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Skiing in the Time of Climate Change:

How US Ski Areas Can Become Environmental Educators and Climate Activists

by

Jessica Hoover

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Contents

Introduction

The inspiration for this paper came long before I was a graduate student. On a quintessential bluebird day in Colorado at least a decade ago, I was sitting on the outdoor patio of a ski area's mid-mountain restaurant, watching as people dumped their lunch trays. There were two containers, side by side: one for recycling, the other trash. I observed countless skiers and riders toss the remnants of their lunches into the trash can – even the recyclable beverage bottles. How is it possible that these people are not recycling?, I thought. They are skiers; they must like nature; and the recycling container is within easy reach. Thus, the seed for this research was planted.

A few years after that incident, I graduated from college and moved to Breckenridge, Colorado (or, more familiarly, Breck), where I had been hired as a children's ski instructor. I spent that season instructing, but left in the spring to join the Peace Corps. After spending two years in Turkmenistan, I returned to Breckenridge where I taught for another season. During my two seasons at Breckenridge, I paid close attention to the resort's environmental initiatives and wondered how they could be improved. Once I entered graduate school, I knew this would be the focus for my final research project. In 2012, when I was brainstorming which precise aspect of ski resort sustainability I wanted to study, I did not expect climate change to become a dominant theme. In retrospect this seems naïve. Climate change is the biggest threat the global ski industry has ever faced – yes, even bigger than the advent of environmental regulations during the 1970s. Any discussion of ski resort sustainability that does not address climate change is not a

discussion of sustainability. What is sustainability? More than merely long-term survival, it is long-term *thrival*.[1]

What began as an excuse to learn everything I could about resort-level environmental initiatives has evolved into a treatise on the importance of environmental education and climate activism. Two themes central to this research are sense of place and the adoption of ecotourism-like environmental education programs. Human bonds with geographical places can be powerful motivators for pro-environmental behavior and place protection. Moreover, environmental education programs in tourism settings have also been shown to influence visitors' environmental attitudes and behaviors, which are important antecedents to climate change belief and action. Incorporating outreach programs grounded in these concepts is a bold way in which US ski resorts could empower a constituency of climate-concerned skiers and riders.

To satisfy my own curiosity as a skier, and because I felt that to understand the modern ski industry, I needed to become familiar with the history of the sport, I decided to start at the very beginning. Chapter One outlines the beginnings of skiing, both in Europe and in the United States. It also documents the emergence of the US ski industry. Chapter Two details the environmental impacts of ski resort development and presents a few notable nature vs. ski industry controversies that have surfaced over the past several decades. In addition, it explains the relationship between the US Forest Service and the ski industry, as well as the impact environmental regulations have had on resort development. Chapter Three traces the rise in environmental programming at US ski resorts and within the ski resort trade group, the National Ski Areas Association. This chapter also introduces climate change and discusses the future of skiing in the US in relation to projected climate models. It ends with a call for ski areas to

[1] I borrowed this term from author Richard Louv.

become climate activists. Chapter Four is a review of academic literature on sense of place theory and environmental education in ecotourism contexts. Each of these concepts is applicable to ski resort settings and could be utilized to influence environmental behavior change. In Chapter Five, I present the results of my own field-work, conducted in Breckenridge, Colorado. I traveled there with the intent to learn more about environmental outreach at ski resorts, and I also surveyed skiers and riders in order to gauge the depth of their environmental motivations. An analysis of this research is offered in Chapter Six. There, I make the argument that because the ski industry is climate dependent, it has a role to play in encouraging skiers and riders to take personal and political action. Using sense of place and environmental interpretation, ski resorts can help people connect the dots between a nebulous, far-away concept and the impacts in their own lives. Because my survey results indicate that skiers are concerned about climate change, I assert that many people would be willing to follow a resort's lead. Finally, Chapter Seven concludes the paper.

Three important items to note for the reader: This paper is written from a white, middle-class, cultural perspective; however, this is appropriate as it is the cultural frame in which the ski industry is situated. Certainly one could argue that outdoor recreation in general is in need of greater racial diversity, but these contentions are beyond the purview of this paper. Second, I did not choose to conduct my field research at Breckenridge because of Vail Resorts' history of environmental controversies. I chose Breck because I have a great affection for the town and the ski area. Lastly, with apologies to snowboarders, any instances that only reference skiers, with the exception of Chapter One's historical narrative, should be understood as including both skiers and riders.

Fieldwork Methodology

I returned to Breckenridge for a week in March 2013 to learn more about the resort's environmental initiatives, particularly with respect to environmental outreach and education. I conducted semi-structured interviews with five key informants who were initially contacted via email. Participants included the environmental managers from both Breckenridge Ski Resort and Arapahoe Basin, a Breckenridge town planner, a US Forest Service officer, and a former Breckenridge town councilman. The content of these discussions will be included in Chapters Five and Six. In addition, to further enhance my understanding of the resort's environmental programming, I relied on the text of company webpages.

In order to gain insight on skiers' environmental opinions, I created a survey designed to measure environmental consciousness. Participant recruitment for the surveys was limited to public locations throughout the town of Breckenridge. Forty-six participants were surveyed by convenience sampling methods. The survey contains forty-two questions covering demographics, outdoor recreation participation, relationship to Breckenridge, environmental behaviors, opinion on climate change, awareness of Breck's environmental programming, and willingness to support increased environmental initiatives at the resort.

The survey also includes the fifteen questions that make up the revised New Ecological Paradigm (NEP) Scale, developed by Riley Dunlap and Kent Van Liere in 1978 and subsequently updated in 2000. Since its debut, the original, twelve-question NEP Scale has had widespread international use as a measure of ecological worldviews.[2] In their paper discussing the updated version of the NEP Scale, Dunlap and his co-authors reflect that "beliefs about

[2] Riley E. Dunlap et al., "Measuring Endorsement of the New Ecological Paradigm: A Revised NEP Scale," *Journal of Social Issues* 56, no. 3 (2000): 428.

nature and human's role in it as measured by the NEP items appear to constitute a fundamental component of people's belief systems vis-à-vis the environment."[3] Dunlap et al. further note that the "bulk of available evidence converges to suggest the overall validity of the NEP Scale."[4] Although the NEP Scale is based upon three main themes – balance of nature, limits to growth, and human domination of nature – both versions were designed as unidimensional measures of ecological worldview. Acknowledging that a number of researchers have chosen to analyze NEP Scores by individually measuring two or three of the component themes, Dunlap et al. leave that decision up to the researcher.

For the purposes of the present study, NEP scores are considered a unidimensional measure of ecological worldviews. Accordingly, responses to the individual questions were summed, resulting in the final NEP score. Measured on a five-point Likert Scale with answer choices ranging from "Strongly Disagree" to "Strongly Agree," the minimum number of points possible is fifteen, and the maximum is seventy-five. Higher scores are indicative of greater endorsement of pro-environmental worldviews. Generally, a score of forty-five marks the dividing line between an individual with a pro-environmental outlook and one with ecological ambivalence.[5] All survey data was entered into a Microsoft Excel spreadsheet and analyzed using basic statistical operations.

[3] Dunlap et al., "Measuring Endorsement," 428.
[4] Ibid., 430.
[5] Bruce E. Rideout, et al., "Endorsement of the New Ecological Paradigm in Systematic and E-mail Samples of College Students," *The Journal of Environmental Education* 36, no. 2 (2005): 23.

Chapter 1

Skiing Through the Ages: From Utilitarianism to Recreation

When I was three-years-old, my parents tied a rope around my toddler waist and skied with me down my first bunny hill, guiding me between their legs. Or so our family legend goes. I have no recollection of these initial forays into the sport; my first memories of skiing begin at a family ski trip to Vermont when I was in first grade. Nevertheless, in the twenty-five winters that have passed since, skiing and the skiing lifestyle have become defining elements in my life. I am not alone. Since the 2002/2003 winter ski season, ski areas have logged an average of 57.5 million skier visits each year.[1] Certainly, not every individual on the slopes aspires to the mountain town, ski bum lifestyle as I do, but we skiers and snowboarders all share one thing in common: we went to the mountains, put skis or snowboards on our feet, and spent time partaking in the joys (or frustrations) of slipping over snow. For this we have the Scandinavians to thank.

The Genesis of Skiing

Although downhill skiing is a relatively novel way of propelling oneself on skis, Nordic, or cross-country, skiing has existed for thousands of years. Indeed, in his book, *The History of Skiing and Other Winter Sports*, Raymond Flower reports that Stone Age rock carvings found in northern Norway depict men on skis hunting elk. In Sweden, a petrified ski discovered by archaeologists was dated to 2,500 BC.[2] Going even further back in time, author John Fry observes that wooden skis were made in Siberia and Scandinavia over six thousand years ago.

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[1] "Home: NSAA," National Ski Areas Association, accessed March 29, 2013, https://www.nsaa.org/. According to Hal Clifford, a skier day is "the standard unit of measure for the industry; it represents one skier or snowboarder using a ski area's facilities for one day." Hal Clifford, *Downhill Slide: Why the Corporate Ski Industry is Bad for Skiing, Ski Towns, and the Environment* (San Francisco: Sierra Club Books, 2002), 6.

