodernists foresee a highly technocratic managerial enterprise that, through technological innovation, will “decouple” humanity from the natural world. Essentially, human-created technologies, when harnessed within the framework of well-managed global political institutions, will work so efficiently that they will remove humans from the ecosystems which we have degraded through overreliance. In their own words:

“Intensifying many human activities — particularly farming, energy extraction, forestry, and settlement — so that they use less land and interfere less with the natural world is the key to decoupling human development from environmental impacts. These socioeconomic and technological processes are central to economic modernization and environmental protection. Together they allow people to mitigate climate change, to spare nature, and to alleviate global poverty.”<sup>307</sup>

In spelling out this millennialist vision for the planet, the ecomodernists reject the notion “that human societies must harmonize with nature to avoid economic and ecological collapse.”<sup>308</sup> In their eyes, humans have made the planet into its present form, and in the process have created the Anthropocene. As a result, the planet is ours to manage and control for our own sake. In “decoupling” humanity from nonhuman nature, people save both themselves and the organisms that inhabit our planet.

The notion of “decoupling,” or of imagining humans as apart from nature, is already a deep-seated idea in the Western world, a notion that has helped propel the idea that humans can compartmentalize the material world into separately defined silos. Indeed, the very existence of national parks like RMNP indicate humans’ tendency (whether it be a “modern” institution or something more enduring) to set aside space in units that, on paper, can be easily controlled and isolated. I have shown how a well-defined place like RMNP interacts in myriad ways with its surroundings, hopefully to the point of blurring the park’s physical and cultural boundaries. Yet



ideas like the decoupling of humans from nature amplify this tendency to limit our conception of space and human interactions with wildlife across space. The efficacy of such an ethos is, in many ways, unwarranted and harmful. Ecomodernism takes to the extreme the notion of humanity separating itself from the natural world. It feeds on Americans' long-established notions of space and place: we work in cities or rural areas, live in these same areas, or perhaps in suburbs, and we escape once or twice a year to places like RMNP. In a society that legally and materially differentiates between its residential, commercial, and public spaces, Americans already adhere to a form of decoupling that helps preclude people from developing an ethic of production and consumption that connects our day-to-day practice of energy exploitation with the myriad spaces that help filter the values, technologies, and crude forms of fuel that we use. In essence, such a spatial regime militates against the establishment of a land ethic that resembles Aldo Leopold's notion of the "land community."

Engrained in the idea of decoupling are silences and obfuscations, and ultimately the implication that humans have mastered what it is they are separating themselves from. Such an attitude is a spite to humility and reflects the arrogance that has created the environmentally-addled planet that ecomodernists would like to escape. For instance, the ecomodernists see cities as dense, definable centers of human ingenuity and energy harnessing. Through living in cities, and producing and consuming the inorganic resources that cities might provide, decoupling will be achieved. Anthropocentrism will be realized only in the most anthropocentric of landscapes. Yet such a life of spatial confinement robs people of the moral lessons that illuminate the planet's landscapes and its nonhuman creatures. Where do RMNP's elk ultimately fit in ecomodernism's ultra-urban society? Ecomodernism argues that it is direct human exploitations of ecosystems—for food and fuel—which threaten organisms like elk. Yet this story does not hold true in RMNP's

case. Subsistence and market hunting, which the ecomodernists decry, have not threatened northern Colorado's elk in over a century. It is urban sprawl that threatens those animals today. RMNP's elk would be better off if we foresaw an Anthropocene where humans consider and manage their landscapes and ecosystems as holistically networked and perpetually interacting wholes, where institutions like political borders are negotiated in the name of coupled human and nonhuman biological function. RMNP's elk do not see themselves as RMNP's elk, and perhaps people should not define them in such terms either. Yet the "decoupling" which the ecomodernists envision is the ultimate form of compartmentalization, where there exists no gray areas, hard decisions, or the moral lessons that are expressed in stories of extinction or other narratives about the interactions humans experience with the nonhuman world.<sup>309</sup>

The ecomodernists are right to conflate conservation with technology. For instance, helicopters and jeeps were essential tools used to meet RMNP's management goals after World War II. But managing nature via technology should not preclude people from developing a collective ethos which considers humanity as an indelible part of the landscapes and ecosystems that we occupy and use. Ecomodernism purports to encourage the perpetuation of "conservation politics and a wilderness movement."<sup>310</sup> Yet, the ecomodernists ignore the ways in which such movements arise out of specific material contexts, and out of an often blurry mixture of environment and culture. How humans come to appreciate nonhuman nature is not simply a product of internalized ideas. Humans develop environmental ethics through labor as surely as they do through recreation or through intellectual meditations concerning natural aesthetics. RMNP reflects this often messy process whereby people come to know, appreciate, and define ephemeral concepts like wilderness. The park rangers who "bulldogged," tagged, and even shot elk came to appreciate the nonhuman nature around them, even as they implemented a certain heavy-handed

form of management. Estes Park residents protected wild soundscapes through economic calculations, fearing a loss of business if machines continued to disturb the skies above the park. And even those who enjoyed skiing in Hidden Valley came to appreciate the ski area's closure, respecting the park service's preservation mission, and even feeling moved by experiencing the same landscape juxtaposed over time, between ski resort and undeveloped wilderness.<sup>311</sup> Removing humans from nature inhibits such experiences. In this thesis, I have tried to show how technological change has reshaped how people work in, move through, and conceptualize RMNP. In a decoupled world, technology precludes humans from getting to know nonhuman nature in dynamic and at times challenging ways.

Ultimately, the ecomodernist vision lacks any room for humans to develop empathy towards nonhuman nature. In this lack of empathy towards nature is also engrained the insistence that humility is a moral trap, that it is a notion that only incites self-limiting guilt. But humility can be a useful virtue, one that forces us to consider unforeseen consequences and to accept the possibility of failure, in turn fostering flexibility as a necessary virtue. The NPS already employs such a management ethos in the form of "adaptive management." Adaptive management, in broad terms, involves the management of ecosystems with the goal of reducing uncertainty regarding the function of specific natural systems over time. As management goals are met, managers gradually learn more and more about the system in question. For instance, present day wildlife managers working to restore RMNP's beaver populations through elk and vegetation management do not commit to concrete, command-and-control attitudes with only beaver proliferation in mind. Beavers are not aimlessly set free to roam the park's valley marshes at will. Rather, steps are taken gradually to manage the whole ecosystem so that, holistically, it can function as a host to beavers, elk, willow, aspen, and human visitors alike. An adherence to patience and an acceptance of

flexibility are built into the logic of adaptive management, something absent from the values which underpin ecomodernism.

Thus, public lands agencies like the NPS already employ a land ethos that could be applied to the terrestrial world in broader ways, especially in an atmosphere of uncertainty and no-analog natural conditions, which the Anthropocene will foster. Such holistic forms of ecosystem management could very well become necessary as the planet's climate grows more volatile and unpredictable. Adaptive management is, I believe, a useful ethic for managing nature because of the humility that is embedded in its mechanics. Parks like RMNP have taught many people to appreciate wild places and nonhuman creatures. They have helped create a sense of human empathy towards nonhuman nature. Adaptive management in part fuses this sense of empathy and humility to the processes of ecosystem management. In this philosophy is rooted a moral counter to the techno-optimism of ecomodernism: that humans can manage and promote biodiversity—and perhaps other aspects of human-nature systems—without giving into command-and-control anthropocentrism. Better yet, I believe adaptive management's more humble approach represents its ultimate utility. Flexibility will likely be a key virtue when living in a world with unpredictable temperatures, weather, and displaced human populations living in constant flux. In this sense, the parks' adherence to adaptive management perhaps offers all people new lessons as the planet moves into precarious times.

RMNP is more than a place on a map, framed by political borders meticulously spelled out in pieces of federal legislation and delineated on two-dimensional maps. It is a mixture of ideas and materials, always interacting with an interwoven system of human infrastructure, animal mobility, and climate. Modern machines, almost always fueled by hydrocarbons, have facilitated both human visitation to the park and human management of the park's natural resources. This

history of technology and nature is often messy and seemingly contradictory. But in employing modern, carbon-belching technologies in the name of wilderness advocacy and management, RMNP's staff, visitors, and stakeholders have more often than not done so honestly, and with nonhuman nature in mind. The United States' national parks certainly have a capitalist background. The parks were founded in close cooperation with sprawling corporations like the railroads, and they continue to be envisioned as engines of economic growth. But this history does not tell a fuller story in which local residents, auto-tourists, and rangers worked in myriad ways to perpetuate the evolutionary functions that the park harbors, which can be readily experienced and interpreted by the public.

Ultimately, RMNP's postwar history illuminates a broader mainstay of the global history of the Great Acceleration. In employing fossil-fueled systems of transportation and communication, humans have come to both harm and appreciate nonhuman nature. Humans have also come to understand their global impact through the well-oiled gears of globalization. Such a story does not provide black-and-white explanations that can be molded into easy blame. Much like adaptive management, such a messy history requires flexibility in understanding how embedded our current energy regime is in nearly everything we do. RMNP's history illuminates this fact. It also provides hope that people can continue to pursue the preservation of material places that transcend human lives and concerns about "usefulness" and production, even as the human footprint grows upon Earth, and especially as new strains of human-centric techno-optimism enter environmental discourse.

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## Notes

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- <sup>2</sup> This website provides both overview and detail on what exactly the Anthropocene is: <http://quaternary.stratigraphy.org/workinggroups/anthropocene/>.
- <sup>3</sup> For high-modernism, see James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven, CT: Yale University Press, 1998).
- <sup>4</sup> Will Steffen, Jacques Grinevald, Paul Crutzen, and John McNeill, “The Anthropocene: Conceptual and Historical Perspectives,” *Philosophical Transactions: Mathematical, Physical, and Engineering Sciences* 369, no. 1938 (March 2011): 842-43, accessed January 15, 2016, <http://www.jstor.org/stable/41061703>.
- <sup>5</sup> Timothy J. LeCain, *Mass Destruction: The Men and Giant Mines that Wired America and Scarred the Planet* (New Brunswick, NJ: Rutgers University Press, 2009), 10.
- <sup>6</sup> Angus Chen, “Rocks Made of Plastic Found on Hawaiian Beach,” *Science*, June 4, 2014, accessed January 15, 2016, <http://www.sciencemag.org/news/2014/06/rocks-made-plastic-found-hawaiian-beach>.
- <sup>7</sup> Steffen, Grinevald, Crutzen, and McNeill, “The Anthropocene: Conceptual and Historical Perspectives,” 843; See Elizabeth Kolbert, *The Sixth Extinction: An Unnatural History* (New York: Henry Holt and Company, 2014).
- <sup>8</sup> Kolbert, *The Sixth Extinction*, Kindle edition, 104-05.
- <sup>9</sup> Jan Zalasiewicz, *The Earth After Us: What Legacy Will Humans Leave in the Rocks?* (New York: Oxford University, 2008), 165-72.
- <sup>10</sup> Clive Hamilton, Françoise Gemenne, and Christophe Bonneuil, eds., *The Anthropocene and the Global Environmental Crisis: Rethinking Modernity in a New Epoch* (London: Routledge, 2015), 2.
- <sup>11</sup> Dipesh Chakrabarty, “The Climate of History: Four Theses,” *Critical Inquiry* 35, no. 2 (Winter 2009): 208, accessed January 14, 2016, DOI: 10.1086/596640.
- <sup>12</sup> Fredrik Albritton Jonsson, “The Industrial Revolution in the Anthropocene,” *The Journal of Modern History* 84, no. 3 (September 2012): 680-81, accessed January 14, 2016, DOI: 10.1086/666049.
- <sup>13</sup> Donald Worster, “The American West in the Age of Vulnerability,” *Western Historical Quarterly* 45, no. 1 (Spring 2014): 11, accessed January 14, 2016, <http://www.jstor.org/stable/westhistquar.45.1.0004>.
- <sup>14</sup> Fernand Braudel, *The Mediterranean and the Mediterranean World in the Age of Philip II* (Berkeley: University of California Press, 1996), 3-5.
- <sup>15</sup> Chakrabarty, “The Climate of History,” 201.
- <sup>16</sup> Chakrabarty, “The Climate of History,” 206-07.
- <sup>17</sup> Robert Costanza, Lisa J. Graumlich, and Will Steffen eds., *Sustainability or Collapse? An Integrated History and Future of People on Earth* (Cambridge, MA: MIT Press, 2007), 3-5.
- <sup>18</sup> Steffen, Grinevald, Crutzen, and McNeill, “The Anthropocene: Conceptual and Historical Perspectives,” 849-53, accessed January 14, 2016, <http://www.jstor.org/stable/41061703>.
- <sup>19</sup> Rocky Mountain NP Annual Visitation Statistics, accessed January 15, 2016, [https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20\(1904%20-%20Last%20Calendar%20Year\)?Park=ROMO](https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20(1904%20-%20Last%20Calendar%20Year)?Park=ROMO).
- <sup>20</sup> Jerry J. Frank, *Making Rocky Mountain National Park: The Environmental History of an American Treasure* (Lawrence: University Press of Kansas, 2013), 41.
- <sup>21</sup> Thomas G. Andrews, *Killing for Coal: America’s Deadliest Labor War* (Cambridge, MA: Harvard University Press, 2008), 15-16.
- <sup>22</sup> Brian C. Black, *Crude Reality: Petroleum in World History* (Plymouth, UK: Rowman and Littlefield, 2012), 67-72.
- <sup>23</sup> See David Ekbladh, *The Great American Mission: Modernization and the Construction of an American World Order* (Princeton, NJ: Princeton University Press, 2010).