[2] Raymond Flower, *The History of Skiing and Other Winter Sports* (New York: Methuen, 1976), 22.

Before humans had developed the ability to write – even before we built the pyramids – we used skis as a means of winter transportation.[3] "By the eighteenth century," writes author Annie Gilbert Coleman, "the Norwegian government had incorporated the sport into its military, forming ski troops to fight Sweden in 1716."[4] Scandinavian peoples even worshipped deities who skied: Ull, the god of winter, was traditionally drawn wearing skis, and the goddess Skadi was associated with winter and skiing.[5] For Scandinavians living in regions with long, snowy winters, skiing came to represent more than a means of facilitating winter travel. It was embodied in their cultures, as evidenced through the concept of *Idraet*. As Hal Clifford, former *Ski* magazine correspondent, explains, "The Swedes and Norwegians who introduced skiing to the United States did not have the word *sport* in their languages. Rather, they referred to the Norwegian *Idraet* or similar Swedish *Idrott* ideal. *Idraet* captured the principle of an outdoor exercise that bred strength, toughness, and manliness."[6]

Although the idea that skiing could be a fun leisure activity would not take hold until the late nineteenth century, cross-country skiing had spread outside of Scandinavia long before then. Skiing arrived in North America in the eighteenth century, when Siberian fur traders used skis for managing their traps in present-day Alaska.[7] It appeared in the US again during the nineteenth century when Norway experienced an economic downturn and many Norwegians emigrated in search of prosperity. While the first Norwegians settled in Minnesota and throughout the northern Midwest, the California Gold Rush lured many further west. Among them was John Tostensen Rue, who changed his name to John Thompson and later became

[3] John Fry, *The Story of Modern Skiing* (Lebanon, NH: University Press of New England, 2006), 4.
[4] Annie Gilbert Coleman, *Ski Style: Sport and Culture in the Rockies* (Lawrence: University Press of Kansas, 2004), 18.
[5] Flower, *History of Skiing*, 22.
[6] Clifford, *Downhill Slide*, 9.
[7] Fry, *Story of Modern Skiing*, 5.

known as Snowshoe Thompson (at the time, Americans called skiing "Norwegian Snowshoeing"). [8] Snowshoe Thompson moved to California in 1851. There, he made his living by delivering mail across the Sierra Nevada, charging two dollars a letter.[9] During the 1860s in Colorado, Father John Dyer delivered mail to high country mining camps on a pair of homemade skis, supplementing the income he made as a Methodist minister. He, along with about fifty other mailmen-on-skis, not only delivered mail to these camps, they provided valuable links to the outside world.[10]

In the western mining camps and mountain towns where Norwegians settled, skiing became a popular form of locomotion. As Gilbert Coleman relates, "Skiing offered a degree of winter mobility in mining regions that eased the constraints of living in the hinterlands and made Norwegian snowshoeing attractive to all local residents, no matter what their cultural background."[11] The Norwegian immigrants taught locals how to make their own skis, and by 1853, one California newspaper reported that area miners traveled exclusively on skis.[12] Similarly, skiing became an increasingly important part of the economies and daily life of isolated mountain towns of Colorado. There, miners commuted to work on skis, and ranchers used skis to tend their animals and complete chores. Women too, especially health workers, used skis for job-related locomotion.[13] Simply put, skiing made mountain living possible.

Skiing also made mountain life more fun. It did not take these hearty, high-alpine residents long to realize that skiing straight downhill was a thrill-inducing endeavor, and it was about the only recreation activity that could be enjoyed during the long winters. John Fry

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[8] Gilbert Coleman, *Ski Style*, 18.
[9] Flower, *History of Skiing*, 63.
[10] Gilbert Coleman, *Ski Style*, 13.
[11] Ibid., 18.
[12] Ibid.
[13] Ibid., 19.

remarks that during the 1860s, harrowing downhill races were popular winter sporting events in mining towns where skiers reached speeds upwards of 60-miles-an-hour by coating the bottoms of their skis with beeswax.[14] Men from different mining camps would compete against each other, and townspeople rallied behind their best skiers. For these individuals, victories assured them "that their town – and, by extension, their mines and businesses – had the most strength, integrity, and promise."[15] Skiing quickly became integral to the community social scene, for both men and women. Towns hosted coed skiing parties. Socially active women, new to life in small mountain towns, filled their leisure time with theatre and literary clubs and, in the winter, skiing. And although skiing held more social importance for women, skill in the sport was admired in both genders.[16]

The recreational aspect of skiing was not limited to the American West. The Norwegians, though they were not traditionally downhill skiers, were avid ski jumpers. Ski jumping became popular in Michigan, Minnesota, Wisconsin, Illinois, and British Columbia.[17] Ski clubs formed across the country and organized ski races and jumping competitions, which attracted visitors and bolstered local economies.[18] A few of these early clubs, such as the Ishpeming, Michigan Ski Jumping club, are still in existence today.[19] Unfortunately, in the West, the boom and bust of the gold and silver mining industries, as well as the arrival of railroad service, led to the demise of both mining camp ski races and the need for skiing mailmen. Formerly bustling mining towns

[14] Fry, *Story of Modern Skiing*, 5.
[15] Gilbert Coleman, *Ski Style*, 24.
[16] Ibid., 23. While the examination of gender roles in skiing is a fascinating and worthwhile pursuit, it is beyond the purview of this paper.
[17] Fry, *Story of Modern Skiing*, 7.
[18] Gilbert Coleman, *Ski Style*, 25.
[19] Fry, *Story of Modern Skiing*, 7.

became ghost towns. It was not until a new wave of Norwegians arrived that skiing would experience a revival in the American West.[20]

Modern Skiing Evolves

Skiing served utilitarian purposes for most of its history. Not until the mid-1800s did the practice begin to evolve into the sport we know today. While ski clubs and ski parties in the United States created a culture of recreational skiing, these skiers still schussed using wooden skis attached to the feet with a lone toe strap.[21] Turning was not graceful, and at high speeds, next to impossible. Stopping was achieved with the aid of a long pole. Downhill skiing may have been fun, but it was also reckless. Modern skiing would come into being with the help of inspired innovations designed by the original skiers themselves: the Norwegians.

The first influential change came when Sondre Norheim, from the Telemark region of Norway, developed a heel strap that held feet more securely on skis.[22] This invention allowed Norheim to create an effective way of turning, known as the Telemark turn. Until then, turning had involved stopping oneself by dragging a long and cumbersome pole through the snow and subsequently stepping around it. Consequently, in Scandinavia, skiing was primarily used for treks across valley floors. The Telemark turn, taken in a lunge position with the uphill foot staggered behind the downhill foot, enabled skiers to turn while traveling downhill. In 1868, Norheim and his friends skied from Telemark to Christiana (present day Oslo) and the Telemark

[20] Gilbert Coleman, *Ski Style*, 26.
[21] Borrowed from the German verb meaning "to shoot," schuss refers to the act of skiing downhill in a straight line.
[22] Fry, *Story of Modern Skiing*, 4.

technique, as well as the idea that skiing could be a diverting leisure activity, began to spread across Europe.[23]

Although we have seen that skiing had already migrated to the United States, it was still relatively unknown in other parts of Europe. In fact, one Swiss miner in California saw his first pair of skis while working in the Sierra Nevada during the 1860s.[24] But in 1888, Norwegian explorer Fridtjof Nansen's crossing of Greenland on skis helped to spark European interest in skiing. According to John Fry, Nansen's book, *On Skis Across Greenland*, published in 1890, "excited the world's imagination about what could be done on skis, so much so that tens of thousands of people took up skiing in countries that had scarcely known of it previously."[25] Norway was the epicenter out of which skiing radiated. As Flower notes, "The development of skiing outside Scandinavia itself, which began in the last years of the nineteenth century, was entirely due to Norwegians and enthusiasts who learnt to ski in Norway and then spread the gospel elsewhere."[26] Among these early enthusiasts were, ironically, the British. In 1864, a Swiss hotel owner convinced some of his British summer clientele to return to St. Moritz for Christmas. They were entranced by the sun, the snow, and the snowsports. Travel agent Henry Lunn and his son, Arnold, an avid skier, further popularized Swiss winter vacations among their compatriots. Skiing continued to take hold in Europe, and ski areas opened throughout the Alps and across the highlands of Austria, Germany, and France. [27]

With this increased interest in skiing came competition, and it was this competition that fueled further innovations in the sport. Long and narrow Nordic skis were well-suited for cross-

[23] Flower, *History of Skiing*, 24; 61-62.
[24] Ibid., 63.
[25] Fry, *Story of Modern Skiing*, 4.
[26] Flower, *History of Skiing*, 28.
[27] Fry, *Story of Modern Skiing*, 7-8.