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- <sup>24</sup> James T. Sparrow, *Warfare State: World War II Americans and the Age of Big Government* (New York: Oxford University Press, 2011), 44.
- <sup>25</sup> For fossil fuels and their role in creating material conditions which allowed for preservation, see Bob Johnson, *Carbon Nation: Fossil Fuels in the Making of American Culture* (Lawrence: University Press of Kansas, 2014).
- <sup>26</sup> Richard West Sellars, *Preserving Nature in the National Parks* (New Haven, CT: Yale University Press, 1997), 180-84.
- <sup>27</sup> See Edward Abbey, *Desert Solitaire* (New York: McGraw-Hill, 1968).
- <sup>28</sup> Maren Thompson Bzdek and Janet Ore, *The Mission 66 Program at Rocky Mountain National Park* (Fort Collins, CO: Public Lands History Center, 2010), 3.
- <sup>29</sup> Thompson Bzdek and Ore, *The Mission 66 Program at Rocky Mountain National Park*, 3, 8-9.
- <sup>30</sup> Cited in Sellars, *Preserving Nature in the National Parks*, 181.
- <sup>31</sup> Paul W. Hirt, *A Conspiracy of Optimism: Management of the National Forests since World War Two* (Lincoln: University of Nebraska Press, 1994), xxii-xxiii.
- <sup>32</sup> Worster, *Rivers of Empire: Water, Aridity, and the Growth of the American West* (New York: Pantheon, 1985), 7.
- <sup>33</sup> Vaclav Smil, *Two Prime Movers of Globalization: The History and Impact of Diesel Engines and Gas Turbines* (Cambridge, MA: MIT Press, 2010), 158-59.
- <sup>34</sup> Charles Wilkinson, *Fire on the Plateau: Conflict and Endurance in the American Southwest* (Washington D.C.: Island Press, 1999) xii, 178-85.
- <sup>35</sup> William Philpott, *Vacationland: Tourism and Environment in the Colorado High Country* (Seattle: University of Washington Press, 2013), 99.
- <sup>36</sup> "Intercensal Estimates of the Total Population of States: 1950-1960," United States Census Bureau, accessed April 22, 2016, <https://www.census.gov/popest/data/state/asrh/1980s/tables/st5060ts.txt>.
- <sup>37</sup> "Intercensal Estimates of the Total Population of States: 1960-1970," United States Census Bureau, accessed April 22, 2016, <https://www.census.gov/popest/data/state/asrh/1980s/tables/st6070ts.txt>.
- <sup>38</sup> "1970 Census of Population," United States Census Bureau, accessed April 22, 2016, <http://www.census.gov/prod/www/decennial.html>.
- <sup>39</sup> Thomas A. Thomas, "Roads to a Troubled Future: Transportation and Transformation in Colorado's Interstate Highway Corridors in the Nineteenth and Twentieth Centuries," PhD diss., (University of Colorado, 1996), 3-4, 118-27, 130, 140, 164, 167; Owen Gutfreund, *Twentieth-Century Sprawl: Highways and the Reshaping of the American Landscape* (New York: Oxford University Press, 2004), 90, 97, 126. For Denver and its nineteenth-century relationships with its mountainous hinterland, see Andrews, *Killing for Coal*. Andrews makes the important point that before coal began to be systematically pulled from the Rocky Mountains, and before coal-powered railroads traversed Colorado, the region was economically destitute. The extraction of coal, as well as coal-fired technologies, were vital modernizing forces, highlighting the centrality of fossil fuels to the development of the American West.
- <sup>40</sup> Mark Harvey, "Loving the Wild in Postwar America," in *American Wilderness: A New History*, ed. Michael Lewis (New York: Oxford University Press, 2007), 187-88.
- <sup>41</sup> M. A. Franke, et al., "Natural Resource Vital Signs at Rocky Mountain National Park," Natural Resource Report NPS/ROMO/NRR—2015/946 (Estes Park, CO: Rocky Mountain National Park, 2015), accessed April 29, 2016, [https://www.nps.gov/romo/learn/upload/ROMO\\_VitalSigns\\_040815.pdf](https://www.nps.gov/romo/learn/upload/ROMO_VitalSigns_040815.pdf); T. C. McDonnell, et al., "Modeled Subalpine Plant Community Response to Climate Change and Nitrogen Deposition in Rocky Mountain National Park," *Environmental Pollution* 187 (April 2014).
- <sup>42</sup> Sellars, *Preserving Nature in the National Parks*, 169-70.
- <sup>43</sup> See David Glassberg, "Place, Memory, and Climate Change," *The Public Historian* 36, no. 3 (August 2014): 17-30.
- <sup>44</sup> C. W. Buchholtz, *Rocky Mountain National Park: A History* (Boulder: Associated University Press of Colorado, 1983), 212.
- <sup>45</sup> Will Steffen, Paul J. Crutzen, and J.R. McNeill, "The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature?" *Ambio* 36, no. 8, (December 2007): 617-18.
- <sup>46</sup> The "Earth system" can be defined as a concept "that views the Earth as a total entity, stretching from its core to the upper atmosphere, in an unceasing state of flux driven by energy and material cycles." Many Earth system scientists argue that the planet has entered the Anthropocene, an epoch where the various natural systems which can be subsumed under the "Earth system" concept are being primarily shaped by human activity. Hamilton, Gemenne, and Bonneuil, *The Anthropocene and the Global Environmental Crisis*, 2.
- <sup>47</sup> See Bruce J. Schulman, "Governing Nature, Nurturing Government: Resource Management and the Development of the American State, 1900-1912," in *Journal of Policy History* 17, no. 4 (October 2005): 375-403.

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<sup>48</sup> On “legibility,” see Scott, *Seeing Like a State*.

<sup>49</sup> Scientists have recently begun measuring automobile noise in RMNP and its effect on hikers. Researchers found that hikers would have to walk over a half-mile past all trailheads adjacent to Bear Lake Road in order to experience “natural quiet,” defined as less than 25 decibels. Logan Park et al., “Modeling and Mapping Hikers’ Exposure to Transportation Noise in Rocky Mountain National Park,” *Park Science* 26, no. 3 (Winter 2009-10): 59-63.

<sup>50</sup> R. Murray Schafer, *The Soundscape: Our Sonic Environment and the Tuning of the World*

(Rochester, VT: Destiny, 1994), 86.

<sup>51</sup> “Rocky Mountain NP,” Park Report, National Park Service Visitor Use Statistics, <https://irma.nps.gov/Stats/Reports/Park/ROMO>.

<sup>52</sup> Frank, *Making Rocky Mountain National Park*, 33. For perspective on roads in other parks, see David Louter, *Windshield Wilderness: Cars, Roads, and Nature in Washington’s National Parks* (Seattle: University of Washington Press, 2006).

<sup>53</sup> Cori Knudten, “A Diminishing Shadow: Longs Peak and Auto Tourists in Postwar Rocky Mountain National Park” (M.A. thesis., Colorado State University, 2009.), 4, 27.

<sup>54</sup> Buchholtz, *Rocky Mountain National Park*, 193; Frank, *Making Rocky Mountain National Park*, 101.

<sup>55</sup> James Pickering, *America’s Switzerland: Estes Park and Rocky Mountain National Park—the Growth Years* (Boulder: University Press of Colorado, 2005), 380.

<sup>56</sup> U.S. Congress, *An Act to Establish the Rocky Mountain National Park in the State of Colorado, and other Purposes*, January 26, 1915, 63<sup>rd</sup> Cong., 3<sup>rd</sup> sess., 798-800.

<sup>57</sup> “Highway Map of Colorado,” produced by Skelly Oil Company, unmarked box, Estes Park Museum, Estes Park, CO; “Highway Map: Colorado,” produced by Standard Oil Company, unmarked box, Estes Park Museum, Estes Park, CO.

<sup>58</sup> Christopher W. Wells, *Car Country: An Environmental History* (Seattle: University of Washington Press, 2012), 220.

<sup>59</sup> Johnson, *Carbon Nation*, 23; Andrews, *Killing for Coal*, 78.

<sup>60</sup> “Rocky Mountain NP,” Park Report, National Park Service Visitor Use Statistics, <https://irma.nps.gov/Stats/Reports/Park/ROMO>.

<sup>61</sup> Frank, *Making Rocky Mountain National Park*, 44.

<sup>62</sup> Thomas, “Roads to a Troubled Future,” 125-27, 130-31, 164-67.

<sup>63</sup> “National Transportation Statistics,” Bureau of Transportation, accessed July 13, 2015, [http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national\\_transportation\\_statistics/html/table\\_01\\_2\\_3.html](http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/html/table_01_2_3.html).

<sup>64</sup> Thompson Bzdek and Ore, *The Mission 66 Program at Rocky Mountain National Park*, 21.

<sup>65</sup> Stephen Williams, “Decades of Best-Selling Cars,” *The New York Times*, August 6, 2009, accessed July 13, 2015, [http://wheels.blogs.nytimes.com/2009/08/06/decades-of-best-selling-cars/?\\_r=0](http://wheels.blogs.nytimes.com/2009/08/06/decades-of-best-selling-cars/?_r=0). The 1965 Chevrolet Impala still holds the American record for most single-year sales of any individual model.