country travel, low-sloped descents, and wide Telemark turns, but this equipment proved frustrating in the steeper Alps.[28] By 1905, Austrian Mathias Zdarsky had developed a sliding stem turn (now known as the Stem-Christie), made improvements to skis and bindings, and published a book on alpine ski technique. Zdarsky taught his turning style every Sunday on the hills above his hometown, Lilienfeld, where he also held competitions.[29] Hanns Schneider, then Austria's best and fastest skier, began teaching ski lessons in St. Anton, in the Arlberg region of Austria, in 1910. He had developed his own "Arlberg system," which consisted of "a carefully planned progression of turns that resulted in a smooth, fast style of skiing."[30] His students used two poles, and shorter, more maneuverable skis, and his Arlberg system allowed for both faster learning and faster racing.[31]

According to Gilbert Coleman, "skiing had become so popular throughout Europe by 1910, that Norway, Austria, Switzerland, and Germany joined the first international ski association, the Fédération Internationale de Ski (FIS – the International Ski Federation, ski racing's governing body), which sponsored its own competitions."[32] These competitions included both cross-country and downhill races. At the time, modern, tree-cleared ski slopes did not exist; downhill skiers had to find their own paths down the mountain, negotiating trees and other obstacles. This led Brit Henry Lunn to create the first "slalom" race, in which skiers had to turn through a series of poles placed in the snow.[33] In 1928, Lunn and Hanns Schneider organized a new competition which they called the Arlberg-Kandahar, or "A-K." The A-K included both a downhill and a slalom race, and the skier with the best combined time for the

[28] Flower, *History of Skiing,* 64 – 65.
[29] Ibid., 66.
[30] Gilbert Coleman, *Ski Style,* 44.
[31] Ibid.
[32] Ibid.
[33] Ibid.

two races was the winner.[34] Given the success of the A-K races, Lunn and Schneider appealed to the FIS to recognize downhill and slalom skiing as distinct disciplines separate from Nordic skiing. In 1931, FIS granted this request by sponsoring the first World Championship of Alpine Skiing.[35] There would still be tension and dispute between Nordic skiing purists and Alpine enthusiasts, but from that day forward, Alpine skiing officially became a sport.

Downhill Skiing in America: The Early Years

Although skiing's popularity in the West waned after the mining bust, the sport maintained a presence in the Midwest and, increasingly, in the Northeast. Immigrants from Scandinavia continued to make the trip across the Atlantic. In fact, "between 1880 and 1889, almost 680,000 immigrants came from Norway, Sweden, and Denmark to America, making up the fourth largest immigrant group of the decade and 12.7 percent of the period's total immigration."[36] Norheim himself was among these new arrivals. Many of these Scandinavian immigrants settled in the Midwest and started local ski clubs. They also formed America's first ski association in 1891. The founding of the American Ski Association, based in Ishpeming, Michigan, followed in 1905. Wisconsin hosted the US cross-country championships in 1907.[37] Students at Dartmouth, Williams, Middlebury, Harvard, Yale, and other New England colleges started ski teams.[38] Across the country, interest in outdoor recreation surged, and outdoors clubs

[34] Fry, *Story of Modern Skiing*, 8. While both downhill and slalom races involve skiing between poles set intervals apart, the poles in slalom skiing are set closer together than the poles in downhill racing; the emphasis in slalom racing is on turn technique, while the emphasis in downhill races is on speed.
[35] Ibid., 9.
[36] Gilbert Coleman, *Ski Style*, 28 – 29.
[37] Flower, *History of Skiing*, 116.
[38] Gilbert Coleman, *Ski Style*, 30.

began forming. In 1912, Mary Sabin and James Grafton Rogers started the Colorado Mountain Club which sponsored yearly skiing trips to Estes Park, Colorado.[39]

Whereas the railroad obviated the need for skiing mailmen in the West, it made skiing more accessible for thousands of skiers in New England. In 1927, two Canadian rail lines offered service from Montreal to the Laurentian mountains of southern Quebec. Then, in 1931, the first ski trains began service from Boston to ski hills in Maine, New Hampshire, Vermont, the Berkshires of western Massachusetts, and the Pennsylvanian Poconos. By the mid-1930s, tens of thousands of skiers were travelling to Northeastern ski areas by rail, and ski train routes opened up across the continental United States and Alaska. The services were so popular that "in the first three months of 1936 alone, almost seventy thousand skiers entrained from New York City for the mountains of the Northeast.[40]

Technique was improving, too. American who had learned to ski at European ski schools, such as Schneider's school in St. Anton, introduced European skiing technique to the United States. Ski area owners who befriended European instructors brought them to America and set up their own ski schools. German Otto Schniebs, renowned for his view of skiing as a way of life, taught the Arlberg technique at the Appalachian Mountain Club from 1928 to 1929 and began coaching the Dartmouth ski team in 1930. In 1935, Otto Lang, an instructor from St. Anton, was invited by a former client to open a ski school at Sugar Hill in New Hampshire. He became the first St. Anton instructor in the United States, and many more would follow. Along with their teaching skills, these instructors imported their passion for skiing and competition and

[39] Gilbert Coleman, *Ski Style*, 30.
[40] Fry, *Story of Modern Skiing*, 14.

knowledge of resort culture and operations. They "acted as catalysts for the explosive growth of American skiing in the 1930s, and others arrived in response to that growth."[41]

Although skiing was gaining converts across the United States, until the early 1930s, a day of skiing downhill first required the skier to slog up the hill. That all changed in 1931, when Alex Foster, a ski jumper from Montreal, invented the rope-tow. This first rope-tow "consisted of a four-cylinder Dodge sedan car jacked up on two low cement blocks, with 2,400 feet of hemp rope running around one tireless rear wheel rim and along pulleys."[42] Skiers grabbed on to the rope with their hands and hung on as best they could until they reached the top of the hill (or fell off). One trip cost five cents; a full day's ticket twenty-five.[43] According to *Ski Magazine*, rope tows were the Ford Model-T of skiing, and like the ski trains, the rope-tow technology quickly spread to New England, the Midwest, and California. [44] Skiers flocked to rope-tow-served hills. Sensing an opportunity, enterprising individuals built warming huts at the bottom of the hills and sold hot dogs and hot chocolate. "Thus," writes Fry, "was born the ski area in North America."[45]

Back in Europe, ski areas had evolved differently. Villages in the Alps already possessed lodging infrastructure close to the slopes, built to meet the summer tourism demand. Furthermore, these small communities were well connected with high alpine cog railways and funiculars and did not need rope-tows to convey skiers uphill. When they did install lifts on the ski slopes, they eschewed the rope-tow in favor of drag-lifts like the J-bar and the Pomalift, which pull the skier uphill by supporting his/her bottom.[46] Americans who had taken winter ski vacations in the Alps returned to the rather unglamorous ski hills of the United States. These

[41] Gilbert Coleman, *Ski Style*, 50.
[42] Fry, *Story of Modern Skiing*, 16.
[43] Ibid.
[44] Flower, *History of Skiing*, 120.
[45] Fry, *Story of Modern Skiing*, 17.
[46] Ibid.

skiers knew what a European-style ski resort looked like and were eager to have the same amenities. Averell Harriman, owner of the Union Pacific Railway, was happy to oblige.

According to Fry, Harriman "used his Union Pacific Railway to create Sun Valley in Idaho, the first North American destination ski resort built from the ground up."[47] He even hired Austrian Count Felix Schaffgotsch to help him find the perfect location, since it would take a European eye to construct a proper ski resort. [48] Schaffgotsch scouted locations across the American West before discovering the skiable potential of Ketchum, Idaho. He reportedly told Harriman that the location was more delightful than any other location he had seen in the United States, Switzerland, or Austria. And so in 1936, "Sun Valley emerged as America's first pre-packaged, custom-built resort, complete with an Austrian-staffed ski-school and a chair lift designed by a banana loading expert who used the same principles for transporting humans as for bunches of bananas."[49]

As with previous innovations, the chairlift concept quickly took off, and chairlifts were installed at ski areas such as Gunstock, New Hampshire, and Alta, Utah. The first aerial tram was built at Cannon Mountain, New Hampshire, in 1938.[50] Before World War II began, US ski areas counted between two- and three-hundred rope-tows and nineteen chairlifts. While the war temporarily halted the growth of the ski industry, it would also influence the future of American skiing.[51]

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[47] Fry, *Story of Modern Skiing*, 17.
[48] Ibid.
[49] Flower, *History of Skiing*, 123.
[50] Fry, *Story of Modern Skiing*, 17 – 18.
[51] Ibid., 22.

Innovation in the Post-War Years

Skiing took a back seat during World War II, as resources like steel were diverted to the war effort, and gas rationing limited people's ability to travel to ski areas.[52] Nevertheless, a very important group of people was still practicing the sport in the mountains of Colorado. The 10th Mountain Division was an elite group of fourteen thousand men who were trained to fight in harsh alpine conditions. Hal Clifford describes their training, noting that it "included extensive rock climbing and skiing practice at Camp Hale, near the Continental Divide at the headwaters of the Eagle River in central Colorado. . . . Soldiers from the Tenth would practice for weeks on end in the high country, skiing, maneuvering, and bivouacking in brutal winter conditions above ten thousand feet."[53] While serving overseas, the men daydreamed about the ski areas and ski schools they would open once the war ended.[54] The 10th Mountain Division veterans were integral to rekindling the ski industry after the war. As Clifford remarks, "Approximately two thousand veterans of the Tenth went on to help create the postwar ski industry; ultimately, sixty-two American ski resorts were founded, managed, or had their ski schools run by these men."[55]

Yet, at this point in skiing's history, the sport still demanded of skiers a certain degree of tenacity and hardiness. Skis were wooden and prone to warping and breaking, and steel edges came apart easily. Winter clothing did not do much to warm shivering bodies. Leather ski boots left feet frostbit and tended to both shrink and expand. Bindings were fondly referred to as "bear traps." Mother Nature was the only purveyor of snow, and ski slopes were untamed and full of obstacles. Even though the glitzy and European-like Sun Valley resort had opened in 1936, New

[52] Fry, *Story of Modern Skiing*, 23.
[53] Clifford, *Downhill Slide*, 13.
[54] Fry, *Story of Modern Skiing*, 23.
[55] Clifford, *Downhill Slide*, 13.

England ski areas were only just getting around to installing flush toilets in the early 1950s.[56] However, this was all soon to change. Skiing was about to experience a frenzy of innovations in technology and technique, leading to another surge in popularity, which would in turn inspire the Manifest Destiny-like proliferation of ski resort development.

Three men in particular revolutionized the sport of skiing: Howard Head, Bob Lange, and Ed Scott. Anyone familiar with the ski industry today will recognize these names, even without prior knowledge of their individual contributions to the sport. Howard Head made it his mission to change the way the world skied by changing skis themselves. Thanks to his dogged persistence, and after much trial and error, he manufactured a ski made of aluminum alloy sheets with a plywood core, vertical sidewalls, steel edges, and a top-sheet, all held together with flexible adhesives. This ski made edging and turn initiation so easy, people called it the "cheater."

Ski boots, too, were in desperate need of a redesign. Leather boots did not offer much protection against the elements. So poor was their ability to insulate that British skiing fiend Arnold Lunn remarked that rubbing one's cold-numbed feet in the snow helped to revive circulation.[57] The first modest improvement came in the 1950s "with the introduction of the double boot, a soft, lace-up boot inside the hard outer shell. The inner boot held the foot in place without subjecting the skin to the harsh pressures of rubbing up against the hard outer shell." [58] Although the materials have changed, this is the same design concept used for ski boots today. These double boots were significantly warmer, but they still were incapable of effectively transferring to the ski subtle changes in foot pressure. Robert Lange, another determined

[56] Fry, *Story of Modern Skiing*, 25.
[57] Flower, *History of Skiing*, 177.
[58] Fry, *Story of Modern Skiing*, 81.

inventor, was responsible for developing the polyurethane boots that would change the ski world.[59] Ski poles, too, underwent a dramatic change in form. Made of bamboo until 1959, they were flimsy and rather useless. Then Ed Scott, a ski shop owner from Sun Valley, developed an aluminum alloy pole that resisted breaking and enabled accurate pole planting.[60]

The innovations continued. Bindings were improved, which reduced the number of ski-related tibia fractures by 85 percent between 1970 and 1985.[61] Ski brakes were invented and became standard. Skis themselves got shorter and shorter, which also reduced injury and increased maneuverability. Another major breakthrough came in the 1990s with the development of shaped skis, which made turn initiation even easier. Skis became wider, too, making the thrill of skiing deep powder accessible to a greater number of skiers. As Fry writes, "The improved equipment opened the way to techniques that enabled people to ski with greater efficiency and less effort."[62]

With each of these improvements, skiing became easier to learn, and as a result, more and more people were trying the sport. In fact, "in the two decades of the 1950s and 1960s, participation in skiing grew at 15 percent annually, which is to say that the sport was doubling in size every five or six years. In the winter of 1962 – 1963, one of every five people on the slopes was skiing for the first time, and three out of five had skied for fewer than five years."[63] In order to meet this rapidly growing demand, ski areas popped up all over the country. During the 1955/1956 ski season, there were 78 ski areas in the United States. Just ten years later in 1965/1966, North America offered 662 places to go skiing. Within the same ten year period,

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[59] Fry, *Story of Modern Skiing*, 83.
[60] Ibid., 80.
[61] Ibid., 88.
[62] Ibid., 91.
[63] Ibid., 33.

1,392 new chairlifts and surface lifts were installed.[64] Between 1962 and 1963, several big name resorts opened for business, including Vail and Crested Butte in Colorado; Jackson Hole, Wyoming; and Park City, Utah. Concurrently, air travel was decreasing in price, and people from all over the country could fly to a destination resort in as much time as it took them to drive to their local hill. Once the Eisenhower Tunnel in Colorado was completed in 1972, an east-west corridor linking Colorado's Front Range with the Western Slope, skiers had open highway access to formerly remote locations in the High Rockies.[65] Ski areas in Colorado sold 204,640 lift tickets in 1955. Just fifteen years later, in 1970, they sold over five million.[66] The rapidly increasing demand for skiable acres led to the abandonment of small mom-and-pop ski hills in favor of sprawling resorts offering a wide variety of amenities such as food and lodging. The US ski industry was born.

Today, ski areas across America typically host between 55 and 60 million skier days per season, with the Rocky Mountain region (Montana, Idaho, Wyoming, Colorado, Utah, and New Mexico) alone receiving roughly 20 million visits in a single season.[67] Of these, Colorado consistently ranks as the most popular ski state, boasting more than half of the Rocky Mountain region's skier visits.[68] For each of these states, especially Colorado, skiing is big business. Over the course of the 2010/2011 season, the ski industry employed 187,900 individuals nationwide and added $10.7 billion in value to the national economy. Colorado's ski industry alone

[64] Fry, *Story of Modern Skiing*, 50.
[65] Ibid., 58.
[66] Michael W. Childers, *Colorado Powder Keg: Ski Resorts and the Environmental Movement* (Lawrence: University Press of Kansas, 2012), 7 – 8.
[67] Jason Blevins, "U.S. Ski Resorts' 2012 – 13 Season: Areas Report Strong Rebound," *The Balance Sheet* (blog), *Denver Post*, May 1, 2013, accessed June 24, 2013, http://blogs.denverpost.com/thebalancesheet/2013/05/01/us-ski-resorts-report-strong-rebound-for-2012-13-season/9375/#more-9375.
[68] Childers, *Colorado Powder Keg*, 6.

accounted for 37, 838 employees (more than any other state by a margin of nearly fourteen thousand) and received $2.1 million dollars in value added to its state economy.[69]

The meteoritic rise in skiing's popularity coincided with the birth of the modern environmental movement in the United States. Historian Michael Childers notes that "by the late 1950s, a nascent environmental movement came to focus on suburban middle class quality-of-life issues such as the preservation of wilderness and open space."[70] Over the next decade, the environmental movement gained traction, and issues such as clean air, clean water, chemical and pesticide use, and suburban sprawl increasingly concerned middle-class Americans.[71] These ideals were reflected in national legislation, beginning with the Wilderness Act of 1964 and followed by the establishment of the Environmental Protection Agency (EPA) in 1970, the National Environmental Policy Act of 1970, the Clean Air Act of 1972, and the Endangered Species Act of 1973. Up until this new era of environmentalism, ski area owners could clear-cut their slopes without regulatory oversight. With the enactment of these laws, ski areas operating on public lands were all subject to NEPA review.

[69] Elizabeth Burakowski and Matthew Magnusson, *Climate Impacts on the Winter Tourism Economy in the United States* (New York: Natural Resources Defense Council, 2012), 25, accessed February 16, 2013, http://www.nrdc.org /globalwarming/files/climate-impacts-winter-tourism-report.pdf.
[70] Childers, *Colorado Powder Keg*, 64.
[71] Ibid.

Chapter Two

The Environmental Impacts of the West's New Extractive Industry

The allure of skiing is a combination of the thrill of fast descents, the challenge of steep terrain, the physical activity, the camaraderie, the boisterous and booze-filled après-ski scene, the beauty of high alpine scenery, the crisp white snow, the pungent smell of the evergreen trees, and the ability to access places unreachable by car. At its essence, skiing is a natural experience, yet the modern ski industry is charged with causing damage to the natural environments upon which it relies for its existence. These days, as journalist Hal Clifford writes, "the ski industry is a highly developed form of industrial tourism that exacts an enormous toll on the natural environment through the process of selling experiences." [1] As more resorts opened through the 1960s, '70s, and '80s, and increasing amounts of national forest land were converted to ski slopes, the environmental impacts of the ski industry became harder to ignore.