<sup>66</sup> Hal Higdon, “After the Horsepower Race—Now a Silence Race,” *The New York Times*, May 1, 1966, accessed July 13, 2015,

<http://search.proquest.com.ezproxy2.library.colostate.edu:2048/hnpnewyorktimes/docview/117090753/286C9395F6C64191PQ/20?accountid=10223>.

<sup>67</sup> Karin Bijsterveld et al., *Sound and Safe: A History of Listening Behind the Wheel* (Oxford: Oxford University Press, 2014), 151.

<sup>68</sup> Schafer, *The Soundscape*, 83.

<sup>69</sup> “Restrict Helicopters,” *Estes Park Trail-Gazette*, July 12, 1982, in box labeled NR, S-16, Sound—Overflights Issue File, Rocky Mountain National Park Museum Storage Facility, Estes Park, CO. “Sound” from here on. This box was not organized into specific folders when I accessed materials in March 2015.

<sup>70</sup> Jesse R. Barber et al., “Conserving the Wildlife Therein: Protecting Park Fauna from Anthropogenic Noise,” *Park Science* 26, no. 3 (Winter, 2009-10): 26.

<sup>71</sup> Knudten, “A Diminishing Shadow,” 42, 55.

<sup>72</sup> “Estes Park, Colorado—Rocky Mountain National Park,” brochure, unmarked box, Estes Park Museum, Estes Park, CO. This brochure did not list a specific date, but it did repeat images and language contained in other materials from the mid-fifties.

<sup>73</sup> *Ibid.*

<sup>74</sup> *Ibid.*



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<sup>75</sup> During my hike along Ute Trail, I counted eight commercial jets flying only a couple thousand feet above me in the span of thirty minutes. This isn't counting aircraft flying at cruising altitudes, which can be heard but are not as conspicuous.

<sup>76</sup> "Historical Aircraft Statistics, Annual 1954-1980," United States Department of Transportation, accessed April 29, 2016,

[http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/subject\\_areas/airline\\_information/air\\_carrier\\_traffic\\_statistics/airtraffic/annual/1954\\_1980.html](http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/subject_areas/airline_information/air_carrier_traffic_statistics/airtraffic/annual/1954_1980.html).

<sup>77</sup> Historical flight path data is not readily available, but aircraft would likely have taken similar routes as they do today. I gathered flight path data via [www.flightradar24.com](http://www.flightradar24.com), a website which provides flight radar data to the public, which includes recent flight histories. I gathered data pertaining to Seattle-Denver flights by looking at Southwest Airlines' present day Seattle-Denver route. Accessed July 13, 2015, <http://www.flightradar24.com/data/flights/wn478/#6c1894a>.

<sup>78</sup> Continental Airlines' 1971 time tables, accessed July 13, 2015, <http://www.departedflights.com/CO103171p28.html>; <http://www.departedflights.com/CO103171p8.html>. Historic timetables and route maps are digitized at [www.departedflights.com](http://www.departedflights.com) and [www.airwaysnews.com](http://www.airwaysnews.com).

<sup>79</sup> James L. Hildebrand, "Noise Pollution: An Introduction to the Problem and an Outline for Future Legal Research." *Columbia Law Review* 70.4 (1970): 652.

<sup>80</sup> Garret Keizer, *The Unwanted Noise of Everything We Want: A Book About Noise* (New York: Public Affairs, 2010), 180.

<sup>81</sup> Franke, et al., "Natural Resource Vital Signs at Rocky Mountain National Park," 31.

<sup>82</sup> Michael Marden, Airport Committee, Estes Park Chamber of Commerce—letter to Secretary of Interior, Francis Seaton, March 20, 1958, Subseries 2.6: Lands and Recreation, File Units 219-226, Rocky Mountain National Park Museum Storage Facility, Estes Park, CO. Materials from this subseries hereafter cited as "LR."

<sup>83</sup> Woodrow Bussey, Pres. Bussey Hills Corp.—letter to James V. Lloyd, RMNP Superintendent, May 24, 1956, LR, Rocky Mountain National Park Museum Storage Facility, Estes Park, CO.

<sup>84</sup> Lucas V. Beau—letter to Conrad Wirth, director of the National Park Service, January 20, 1955, LR, Rocky Mountain National Park Museum Storage Facility, Estes Park, CO.

<sup>85</sup> J. R. Bissell Jr., president of Estes Park Airport Committee—text of paper presented to Governor Love's forum, Loveland, CO, January 10, 1964, LR, Rocky Mountain National Park Museum Storage Facility, Estes Park, CO.

<sup>86</sup> Ibid.

<sup>87</sup> "Minutes, Airport Committee," March 15, 1962, LR, Rocky Mountain National Park Museum Storage Facility, Estes Park, CO.

<sup>88</sup> Buchholtz, *Rocky Mountain National Park*, 214.

<sup>89</sup> Hal K. Rothman, "The End of Federal Hegemony: The Wilderness Act and Federal Land Management on the Pajarito Plateau, 1955-1980," *Environmental History Review* 16, no. 2 (Summer 1992), 41-44, accessed April 29, 2016, <http://www.jstor.org/stable/3984928>.

<sup>90</sup> Fraser F. Darling and Noel D. Eichhorn, *Man and Nature in the National Parks: Reflections on Policy*, 2nd ed. (Washington D. C.: The Conservation Foundation, 1969), 20.

<sup>91</sup> Darling and Eichhorn, *Man and Nature in the National Parks*, 11.

<sup>92</sup> Buchholtz, *Rocky Mountain National Park*, 221. Buchholtz writes that backcountry hiking increased 900% between 1965 and 1975.

<sup>93</sup> "2 Firms Planning Helicopter Service," *Estes Park Trail-Gazette*, May 12, 1982, in Sound, Rocky Mountain National Park Museum Storage Facility, Estes Park, CO.

<sup>94</sup> Ibid.

<sup>95</sup> "Town Board Vetoes Helicopters, 4-2," *Estes Park Trail-Gazette*, May 21, 1982, Sound, Rocky Mountain National Park Museum Storage Facility, Estes Park, CO.

<sup>96</sup> Ibid.

<sup>97</sup> Ibid.

<sup>98</sup> Louter, 105-09.

<sup>99</sup> Robert E. Manning and Laura E. Anderson, *Managing Outdoor Recreation: Case Studies in the National Parks* (Cambridge, MA: CABI, 2012), 132-34.

<sup>100</sup> Robert Righter, *Crucible for Conservation: The Creation of Grand Teton National Park* (Boulder: Colorado Associated University Press, 1982), 150.

<sup>101</sup> David Mooney, "Save Silence, Ground Choppers," *Estes Park Trail-Gazette*, June 25, 1982, Sound, Rocky Mountain National Park Museum Storage Facility, Estes Park, CO.

<sup>102</sup> Ibid.

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<sup>103</sup> See Abbey, *Desert Solitaire*; Peter A. Coates, “The Strange Stillness of the Past: Toward an Environmental History of Sound and Noise,” *Environmental History* 10, no. 4 (Oct. 2005): 650-51, accessed April 20, 2015, <http://www.jstor.org/stable/3986142>.

<sup>104</sup> Sutter, *Driven Wild*, 14.

<sup>105</sup> “Rocky Mountain National Park: The Rooftop of the Continent,” published by United States Department of the Interior, National Park Service, Rocky Mountain National Park, September 1995, in Sound, Rocky Mountain

National Park Museum Storage Facility, Estes Park, CO.

<sup>106</sup> Louter, 4; also see Peter J. Schmitt, *Back to Nature: The Arcadian Myth in Urban America* (New York: Oxford University Press, 1969).

<sup>107</sup> “Estes Park, Colorado – FREE MAP – Rocky Mountain National Park, The Switzerland of America!” 1982, unmarked box, Estes Park Museum, Estes Park, CO; “Town Map, Estes Park, Colorado,” 1982, unmarked box, Estes Park Museum, Estes Park, CO.

<sup>108</sup> Louter, 10.

<sup>109</sup> For automobile noise, see Logan Park, et al. (footnote #6), my own experiences on Ute Trail, as well as this letter-to-the-editor in the *Estes Park Trail-Gazette*, July 2, 1982: “...restrict helicopters to the business section of downtown Estes Park, and the airspace above its tourist highways, because you couldn’t hear the helicopters above the loud motorcycles and ‘muscle cars’ that are not permitted in more fragile environments such as Boulder,” Sound, Rocky Mountain National Park Museum Storage Facility, Estes Park, CO; “highway to the sky” quote is from the NPS’s “Trail Ridge Road” webpage, accessed April 20, 2015, [http://www.nps.gov/romo/planyourvisit/trail\\_ridge\\_road.htm](http://www.nps.gov/romo/planyourvisit/trail_ridge_road.htm).

<sup>110</sup> Knudten, “A Diminishing Shadow,” 38.

<sup>111</sup> Estes Park League of Women Voters – letter to FAA, April 5, 1995, materials sent by Estes Park League of Women Voters to author, materials in possession of author.

<sup>112</sup> “Commercial Tour Overflights,” Prepared for: Secretary of the Interior Bruce Babbitt, May 24, 1995, materials sent by Estes Park League of Women Voters to author, materials in possession of author.

<sup>113</sup> “Rocky Mountain National Park: The Rooftop of the Continent,” 12.

<sup>114</sup> “Chamber Joins Lobbying Effort to Keep Helicopters out of EP,” *Estes Park Trail-Gazette*, April 26, 1995.

<sup>115</sup> “Rocky Mountain National Park: The Rooftop of the Continent,” 2.

<sup>116</sup> Kevin R. Marsh, *Drawing Lines in the Forest: Creating Wilderness Areas in the Pacific Northwest* (Seattle: University of Washington Press, 2007), 6. Marsh notes how postwar debates over the creation of wilderness areas in national forests revolved around the practical consequences regarding land use that wilderness areas affected.

<sup>117</sup> Diana Dalbotten, Gillian Roehrig, and Patrick Hamilton, *Future Earth: Advancing Civic Understanding of the Anthropocene* (Washington D. C.: American Geophysical Union, 2014), 1.

<sup>118</sup> “March 7, 2016 Average Historical Annual Gasoline Pump Price, 1929-2015,” U. S. Department of Energy, accessed April 15, 2015, <http://energy.gov/eere/vehicles/fact-835-august-25-average-historical-annual-gasoline-pump-price-1929-2013>.

<sup>119</sup> “Too much of a good thing: Alpine plants under threat in Rocky Mountain National Park,” Institute of Arctic and Alpine Research, University of Colorado-Boulder, July 6, 2012, accessed April 29, 2016, <http://instaar.colorado.edu/news-events/instaar-news/too-much-of-a-good-thing-alpine-plants-under-threat-in-rocky-mountain-natio/>.

<sup>120</sup> “Estes Park, Colorado – FREE MAP – Rocky Mountain National Park: The Switzerland of America!” 1982, unmarked box, Estes Park Museum, Estes Park, CO.

<sup>121</sup> Emily Thompson, *The Soundscape of Modernity: Architectural Acoustics and the Culture of Listening in America, 1900-1933*, (Cambridge, MA: MIT Press, 2004), 4.

<sup>122</sup> Wells, *Car Country*, 219. Wells notes that closed-car designs transformed “weather” into “scenery” for drivers. In-car, oral interpretations of the park, especially with the inclusion of sound effects, would have only pushed this change a step further.

<sup>123</sup> Jenifer Van Vleck, *Empire of the Air: Aviation and the American Ascendancy* (Cambridge, MA: Harvard University Press, 2013), 3, 5-6, 9.

<sup>124</sup> Smil, *Two Prime Movers of Globalization*, 158-59, 199, 206-07.

<sup>125</sup> Smil, *Two Prime Movers of Globalization*, 210.

<sup>126</sup> Roger E. Bilstein, *The American Aerospace Industry: From Workshop to Global Enterprise* (New York: Twayne, 1996), 147.

<sup>127</sup> Stuart I. Rochester, *Takeoff at Mid-Century: Federal Civil Aviation Policy in the Eisenhower Years, 1953-1961* (Washington D.C.: U.S. Department of Transportation, 1976), 59-64; Richard J. Kent, Jr., *Safe, Separated, and*

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<sup>128</sup> Keizer, *The Unwanted Noise of Everything We Want*, 184.

<sup>129</sup> "Special Flight Rules in the Vicinity of Rocky Mountain National Park," *Federal Register*, Department of Transportation, May 15, 1996, Sound, Rocky Mountain National Park Museum Storage Facility, Estes Park, CO.

<sup>130</sup> "Natural Sounds," National Park Service website, accessed April 29, 2016,

<http://www.nature.nps.gov/sound/index.cfm>.

<sup>131</sup> Ibid.

<sup>132</sup> "Sounds We Protect," National Park Service website, accessed April 29, 2016,

<http://www.nature.nps.gov/sound/protect.cfm>.

<sup>133</sup> Frank, *Making Rocky Mountain National Park*, 125-40; Karl Hess, *Rocky Times in Rocky Mountain National Park: An Unnatural History*, (Niwt: University Press of Colorado, 1993), 22-24, 27.

<sup>134</sup> Keizer, *The Unwanted Noise of Everything We Want*, 15.

<sup>135</sup> Megan Lepisto, "Look beyond 'environment' in gauging public opinion, says Nelson Institute director," Nelson Institute for Environmental Studies, March 27, 2015, accessed April 29, 2016,

<http://nelson.wisc.edu/news/story.php?story=2149>.

<sup>136</sup> For a look at such laws in Europe see Karin Bijsterveld, *Mechanical Sound: Technology, Culture, and the Public Problems of Noise in the Twentieth Century* (Cambridge, MA: MIT Press, 2008).

<sup>137</sup> Buchholtz, *Rocky Mountain National Park*, 199.

<sup>138</sup> Kathryn Howes Barth and Ann Alexander Leggett, *Finding Hidden Valley: A Recollective History of a Colorado Ski Area* (Boulder: White Sands Lake Press, 2006), 41-42.

<sup>139</sup> Barth and Leggett, *Finding Hidden Valley*, 46-47.

<sup>140</sup> John Fry, *The Story of Modern Skiing* (Lebanon, NH: University Press of New England), 25.

<sup>141</sup> Andrew C. Isenberg, *The Destruction of the Bison: An Environmental History, 1750-1920* (Cambridge, UK: Cambridge University Press, 2000), 121-22, 130-31; Andrews, *Killing for Coal*, 78-83.

<sup>142</sup> See Johnson, *Carbon Nation*.

<sup>143</sup> Andrew Denning, *Skiing into Modernity: A Cultural and Environmental History* (Oakland: University of California Press, 2015), 3; Daniel Scott and Geoff McBoyle, "Climate Change Adaptation in the Ski Industry," *Mitigation and Adaptation Strategies for Global Change* 12, no. 8 (December, 2006): 1411-31, accessed November 23, 2015, doi: 10.1007/s11027-006-9071-4.; Jon Moen and Peter Fredman, "Effects of Climate Change on Alpine Skiing in Sweden," *Journal of Sustainable Tourism* 15, no. 4 (2007): 418-37, accessed November 23, 2015, doi: 10.2167/jost624.0.; Daniel Scott, Geoff McBoyle, Alanna Minogue, and Bria Agen Mills, "Climate Change and the Sustainability of Ski-based Tourism in Eastern North America: A Reassessment," *Journal of Sustainable Tourism* 14, no. 4 (2006): 376-98, accessed November 23, 2015, doi: 10.2167/jost550.0.