For many of the ski areas in the western United States, the growth of the ski industry has both relied upon and been frustrated by the United States Forest Service. Writing in the *Virginia Environmental Law Journal*, attorney Wayne McKinzie relates that much of the federal land in the American West was given away to homesteaders, railroaders, and others who desired the low-lying flat lands. [2] Unwanted, the left-over mountainous properties remained under federal control, and much of this land was later acquired by the US Forest Service via the Transfer Act of 1905. Currently, national forests and grasslands occupy 193 million acres across forty-two states and Puerto Rico. According to conservation historians William Shands and Robert Healy,

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[1] Clifford, *Downhill Slide*, x.
[2] C. Wayne McKinzie, "Ski Area Development after the National Forest Ski Area Permit Act of 1986: Still an Uphill Battle," *Virginia Environmental Law Journal* 12, no. 2 (Winter 1993), 302.

there are only fifty national forests east of the 100th meridian, historically used to mark the distinction between the eastern and western United States.[3] While national forest land in the West was already held in federal land reserves, most of the East's forests were purchased from private owners, which is why the vast majority of national forest and grassland is located in the American West. Indeed, 165 million acres of national forest land lies within the eleven westernmost United States.[4] Counting 167 ski areas among them, it should come as no surprise that many of the nation's best, highest, and most popular ski resorts are found in the national forests scattered across these states.[5] In fact, 90 percent of the ski areas in the American West are located on lands administered by the Forest Service.[6] These ski areas also happen to account for the majority of skier visits in the United States each year.[7]

Outdoor recreation was not always embraced on public lands, however. In fact, before World War I, the Forest Service operated under the institutional belief that its primary function was to efficiently manage the mining, timber, and grazing industries. Recreation was viewed as a secondary use of the national forests because, at the time, no one thought that recreation could ever match the economic importance of these extractive industries. Indeed, many foresters believed "that providing recreational development would take away from the agency's primary

[3] William E. Shands and Robert G. Healy, *The Lands Nobody Wanted*, (Washington, DC: The Conservation Foundation, 1977), 1.
[4] James Briggs, "Ski Resorts and the National Forests: Rethinking Forest Service Management Practices for Recreational Use," *Boston College Environmental Affairs Law Review* 28 (2000), 88 – 89. These states include: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.
[5] Jorge Rivera and Peter de Leon, "Is Greener Whiter? Voluntary Environmental Performance of Western Ski Areas," *Policy Studies Journal* 32, no. 3 (2004): 419.
[6] "How are Ski Areas Graded?" Ski Area Citizens' Coalition, accessed June 24, 2013, http://www.skiareacitizens.com/index.php?nav=how_we_grade.
[7] US Department of Agriculture, Forest Service, White River National Forest, "Affected Environment and Environmental Consequences," in *Final Environmental Impact Statement Volume 1 for the White River National Forest Land and Resource Management Plan 2002 Revision* (Glenwood Springs, CO: White River National Forest), 3-436, accessed June 24, 2013. http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_001033.pdf.

objective of providing sustainable forestry and grazing on the nation's public lands."[8] Not only that, but many Americans also did not have easy access to national forest land.

Once the war ended, however, the usage patterns of public lands began to shift. With an increase in car ownership, partnered with improving road conditions, "thousands of middle-class tourists and their automobiles descended upon their national forests and national parks in unprecedented numbers."[9] This led Forest Service officials to rethink their stance on recreation within public lands, and in 1917, they hired a landscape architect to study the economic potential for the recreational use of the national forests.[10] In the resulting report, Frank Waugh concluded that, contrary to the prevailing opinion held by the Forest Service, recreation stood to earn the agency about $7.5 million annually. "In general terms," he reported, "it appears that the recreation use of National Forests has a very substantial commercial value, and that recreation stands clearly as one of the major Forest utilities."[11] Whereas 2.4 million people had visited a national forest in 1916, by 1921, roughly six million Americans were visiting national forests every year.[12] So great was the influx of visitors to these areas that in 1921, then Forest Service Chief William Greeley proclaimed that recreation was indeed a major use of national forests.[13] Over the next few decades, traditional extractive industries were further outpaced by the explosive growth in outdoor recreation.

Echoing the words of another former Forest Service Chief, Henry Graves, historian Michael Childers remarks that "The nation's 'spontaneous movement for outdoor recreation'

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[8] Childers, *Colorado Powder Keg*, 16.
[9] Ibid., 15.
[10] Ibid., 16.
[11] Frank Waugh, *Recreation Use on the National Forests* (Washington, DC: United States Forest Service, 1918), 26 – 27.
[12] Childers, *Colorado Powder Keg*, 11.
[13] Ibid., 17.

fatefully coincided with the growing popularity of skiing."[14] Indeed, the Forest Service has been active in ski area planning and development since the 1920s when it first began constructing small ski areas serviced by rope-tows. But faced with the sport's popularity growing, and with it, the demand for high quality places to ski, the Forest Service decided that ski area development would be more effective by entering "into partnerships with the private sector to construct and operate ski areas on national forests. The Forest Service permitted the occupancy of National Forest System lands, while the private sector provided the capital to construct facilities."[15]

Although the permit terms and conditions have changed over the years, the general idea has not. Presently, under the National Forest Ski Area Permit Act of 1986, the Forest Service can grant ski areas special use permits for terms of up to forty years. These permits allow construction and operation of ski areas within boundaries deemed large enough to accommodate resort operations and facilities.[16] Each permitted area pays a fee to the Forest Service based on its annual income. Thus it is safe to assume that larger, more popular areas pay higher annual fees to the Forest Service. These land use fees generate between $17 and 19 million each year in federal revenues.[17] For example, in 1998, Vail Mountain paid $2.6 million in rent to the Forest Service. To give an idea of the staggering amount of money Vail earns each year, this sum only represented four percent of the resort's gross revenues, which is the maximum amount the Forest Service can charge a single area.[18]

Ski areas operating with special use permits must also provide the Forest Service with both a Master Development Plan (MDP) and an operating plan. The MDP describes the current

[14] Childers, *Colorado Powder Keg*, 11.
[15] US Department of Agriculture, "Affected Environment," 3-436.
[16] Ibid., 3-436 – 3-437.
[17] Clifford, *Downhill Slide*, 135.
[18] Ibid., 136.

condition and existing on-mountain facilities as well as the desired condition and proposed improvements each area operator hopes to initiate within the permit boundary during the fifteen-year period of the plan. MDPs define the long-term goals for a ski area, thus providing local stakeholders with pertinent information about how they might be affected by future projects.[19] Proposed MDPs are approved by each National Forest unit after Forest Service officials review the plan to make sure it meets the Forest's own goals and objectives. However, approval does not imply authorization; development projects must still undergo a full environmental review, as explained below. Operating plans are submitted for Forest Service approval annually, and "describe the authorized winter and summer operation of each ski area and include such things as the types of activities allowed, avalanche control procedures, vegetation management plans, erosion control techniques, boundary management plans, general safety, sanitation procedures, and special events such as ski races or summer concerts".[20]

Ski areas operating on national forest land must comply with federal environmental policies, most notably the National Environmental Policy Act (NEPA) signed into law by President Nixon on January 1, 1970. In acknowledgement of years of environmental neglect and degradation, NEPA "was established to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans."[21] Seeking to balance environmental, social, and economic concerns, NEPA requires the completion of environmental impact assessments for all proposed federal projects and actions.

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[19] "Ski Area Master Development Plans," US Department of Agriculture, Forest Service, White River National Forest, accessed June 24, 2013, http://www.fs.usda.gov/detail/whiteriver/landmanagement/planning/?cid=STELPRDB5333326.
[20] US Department of Agriculture, "Affected Environment," 3- 437.
[21] "National Environmental Policy Act," Council on Environmental Quality, accessed June 8, 2013, http://ceq.hss.doe.gov/welcome.html.

The information gathered for NEPA compliance is used by federal agencies for, ideally, more effective and thoughtful decision-making.[22]

The NEPA process begins when a federal agency develops a proposal for an action and must determine whether or not this action will impact the human environment. This determination is reached through one of three paths of analysis: a Categorical Exclusion, an Environmental Assessment (EA), or an Environmental Impact Statement (EIS). An EA is used "to determine if a proposed action or its alternatives have potentially significant environmental effects."[23] When the outcome of an EA indicates that an action will indeed have significant effects, the agency must then complete a full EIS. The EIS is a much more rigorous evaluation of an action's environmental impacts and includes the comparison of the proposed action with reasonable alternatives (ranging from no action to full development), solicitation of input from locally affected stakeholders, and unbiased explanations of the direct, indirect, and cumulative environmental impacts. An EIS also defines steps to take to mitigate these impacts.[24]

Gone are the days when ski area operators could free-spiritedly cut their own ski trails, install chair lifts, and build mountain lodges wherever they desired. Now, ski areas seeking to initiate development projects on federally managed lands must first examine and submit for governmental and public review the environmental effects ski area development – including lifts, lodges, trails, and snowmaking – has on the mountains.[25] Combined with meeting Endangered Species Act and Clean Water Act regulations, the environmental review is often an expensive and lengthy process, paid for by the resort, but completed by the local Forest Service unit which then selects the preferred alternative. Childers notes that an EIS can take years and untold

[22] "National Environmental Policy Act," Council on Environmental Quality.
[23] Ibid.
[24] Ibid.
[25] Gilbert Coleman, *Ski Style*, 194.

amounts of money to complete, which has discouraged the development of any new major resorts since Beaver Creek opened in the early 1980s.[26] Although not all of the ski areas in the United States lie within Forest Service property, analyzing a ski area's prepared EIS gives great insight into the environmental impacts of ski area development.