<sup>144</sup> Clive Hamilton, Françoise Gemenne, and Christophe Bonneuil, eds., *The Anthropocene and the Global Environmental Crisis: Rethinking Modernity in a New Epoch* (London: Routledge, 2015), 4.

<sup>145</sup> Gregory Simon and Peter Alagona, "Beyond Leave No Trace," *Ethics, Place, and Environment* 12, no. 1 (March, 2009): 29.

<sup>146</sup> Rachel Gross, "Synthetic Wilderness: Gore-Tex and the Paths to Mastery in Outdoor Recreation" (MA thesis, University of Wisconsin, 2012).

<sup>147</sup> Bill Tanler, ed., *Ski Tech's Guide to Equipment, Skiwear, and Accessories* (Santa Fe: John Muir Publications, 1989), 49.

<sup>148</sup> Ted Bays, *Nine Thousand Years of Skis: Norwegian Wood to French Plastic* (Ishpeming, MI: National Ski Hall of Fame Press, 1980), 86.

<sup>149</sup> Jeffrey L. Meikle, "Material Doubts: The Consequences of Plastic," *Environmental History* 2, no. 3 (July 1997): 281.

<sup>150</sup> Patricia L. Corcoran, Charles J. Moore, and Kelly Jazvac, "An Anthropogenic Marker Horizon in the Future Rock Record," *GSA Today* 24, no. 6 (June 2014): 4-8, accessed November 22, 2015, DOI: 10.1130/GSAT-G198A.1.

<sup>151</sup> Thomas R. Cox, "The North American-Japan Timber Trade: The Roots of Canadian and U.S. Approaches," *Forest and Conservation History* 34, no. 3 (July, 1990): 113, accessed December 17, 2015, <http://www.jstor.org/stable/3983900>.

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- <sup>155</sup> Ndiaye, *Nylon and Bombs*, 2.
- <sup>156</sup> Fry, *The Story of Modern Skiing*, 25; Chris Landers, *Learn to Ski* (Chicago: Rand McNally, 1969), 18.
- <sup>157</sup> Gross, "Synthetic Wilderness."
- <sup>158</sup> Graham D. Taylor and Patricia E. Sudnik, *Du Pont and the International Chemical Industry* (Boston: G.K. Hall and Company, 1984), 155.
- <sup>159</sup> Hamilton, Gemenne, and Bonneuil, *The Anthropocene and the Global Environmental Crisis*, 1.
- <sup>160</sup> Tanler, *Ski Tech's Guide to Equipment, Skiwear, and Accessories*, 52-53.
- <sup>161</sup> "The Historic Old Hickory Village," accessed December 17, 2015, <http://www.oldhickory.org/aboutvillage.html>.
- <sup>162</sup> *Skiing*, September 1973, pg. 1, accessed January 12, 2016, [https://books.google.com/books?id=ZWSt2p6yefcC&pg=PA134&lpg=PA134&dq=teflon+skiing&source=bl&ots=j1D78MX3X&sig=oAYypovRbdsem1Ek633WDGMkgeo&hl=en&sa=X&ved=0ahUKEwiE1sak7KXXAhVJ\\_WMKHabXA-QQ6AEIVDAK#v=onepage&q=teflon%20&f=false](https://books.google.com/books?id=ZWSt2p6yefcC&pg=PA134&lpg=PA134&dq=teflon+skiing&source=bl&ots=j1D78MX3X&sig=oAYypovRbdsem1Ek633WDGMkgeo&hl=en&sa=X&ved=0ahUKEwiE1sak7KXXAhVJ_WMKHabXA-QQ6AEIVDAK#v=onepage&q=teflon%20&f=false).
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- <sup>171</sup> Nancy Langston, *Toxic Bodies: Hormone Disruptors and the Legacy of DES* (New Haven, CT: Yale University Press, 2010), 17.
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- <sup>176</sup> Fry, *The Story of Modern Skiing*, 44.
- <sup>177</sup> Michael W. Childers, *Colorado Powder Keg: Colorado Ski Resorts and the Environmental Movement* (Lawrence: University Press of Kansas, 2012), 37.
- <sup>178</sup> Smil, *Two Prime Movers*, 2.
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- <sup>191</sup> Fry, *The Story of Modern Skiing*, 58.
- <sup>192</sup> Wilkinson, *Fire on the Plateau*, xii-xiii, 178-85.
- <sup>193</sup> Alan Prendergast, "The Mid-Life Crisis of the Colorado Ski Industry," *Empire Magazine*, April 8, 1984, in "Newspaper Clippings, 1972-93," Folder 8, Series VII, Box 5, Hidden Valley Records, Rocky Mountain National Park Museum Storage Facility, Estes Park, CO.
- <sup>194</sup> Childers, *Colorado Powder Keg*, 71.
- <sup>195</sup> Kay Collins letter to Roger Contor, August 7, 1972, "Correspondence and Memos, 1971-73," Folder 2, Box 1, Hidden Valley Records, Rocky Mountain National Park Museum Storage Facility, Estes Park, CO.
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- <sup>197</sup> Harvey, "Loving the Wild in Postwar America," in *American Wilderness*, 187-91.
- <sup>198</sup> Harvey, "Loving the Wild in Postwar America," in *American Wilderness*, 189-90; Sellars, *Preserving Nature in the National Parks*, 182.
- <sup>199</sup> James Morton Turner, "From Woodcraft to 'Leave No Trace': Wilderness, Consumerism, and Environmentalism in Twentieth-Century America," *Environmental History* 7, no. 3 (July, 2002): 463, accessed November 26, 2015, <http://www.jstor.org/stable/3985918>.
- <sup>200</sup> Sellars, *Preserving Nature in the National Parks*, 233-39.
- <sup>201</sup> Simon and Alagona, "Beyond Leave No Trace," 23.
- <sup>202</sup> Tanler, *Ski Tech's Guide to Equipment, Ski Wear, and Accessories*, 52-54.
- <sup>203</sup> Ndiaye, *Nylon and Bombs*, 200.
- <sup>204</sup> The Footprint Chronicles, Patagonia website, accessed April 29, 2016, <http://www.patagonia.com/us/footprint>.
- <sup>205</sup> Simon and Alagona, "Beyond Leave No Trace," 24.
- <sup>206</sup> Jenny Price, "Looking for Nature at the Mall: A Field Guide to the Nature Company," in *Uncommon Ground*, 190.
- <sup>207</sup> "Backcountry Use," 1977, unmarked folder and box, Rocky Mountain National Park Museum Storage Facility, Estes Park, CO.
- <sup>208</sup> Simon and Alagona, "Beyond Leave No Trace," 29.
- <sup>209</sup> See Chakrabarty, "The Climate of History."
- <sup>210</sup> Sellars, *Preserving Nature in the National Parks*, 156-64.
- <sup>211</sup> Sellars, *Preserving Nature in the National Parks*, 193.
- <sup>212</sup> William Cronon, "The Trouble with Wilderness; or, Getting Back to the Wrong Nature," *Uncommon Ground*, 75-78.
- <sup>213</sup> See Sutter, *Driven Wild*.
- <sup>214</sup> See Richard White, "'Are You an Environmentalist, or do You Work for a Living?': Work and Nature," *Uncommon Ground*, 171-85.
- <sup>215</sup> "COOP Elk Study—Tagging and Banding 1954-1973," folder 4, Series 003.01, Box 1, Elk and Deer Records, Rocky Mountain National Park Museum Storage Facility, Estes Park, CO. "Elk and Deer" from this point forward.
- <sup>216</sup> Sellars, *Preserving Nature in the National Parks*, 119.
- <sup>217</sup> Frank, *Making Rocky Mountain National Park*, 115, 121-23.
- <sup>218</sup> R. Gerald Wright, *Wildlife Research and Management in the National Parks* (Urbana: University of Illinois Press, 1992), 73-77.
- <sup>219</sup> "Long Range Management Plan for the Eastern Rocky Mountain Elk and Deer," folder 5, Box 1, Series 003.01, Elk and Deer.
- <sup>220</sup> Steve Statham, *Jeep: Color History* (Osceola, WI: MBI Publishing, 1999), 19; Paul Ingrassia, *Engines of Change: A History of the American Dream in Fifteen Cars* (New York: Simon and Schuster, 2012), 268.
- <sup>221</sup> For "high-modernism," see Scott, *Seeing Like a State*.
- <sup>222</sup> Rocky Mountain Cooperative Elk Studies Preliminary Report, 1962-63, in "1962-1974: Rocky Mountain Council for Cooperative Wildlife Management," folder 15, Series 003.01, Box 2, Elk and Deer.