Writing in the journal, *Global Environmental Change*, researcher Stefan Gössling relates that "tourist activities impact directly and indirectly on ecosystems."[27] Ski areas are no exception. In fact, in 2003, Aspen Skiing Company's Vice President of Sustainability, Auden Schendler, opined, "Guest-service businesses that operate in sensitive environments, such as ski resorts, may be among the largest contributors to the environmental burdens in their communities."[28] The Forest Service itself acknowledges that "ski areas require intensive development and maintenance."[29] Even the US Environmental Protection Agency has weighed in on the environmental impacts of ski areas, noting, "No other land management prescription on the Forest directly results in more stream-water depletion, wetland impacts, air pollution, permanent vegetation change, or permanent habitat loss."[30] Generally speaking, ski area operations affect five main environmental categories: soil and vegetation, water, energy use and emissions, wildlife habitat, and development.

Much of the following information regarding the environmental impacts of skiing comes from the Environmental Impact Statement for the White River National Forest Plan for 2002. The White River National Forest is located in north-central Colorado and encompasses nearly

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[26] Childers, *Colorado Powder Keg*, 90.
[27] Stefan Gössling, "Global Environmental Consequences of Tourism," *Global Environmental Change* 12, no. 4 (December 2002): 283.
[28] Auden Schendler, "Applying the Principles of Industrial Ecology to the Guest-Service Sector," *Journal of Industrial Ecology* 7, no. 1 (2003): 128.
[29] US Department of Agriculture, "Affected Environment," 3-13.
[30] Cynthia Cody, letter to Martha Ketelle, May 9, 2000, quoted in Clifford, *Downhill Slide*, 77.

2.3 million acres.[31] It is not only one of the country's largest and oldest national forests (established in 1891), but it is also one of the most visited. Home to twelve of the United States' biggest and most well-known ski resorts, including Aspen, Beaver Creek, Breckenridge, Keystone, Snowmass, and Vail, "the White River National Forest provides 64 percent of the skiing in Colorado and 13 percent of the national total."[32]

Soil and Vegetation

The Forest Service reports that "management actions with the greatest potential to affect soils are those that involve ground disturbance or vegetation removal."[33] With respect to ski resorts in particular, these activities include timber harvesting, slope contouring, road construction, and recreation, each of which has the negative effect of compacting soil. Creating ski trails often involves removing all of the trees in the path of the trail design. In some cases much greater swaths of forest are clear-cut. For example, in the late 1990s, Vail Mountain clear-cut 885 acres of forest for its Category III expansion. The process of harvesting trees compacts soil both by transporting the felled trees across the ground and later piling them. Unpaved roads are necessary to transport timber out of a felled area and for high-mountain access. Vehicles traveling along these roads further compress soils, which are especially susceptible to erosion during snowmelts and after rain.[34] Furthermore, Sonja Wipf and her co-authors emphasize the severe impacts of mechanical slope contouring, a process through which new ski slopes are

[31] US Department of Agriculture, Forest Service, White River National Forest, "Summary of the Final Environmental Impact Statement" in White River National Forest Land and Resource Management Plan 2002 Revision, Final Environmental Impact Statement, Volume 1 (Glenwood Springs, CO: White River National Forest, 2002), 5, accessed June 24, 2013, http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_001099.pdf.
[32] US Department of Agriculture, "Affected Environment," 3-435.
[33] Ibid., 3-17.
[34] Ibid., 3-45 – 3-48.

smoothed to remove obstacles and hazards, such as shrubs or boulders.[35] Contouring irrevocably alters the composition of the soil and vegetation found on ski slopes. This is especially damaging in areas with ecologically sensitive or scarce plant populations. Indeed, the Forest Service admits that, "the impacts to soils from ski area development are more severe than those of other activities because of their intensity and permanence."[36]

Soil compaction is ecologically detrimental because it "can reduce productivity and other soil functions by impairing infiltration, root growth, and soil organisms. Soil compaction can also lead to increased erosion resulting from reduced infiltration and increased overland flow."[37] Compacted soil does not absorb moisture as efficiently as soil in its naturally un-compacted state. Therefore, water runs over this soil at a faster rate, which in turn increases soil erosion. When the topsoil and hummus are eroded away, long-term soil productivity is compromised.[38] When snow melt or rain storms transport eroded soil to water bodies, water quality suffers due to increased sedimentation. Sedimentation occurs when too many foreign particles accumulate in running water such that they can no longer be transported by the current. Rather, these particles settle to the bottom of the water body, thus impeding flow rates, reducing pool depths, reducing reservoir capacity, and negatively impacting aquatic life. Sedimentation also increases water treatment costs.[39]

Because plants require soil in which to grow, any soil disturbance will necessarily disrupt the vegetation living in that soil. However, detrimental effects to vegetation will be greater below

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[35] Sonja Wipf et al., "Effects of Ski Piste Preparation on Alpine Vegetation," *Journal of Applied Ecology* 42 (2005): 306.
[36] US Department of Agriculture, "Affected Environment," 3-17.
[37] Ibid., 3-13.
[38] Ibid., 3-17.
[39] Ibid., 3-45.

tree-line than above.[40] In their study of the ski slopes at twelve Swiss resorts, Wipf et al. determined that plants on ski slopes did not grow as successfully as plants adjacent to ski slopes. Furthermore, "the pistes [slopes] … had a negative effect on the species richness in alpine grassland and dwarf shrub vegetation."[41] They contend that, "all types of ski piste management cause deviations from the natural structure and composition of alpine vegetation, and lead to lower plant species diversity."[42]

Water

Healthy watersheds are important for maintaining functioning ecosystems and ensuring water quality and supply. Ski resort operations impact water resources in much the same way they impact soils and vegetation. Indeed, as we have seen with the process of sedimentation, the negative impacts on water are often a consequence of modifications to soils and vegetation. Human-caused disturbances such as changing or removing vegetation, water flow reduction, pollution, soil compaction, and altering topography can all be damaging to local watersheds by affecting "water quality and quantity, fish and wildlife habitat, slope stability, and soil productivity."[43] In their analysis of hydrology and water quality at two northeastern US ski areas, Beverly Wemple and her co-authors describe four different ways in which ski area development impacts watersheds differently than traditional forestry management: Clear-cutting ski trails accelerates run-off and is a permanent alteration of the landscape; activities such as snowmaking are unique to ski areas; and development in general increases the amount of impervious surfaces,

[40] US Department of Agriculture, "Affected Environment," 3-82.
[41] Sonja Wipf, et al., "Effects of Ski Piste Preparation," 308.
[42] Ibid., 306.
[43] US Department of Agriculture, "Affected Environment," 3-22.

which also affects run-off.[44] Lastly, "runoff from real estate developments or seepage from wastewater can increase microbial, chemical, and thermal pollution in streams, lakes, and groundwater."[45]

Increased sedimentation, pollution from chemicals, and depleted water flows can wreak havoc on aquatic life in flowing water. Faced with damaged habitats, "the response of the macroinvertebrate community is typically a reduction in the number of species which occur there and especially the number of sensitive species."[46] Fish, too, suffer from depleted waters. Brook and brown trout are both spawning fish species that can be found in the water of the White River National Forest. The ability of these fish to successfully reproduce depends on reliable water flows, which can be impaired by resort activities.[47] On a positive note, watersheds, aquatic habitat, and clean drinking water are protected by Federal law, notably under the Clean Water Act, the Endangered Species Act, and the Safe Water Drinking Act. Any ski area development on federal land must adhere to these regulations.[48]

The White River National Forest supplies water for various consumptive activities, including agriculture, potable water for municipalities, and recreation. If one thinks about possible recreational uses of water in national forests – camping, fishing, boating, etc. – it might come as a surprise that "the most significant recreational consumptive use of forest water is for ski resort operations, especially snowmaking."[49] Conceptualized in the 1950s and improved upon ever since, ski resorts make snow in an effort to supplement natural snow fall. Often begun in

[44] Beverly Wemple, et al., "Hydrology and water quality in two mountain basins of the northeastern US: assessing baseline conditions and effects of ski area development," *Hydrological Processes* 21 (2007): 1639–1650.
[45] Briggs, "Ski Resorts and the National Forests," 99.
[46] US Department of Agriculture, Forest Service, White River National Forest, Dillon Ranger District, *Final Environmental Impact Statement for the Breckenridge Ski Resort Peak 6 Project* (Silverthorne, Colorado: 2012), 339.
[47] US Department of Agriculture, "Affected Environment," 3-188.
[48] Ibid., 3-22 – 3-23.
[49] Ibid., 3-27.

autumn, snowmaking helps resorts guarantee opening dates and early season skiing.[50] Ski industry researcher Daniel Scott emphasizes that the importance of snowmaking to North American ski resorts cannot be understated. The results of a study he co-authored determined that snowmaking more than doubled the average length of the ski season, from fifty-five to 106 days, between 1961 and 1990.[51] Moreover, some areas, for instance Ski Roundtop in south-central Pennsylvania, rely almost completely on artificially produced snow.

While there are two different types of snowmaking equipment, the processes are essentially the same: water is pumped uphill from a source, either a body of flowing water or a storage reservoir, to a snow gun. There it is mixed with cooled compressed air which propels the water into the outside air. As the water is sprayed into the winter air, it freezes into droplets which fall to the ground as snow. This human-made snow does not have the same six-sided structure as natural flakes, but it is skiable.[52] Journalist and author Daniel Glick calls snowmaking the ski industry's alchemy – "it turns plain river water into white gold."[53]

The miracle of snowmaking is water intensive. In 2002, resorts across the White River National Forest used 2,106 acre-feet of water for their snowmaking operations – that is enough water to cover 2,106 acres of land with one foot of snow.[54] Daniel Glick, in his 2002 book about arsons at Vail Mountain, describes the snowmaking set up at Vail: "To provide snow, even if Mother Nature doesn't, VA [Vail Associates] has installed sixty-one miles of underground pipe at Vail alone that transport 2,000 gallons of water each minute out of Gore Creek and another

[50] US Department of Agriculture, "Affected Environment," 3-285.
[51] Daniel Scott, "US Ski Industry Adaptation to Climate Change," in *Tourism & Global Environmental Change: Ecological, Social, Economic, and Political Interrelationships*, ed. Stefan Gössling and C. Michael Hall, 242 – 285 (London: Routledge, 2006), 267.
[52] "How Snowmaking Works," Roundtop Mountain Resort, accessed June 11, 2013, http://www.skiroundtop.com/how-snowmaking-works.
[53] Daniel Glick, *Powder Burn: Arson, Money, and Mystery on Vail Mountain* (New York: Public Affairs, 2001), 188.
[54] US Department of Agriculture, "Affected Environment," 3-27.

2,000 gallons each minute from the Eagle River, twenty-four hours a day, seven days a week, from late October until, usually, after New Year's."[55] As the Environmental Impact Statement acknowledges, "Generally, the greater the area devoted to ski area development, the greater is the risk to watershed resources."[56]

In his book, Hal Clifford quotes a former Breckenridge Ski Resort spokesperson as saying, "Make snow and they will come. … Snowmaking allows us to open in October and gives us a reputation for having a long season with good snow."[57] These days, resorts do not typically open in October, but they do race to open by Thanksgiving week, thus relying on snowmaking most heavily in late fall and early winter. Unfortunately, fall and winter happen to be critical seasons for fish and other aquatic species. The brook and brown trout spawn in the fall, but as decreasing water levels expose streambeds to the open air, their eggs can dry out or freeze. Low-flow levels also kill off aquatic invertebrates. Furthermore, low water levels accelerate the development of anchor ice, "which adheres to the bottom of rivers and renders them uninhabitable, forms in shallow water and effectively sterilizes even more stream bottom."[58] And, as the water becomes shallower, fish have fewer deep pools in which they can over-winter.[59] Minimum stream-flow requirements exist in some states, regulating the minimum amount of water that can be present in a stream at any one time. Or, as Glick phrases it, ensuring "they leave just enough water so the fish don't have to learn to breathe oxygen."[60] Yet, Clifford notes that these regulations are often both arbitrary and insufficient. Indeed, he reports that the Army Corps of Engineers deemed Colorado's minimum stream-flow requirements insufficient to

[55] Glick, *Powder Burn*, 187.
[56] US Department of Agriculture, "Affected Environment," 3-48.
[57] Clifford, *Downhill Slide*, 181.
[58] Ibid., 182.
[59] Ibid.
[60] Glick, *Powder Burn*, 187.

support a trout fishery, which is a standard of measurement for healthy rivers. Nevertheless, ski resorts continue to flirt with the minimum flow levels year after year.[61]

Snowmaking is also extremely energy intensive, which can cause environmental problems on a much wider scale. Although his book is now dated, in 2002, when Clifford published, the state of Colorado generated 94 percent of its energy from coal-burning plants. According to his calculations, an electricity bill of a million dollars for snowmaking – an amount he contends is not unrealistic – equates to the burning of fourteen million pounds of coal, producing thirty million pounds of carbon dioxide (equal to the amount of annual greenhouse gas emissions from 2,835 passenger vehicles).[62] The sad irony is that ski resorts have been indirectly contributing millions of pounds of carbon dioxide into the atmosphere, thus fueling the climate change that now threatens the industry. Clifford further notes that "in Vermont, four of the state's six largest nitrous-oxide air pollution sources are ski resort diesel generators that make electricity to run snowmaking air compressors and water pumps."[63]

These examples only just scratch the surface. Ski resorts across the country have been involved in bitter water-related disputes. Back when Hal Clifford was writing, he reported that the states of Vermont and New Hampshire, together home to thirty-four ski resorts, had no idea how much water was being used for snowmaking. That was problematic, because ski areas in New England, in order to compete with the infamous Rocky Mountain powder, make snow "more aggressively, and in larger quantities … than anywhere else in the country."[64] And with

[61] Clifford, *Downhill Slide*, 183.
[62] Ibid., 185. Carbon equivalency determined using the EPA's Greenhouse Gas Equivalency Calculator, http://www.epa.gov/cleanenergy/energy-resources/calculator.html.
[63] Clifford, *Downhill Slide*, 184.
[64] Ibid.

climate change becoming an increasingly worrisome threat for the winter sports industry, the reliance on artificial snow will only become greater.

It is unsurprising, then, that Vermont would have been the site of a water-use conflict. In 1990, Sugarbush ski area, located in the Mad River Valley, filed permit applications to expand its snowmaking operations. The proposed expansion would have increased the resort's snowmaking abilities from 70 to 250 acres of coverage and required the construction of a 43 million gallon capacity storage pond. Furthermore, the resort would fuel the increased snowmaking capabilities by annually withdrawing 380 million gallons of water from the Mad River.[65] In late 1991, the resort received the go ahead to proceed and was awarded an Act 250 permit from the District Environmental Commission, which confirms compliance with a number of environmental criteria. During the Act 250 permitting process, Sugarbush also received permission to withdraw more water than specified by the "February median flow" – a standard designed to ensure that no withdraw of water depletes rivers below the average flow rate in the month of February, typically the driest winter month.[66]

Sugarbush also needed a Dam Permit from the Agency of Natural Resources (hereafter, the Agency). This permit would allow Sugarbush to alter the flow of the river. Shortly after the permits applications were approved by the Agency, the Vermont Natural Resources Council (VRNC) appealed the permit approvals to the state Water Resources Board (the Board), arguing that the water flow in the Mad River should never be allowed to drop below the February median flow. Rather than completely reverse the Agency's decision, the Board "imposed different and

[65] Christopher McGrory Klyza, Andrew Savage, and Jonathan Isham, "Local Environmental Groups, the Creation of Social Capital, and Environmental Policy: Evidence from Vermont," *Middlebury College Economics Discussion Paper*, no. 04-07 (2004): 16, accessed June 13, 2013, http://cat2.middlebury.edu/econ/repec/mdl/ancoec/0407.pdf.
[66] John H. Fitzhugh and Daniel P. Dozier, "Finding the Common Good: Sugarbush Water Withdrawal," Mediate.com, accessed June 13, 2013, http://www.mediate.com/articles/dozier.cfm.

more stringent conditions than the Agency had required," which Sugarbush agreed to as they were still allowed to deplete the Mad River below the February median flow rate. The increased stringency was not enough to satisfy the VRNC who, along with two other environmental groups, the Vermont chapter of the Sierra Club and the Vermont chapter of Trout Unlimited, threatened to appeal the Board's ruling to the Vermont Superior Court. Although it was unlikely that the environmental groups' challenge would be upheld in court, Sugarbush stood to be held up by the legal process.

Faced with the prospect of waiting at least a year before court could handle the situation as well as the possibility of losing, the company began publicly intimating that it would have to close, "causing the lay-off, directly or indirectly, of some 3,000 people."[67] Because Sugarbush is a major economic driver in the area, threats of closure made the state nervous, and then Governor Howard Dean entered the fray and brought the disputing parties to negotiation. By discussing the different methods the various groups had used to determine flow rates and re-situating the withdraw locations on both the Mad River and the Clay Brook, another source used by the mountain, both groups were able to come to a consensus, and the February median flow has become an accepted standard for snowmaking and water withdraw.[68]

Wetlands, too, are not immune to ski area-wrought abuse. According to the 2012 Environmental Impact Statement for an expansion at Breckenridge Ski Resort, "Wetlands generally include swamps, marshes, bogs, and similar areas."[69] They provide vital plant and wildlife habitat as well as protection against floods and filtration of toxins from water supplies.[70]

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[67] John H. Fitzhugh and Daniel P. Dozier, "Finding the Common Good."
[68] Ibid.
[69] US Department of Agriculture, *Final Environmental Impact Statement for the Breckenridge Ski Resort Peak 6 Project*, 366.
[70] Gilbert Coleman, *Ski Style*, 197.