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- <sup>223</sup> Etienne Benson, *Wired Wilderness: Technologies of Tracking and the Making of Modern Wildlife* (Baltimore: Johns Hopkins University Press, 2010), 2, 6, 10, 13-14.
- <sup>224</sup> See Lincoln Bramwell, *Wilderburbs: Communities on Nature's Edge* (Seattle: University of Washington Press, 2014).
- <sup>225</sup> Donald Worster, *Nature's Economy: The Roots of Ecology* (San Francisco: Sierra Club Books, 1977), 292-94, 302-03; Eugene P. Odom, *Fundamentals of Ecology* (Philadelphia: W.B. Saunders Company, 1953).
- <sup>226</sup> Jeep is indeed a name brand, but the term "jeep" also refers to non-Jeep variants of multi-seat, large off-road vehicles. Thus, I will use the lower-case term "jeep" in this chapter, to describe the vehicle type in its breadth.
- <sup>227</sup> Jeep, 2012 Wrangler Sahara advert, accessed February 16, 2016, <https://foltztech.files.wordpress.com/2013/03/jeep.jpg>.
- <sup>228</sup> Jeep, 2012 Wrangler Call of Duty: MW3 edition adverts, accessed February 16, 2016, <http://forum.exotics4life.com/attachment.php?attachmentid=3832&d=1321286080> and <http://www.thedetroitbureau.com/wp-content/uploads/2011/11/Jeep-Wrangler-Call-of-Duty-ad.jpg>.
- <sup>229</sup> Jeep, Wrangler advert, c. 1990, accessed February 16, 2016, <https://s-media-cache-ak0.pinimg.com/236x/92/16/03/92160371d9c9025a77896dc2bf87c94f.jpg>.
- <sup>230</sup> See chapter on jeeps in Ingrassia, *Engines of Change*.
- <sup>231</sup> Statham, *Jeep: Color History*, 19-22.
- <sup>232</sup> Ingrassia, *Engines of Change*, 268.
- <sup>233</sup> Cited in Statham, *Jeep: Color History*, 42.
- <sup>234</sup> Raye C. Ringholz, *Uranium Frenzy: Saga of the Nuclear West* (Logan: University of Utah Press, 2002), 49-50, 55.
- <sup>235</sup> Patrick R. Foster, *The Story of Jeep*, 2<sup>nd</sup> ed. (Iola, WI: Krause Publications, 2004), 20.
- <sup>236</sup> Foster, *The Story of Jeep*, 8-20.
- <sup>237</sup> "Reduction Program, 1955-56, R.M.N.P." folder 6, Series 003.01, Box 1, Elk and Deer.
- <sup>238</sup> "Wildlife Management, Rocky Mountain National Park, 1958-59," folder 6, Series 003.01, Box 1, Elk and Deer; "Wildlife Management Report for 1960-1961," folder 6, Series 003.01, Box 1, Elk and Deer.
- <sup>239</sup> "Wildlife Management Report for 1960-1961," folder 6, Series 003.01, Box 1, Elk and Deer.
- <sup>240</sup> "Reduction Program, 1955-56, R.M.N.P."; Horseback reconnaissance folder 2, Series 003.01, Box 1, Elk and Deer; Neal Guse, Jr., Park Biologist, "Natural Sciences Research Plan, Rocky Mountain National Park, 1965," in Elk Research Plans 1965-1988, folder 20, Series 003.04, Box 2, Elk and Deer.
- <sup>241</sup> A. Lynn Coffin and J. Barton Herschler, "Elk-Deer Management in Rocky Mountain National Park," 1950, folder 2, Series 003.01, Box 1, Elk and Deer; Neal G. Guse, Jr., Biologist, RMNP, "Effective Management Program Requirement for Eastern Rocky Mountain Deer and Elk Herds," folder 14, Series 003.01, Box 2, Elk and Deer.
- <sup>242</sup> A. Lynn Coffin and J. Barton Herschler, "Elk-Deer Management in Rocky Mountain National Park;" Wright, *Wildlife Research and Management in the National Parks*, 77.
- <sup>243</sup> David D. Condon, Associate Park Naturalist, "Recommendation and an Outline for the Management of the Elk and Deer Population in Rocky Mountain National Park," 1943, folder 1, Series 003.01, Box 1, Elk and Deer.
- <sup>244</sup> "Reduction Program 1955-56, R.M.N.P." Elk and Deer.
- <sup>245</sup> Frank, *Making Rocky Mountain National Park*, 124.
- <sup>246</sup> See Sellars, *Preserving Nature in the National Parks*; Wright, *Wildlife Research and Management in the National Parks*.
- <sup>247</sup> Alice Wondrak Biel, *Do (Not) Feed the Bears: The Fitful History of Wildlife and Tourists in Yellowstone* (Lawrence: University Press of Kansas, 2006), 1.
- <sup>248</sup> Census of Population and Housing, census.gov.
- <sup>249</sup> Bramwell, *Wilderburbs*, 20-21.
- <sup>250</sup> A. Lynn Coffin and J. Barton Herschler, "Elk-Deer Management in Rocky Mountain National Park," 1950, folder 2, Series 003.01, Box 1, Elk and Deer.
- <sup>251</sup> Coffin and Herschler, "Elk-Deer Management in Rocky Mountain National Park," 1950.
- <sup>252</sup> Daniel Tyler, *The Last Water Hole in the West: The Colorado-Big Thompson Project and the Northern Colorado Water Conservancy District* (Niwot: University Press of Colorado, 1992), 119-20; for militarization of the national state during World War II, see Sparrow, *Warfare State*.
- <sup>253</sup> Thomas G. Andrews, *Coyote Valley: Deep History in the High Rockies* (Cambridge, MA: Harvard University Press, 2015), 233.
- <sup>254</sup> "Elk Trapping and Transplanting Program, Rocky Mountain National Park, Winter, 1967-68," folder 22, Series 003.01, Box 3, "Elk Population Management, 1967-1991," Deer and Elk; folder 4, Series 003.01, Box 1, Deer and Elk.

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- <sup>256</sup> Benson, *Wired Wilderness*, 2.
- <sup>257</sup> Jay P. Spenser, *Whirlybirds: A History of the U.S. Helicopter Pioneers* (Seattle: University of Washington Press, 1998), 36, 42.
- <sup>258</sup> Spenser, *Whirlybirds*, 192, 210.
- <sup>259</sup> Rochester, *Takeoff at Mid-Century*, 4.
- <sup>260</sup> Spenser, *Whirlybirds*, 215, 219-21.
- <sup>261</sup> See Deborah Fitzgerald, *Every Farm a Factory: The Industrial Ideal in American Agriculture* (New Haven: Yale University Press, 2003), 106-28.
- <sup>262</sup> Spenser, *Whirlybirds*, 225, 247; Bell Helicopter website, "Company History," accessed February 25, 2016, <http://www.bellhelicopter.com/company/history/1960-1969>; Ringholz, *Uranium Frenzy*, 74.
- <sup>263</sup> Frank, *Making Rocky Mountain National Park*, 130-33.
- <sup>264</sup> Frank, *Making Rocky Mountain National Park*, 134-36.
- <sup>265</sup> "COOP Elk Study—Tagging and Banding 1954-1973," 1966 folder 4, Series 003.01, Box 1, Elk and Deer.
- <sup>266</sup> "Rocky Mountain Cooperative Elk Studies Preliminary Report, 1962-63," folder 15, Series 003.01, Box 2, Elk and Deer.
- <sup>267</sup> "Elk Population Management 1967-1991," 1968, folder 22, Series 003.03, Box 3, Elk and Deer.
- <sup>268</sup> "Richard N. Denney, Dept. of Game, Fish and Parks to Robert Lewis, Routt National Forest, February 21," 1965, in "COOP Elk Study—Census and Band Returns 1963-1972," folder 19, Series 003.04, Box 1, Elk and Deer.
- <sup>269</sup> "COOP Elk Study—Tagging and Banding 1954-1973," folder 4, Series 003.01, Box 1, Elk and Deer.
- <sup>270</sup> Edmund J. Bucknall, Park Ranger, Wildlife Management, RMNP to Regional Biologist, Midwest Region, "Attempt to Haze Elk by Helicopter—September Pre-Season, 1967," in COOP Elk Study—Census and Band Returns 1963-1972, folder 19, Series 003.04, Box 2, Elk and Deer.
- <sup>271</sup> *Ibid.*
- <sup>272</sup> *Ibid.*
- <sup>273</sup> Frank, *Making Rocky Mountain National Park*, 133.
- <sup>274</sup> See Karl Jacoby, *Crimes Against Nature: Squatters, Poachers, Thieves, and the Hidden History of American Conservation* (Berkeley: University of California Press, 2001) and Louis S. Warren, *The Hunter's Game: Poachers and Conservationists in Twentieth-Century America* (New Haven, CT: Yale University Press, 1997).
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- <sup>277</sup> Wright, *Wildlife Research and Management in the National Parks*, 77-78.
- <sup>278</sup> Folder 16, Series 003.01, Box 2, Elk and Deer.
- <sup>279</sup> Benson, *Wired Wilderness*, 2.
- <sup>280</sup> "Bear—Seasonal Distribution and Population Characteristics of Elk in Estes Park Colorado—April 1989," folder 4, Series 03.004, Box 1, Elk and Deer; Benson, *Wired Wilderness*, 25, 29.
- <sup>281</sup> Schmitt, *Back to Nature*, xvii-xviii.
- <sup>282</sup> Benson, *Wired Wilderness*, 10.
- <sup>283</sup> Regarding the political origins of the post-WWII crusader state, see Ira Katznelson, *Fear Itself: The New Deal and the Origins of Our Time* (New York: Liveright, 2013).
- <sup>284</sup> Neal Guse, Jr., Park Biologist, "Natural Sciences Research Plan, Rocky Mountain National Park," Box 2, Series 003.04, folder 20, Elk and Deer.
- <sup>285</sup> Benson, *Wired Wilderness*, 64-68, 70, 79-86.
- <sup>286</sup> The literature on this ecological turn is quite large. For environmental historians, the best resource is probably Worster, *Nature's Economy*, 261.
- <sup>287</sup> Frank Benjamin Golley, *A History of the Ecosystem Concept in Ecology: More than the Sum of the Parts* (New Haven, CT: Yale University Press, 1993), 2.
- <sup>288</sup> Golley, *A History of the Ecosystem Concept in Ecology*, 2-3.
- <sup>289</sup> "Bear—Seasonal Distribution and Population Characteristics of Elk in Estes Park Colorado—April 1989," folder 4, Series 03.004, Box 1, Elk and Deer; Ronald A. Green and George D. Bear, "Seasonal Cycles and Daily Activity Patterns of Rocky Mountain Elk," *The Journal of Wildlife Management* 54, no. 2, (April, 1990): 272-79.

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- <sup>291</sup> Lewis, *Inventing Global Ecology*, 14-17, 18-19, 178-79; Ramachandra Guha, *The Unquiet Woods: Ecological Change and Peasant Resistance in the Himalaya* (Berkeley: University of California Press, 1990).
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- <sup>293</sup> See Paul N. Edwards, *A Vast Machine: Computer Models, Climate Data, and the Politics of Global Warming* (Cambridge, MA: MIT Press, 2010).
- <sup>294</sup> RMNP Costa Rica Report, 2015, materials sent directly from Rocky Mountain National Park Museum Storage Facility to author, materials in author's possession; for history of Costa Rica's national parks, see Sterling Evans, *The Green Republic: A Conservation History of Costa Rica* (Austin: University of Texas, 1999).
- <sup>295</sup> Bear, "Seasonal Cycles and Daily Activity Patterns of Rocky Mountain Elk," 276.
- <sup>296</sup> Curt Meine, "A Letter to the Editors: In Defense of the Relative Wild," in *After Preservation: Saving American Nature in the Age of Humans*, ed. Ben Minteer and Stephen Pyne (Chicago: University of Chicago Press, 2015), 91.
- <sup>297</sup> Such mosaics of land use practices—varying across time and space—have been coined "novel ecosystems" by geographer and environmental scientist Erle Ellis. See Erle Ellis, "Conserving a Used Planet: Embracing Our History as Transformers of Earth," *Snapp*, September 24, 2013, accessed April 23, 2016, <http://snappartnership.net/magazine/embracing-our-history-as-transformers-of-earth/>.
- <sup>298</sup> Jodi A. Hilty, William Z. Lidicker Jr., and Adina M. Merenlender, *Corridor Ecology: The Science and Practice of Linking Landscapes for Biodiversity Conservation* (Washington: Island Press, 2006), 22-23. Hilty, Lidicker Jr., and Merenlender note how national parks are often facetiously referred to as "rock and ice" for their barren nature. Indeed, RMNP was only protected after public surveys proved its relative lack of mining resources.
- <sup>299</sup> For ideas concerning this, see Jamie Lorimer, *Wildlife in the Anthropocene* (Minneapolis: University of Minnesota Press, 2015).
- <sup>300</sup> Aldo Leopold, *A Sand County Almanac: With Essays on Conservation from Round River* (Oxford, UK: Oxford University Press, 1966), 240.
- <sup>301</sup> Leopold, *A Sand County Almanac*, 200-02.
- <sup>302</sup> See Hilty, Lidicker Jr., and Merenlender, *Corridor Ecology*.
- <sup>303</sup> Meine, "A Letter to the Editors," *After Preservation*, 92.
- <sup>304</sup> Clive Hamilton, *Earthmasters: The Dawn of the Age of Climate Engineering* (New Haven, CT: Yale University Press, 2013), 1-3.
- <sup>305</sup> Hamilton, *Earthmasters*, 107.
- <sup>306</sup> "An Ecomodernist Manifesto," accessed March 15, 2016, <http://www.ecomodernism.org/manifesto-english/>.
- <sup>307</sup> "An Ecomodernist Manifesto."
- <sup>308</sup> "An Ecomodernist Manifesto."
- <sup>309</sup> For the moral utility of extinction, see Minteer, "When Extinction is a Virtue," in *After Preservation*, 96-104.
- <sup>310</sup> "An Ecomodernist Manifesto."
- <sup>311</sup> Barth and Leggett, *Finding Hidden Valley*, 194-95.



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