However, ski area development activities, such as "tree removal, culvert installation, grading, and changes in runoff regimes may affect the ecological functions of wetland resources."[71] Wetlands are protected under the Clean Water Act, and any proposed impacts require a permit from the US Army Corps of Engineers.[72] Nevertheless, in 1993, Telluride Ski Resort was embroiled in controversy over the destruction of wetlands.

As told by ski historian Annie Gilbert Coleman, "federal investigators accused ski area developers of violating the Clean Water Act when they built an eighteen-hole golf course, a parking lot, roads, ski runs, restaurants, and condominiums at the new Telluride Mountain Village."[73] Over the course of six years, Telluride filled in forty acres of wetlands. The EPA sued and, seeking to speed up the lengthy litigation process and settle, Telluride agreed to pay a fine, restore some of the wetlands on resort property, and construct new wetlands in a neighboring county. Locals protested the offer, saying it was not nearly strict enough, and as a result, the US district judge overseeing the case rejected the resort's offer. The EPA then broadened the suit, accusing Telluride of filling in sixty-two acres of wetlands. [74] The controversy delayed the development project for several years and increased costs by at least $2.5 million, prompting one Telluride executive to quip, "Don't do anything to violate the Clean Water Act. Avoid it at all costs, like you would the IRS."[75]

Finally, we turn to the Snake River, the snowmaking water source for both Keystone Resort and Arapahoe Basin, neighboring resorts located in Summit County, Colorado. Alas, the Snake "is one of the most degraded rivers in the West," partially because of the snowmaking,

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[71] US Department of Agriculture, *Final Environmental Impact Statement for the Breckenridge Ski Resort Peak 6 Project*, 366.
[72] Ibid.
[73] Gilbert Coleman, *Ski Style*, 197.
[74] Ibid. In his book, Hal Clifford claims the resort actually filled in 70 acres.
[75] Gilbert Coleman, *Ski Style*, 197.

and partially because of the history of mining in the area. The Snake is contaminated with heavy metals including copper, lead, cadmium, and manganese that are leaching out of old gold and silver mines. In 2000, federal officials discovered that Keystone was drawing water from a polluted water source and using it to make snow near uncontaminated waters.[76] Once the snow melted in spring, the previously clean water bodies were newly contaminated.[77] Keystone did not admit responsibility for the cross-contamination of the streams, but agreed that the matter should be studied. In the meantime, they applied to double their water withdraws from the Snake River.[78]

During this past 2012/2013 winter season, Keystone and Arapahoe Basin once again found themselves in the spotlight for their usage of the Snake's waters. Persistent drought meant that the river flow was lower than usual, and both ski areas had to limit their snowmaking operations. Early in the winter, Arapahoe Basin had to stop withdrawing water altogether. Writing in the *Summit County Citizens' Voice*, journalist Bob Berwyn reported that Keystone had to slow its snowmaking several times because the Snake River's flow dropped below six cubic feet per second, which is the minimum flow required per state regulations. Keystone can even get special permission from the Forest Service to deplete the river down to two cubic feet per second if skier safety is at risk, although that did not happen this past year. [79] Keystone fared better than Arapahoe Basin because of the contract it has with Denver Water, "the utility company that owns Dillon Reservoir."[80] This reservoir is used to supply water to Denver, but in

[76] Clifford, *Downhill Slide*, 183.
[77] Glick, *Powder Burn*, 224.
[78] Clifford, *Downhill Slide*, 183.
[79] Bob Berwyn, "Colorado: Snowmaking Impacts Snake River flows," *Summit County Citizens' Voice*, November 16, 2012, accessed January 21, 2013, http://summitcountyvoice.com/2012/11/16/colorado-snowmaking-impacts-snake-river-flows.
[80] Caddie Nath, "Water Contracts Protect Summit County Snowmaking Operations During Drought," *Summit Daily News*, January 21, 2013, accessed June 15, 2013, http://www.summitdaily.com/article/20130121/NEWS/130129990.

times of scarcity, Keystone is permitted to draw some water from the tunnel that feeds to the city.

In the West, water use is becoming an increasingly contentious issue. Rain is scarce, and most water comes from springtime snow melt. Concerned about climate change, future ski area water usage, and securing enough water for growing communities, in April 2013, the Forest Service hosted several public forums addressing water rights for public lands in Colorado, California, and Utah. Water rights guarantee the owner the right to divert and utilize the surface water existing on a property.[81] In Colorado, these rights "are considered property that can be sold independently of the land associated with the water."[82] Colorado ski resorts are able to use the surface waters on their properties because of these water rights. Furthermore, they can buy water rights on adjacent, privately owned properties in order to supplement their existing water resources.[83] Nationwide, the Forest Service owns 21 percent of the water rights for ski areas located on its land. With resort operators it shares ownership of four percent, and the remaining 75 percent of water rights is owned outright by the ski areas operating on Forest Service property.[84] Now, the Forest Service wants more oversight in how these waters are being used and is seeking to revise its permits with ski areas to include a water clause. While opponents to this clause call the action a federal water grab, the clause would ensure that all water rights remain attached to the land they are associated with. It might also include a provision for joint ownership. This way, a ski resort operator could not sell its water rights "as a commodity that

[81] Dick Wolfe and Joseph Grantham, *Synopsis of Colorado Water Law* (Denver: Colorado Division of Water Resources, 2011), 2.
[82] Glick, *Powder Burn*, 116.
[83] Ibid.
[84] Jason Blevins, "Forest Service Begins Public Review of Ski Area Water Rights Rules," *Denver Post,* April 18, 2013, accessed June 15, 2013, http://www.denverpost.com/breakingnews/ci_23045851/forest-service-begins-public-review-ski-area-water.

eventually may be worth more than skiing."[85] As Jim Pena, acting deputy chief of the Forest Service, explains in the *Denver Post*,

> Without long-term assurances for water, we feel we could be [putting] the public's interest at risk. The whole idea of sustainability is about preserving resources for future generations. We are seeing more of the ski industry being managed by corporate interests. They are no longer mom-and-pop operations. We have to be prepared for people making different business decisions than what is best for the public.[86]

Energy Use and Emissions

Ski resorts require lots of energy to function smoothly. From running chairlifts, to snowmaking, fueling vehicles, and operating hotels and restaurants, energy use is unavoidable. In 2011, the collective equivalent carbon dioxide emissions of eight resorts participating in an emissions reporting and reduction program was 68,500 metric tons.[87] That is equal to the annual greenhouse gas emissions of 14,271 passenger vehicles. And remember, this number is only for eight ski areas. In 1999, Aspen Skiing Company determined its baseline energy use, which equated to 45,526 tons of equivalent carbon dioxide (CO_2).[88] That year, Aspen alone produced the same amount of greenhouse gas emissions as 9,485 passenger vehicles.[89] In 2003, Aspen's Vice President of Sustainability, Auden Schendler, reported that the ski company, which operates four resorts, had been burning 260,000 gallons of diesel fuel annually. Diesel was used in the snowcats which groomed the slopes, in the public buses, and in the backup generators for

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[85] Blevins, "Forest Service Begins Public Review," (includes an interview with Jim Pena).
[86] Ibid.
[87] National Ski Areas Association, *Sustainable Slopes Annual Report 2012* (Lakewood, CO: National Ski Areas Association, 2012), 25, accessed July 10, 2013, http://www.nsaa.org/media/20860/ssar-12.pdf.
[88] Tetra Tech, "Affected Environment: Environmental Performance Measurement and Reporting," in *Greening Your Ski Area: A Pollution Prevention Handbook* (2002), 3-3, accessed July 8, 2013, http://peakstoprairies.org/p2bande/skigreen/Ch%203%20Measurement.pdf. According to the EPA, equivalent carbon dioxide is "a metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential."
[89] "Greenhouse Gas Equivalencies Calculator," United States Environmental Protection Agency, April 2013, accessed July 8, 2013, http://www.epa.gov/cleanenergy/energy-resources/calculator.html#results. Aspen has since reduced its emissions significantly.

chairlifts. Though necessary for operations, diesel fuel emissions are highly emissive, toxic, and contribute to localized air pollution.[90] Yet, according to Schendler, "the largest component of a ski resort's ecological footprint is its electricity use."[91] In 1999, electricity use accounted for 58 percent of Aspen's total greenhouse gas emissions; the same was true for Arapahoe Basin, although the area is smaller and used less electricity and had fewer emissions overall.[92] Obviously, emissions will vary depending on the source of a ski area's electricity.

Since the early 2000s, energy efficiency campaigns have become de rigueur across the US ski industry. Through implementing lighting retrofits, automated energy management systems, chairlift upgrades, green building design principles, green energy purchasing, and switching to biodiesel, improving snowmaking equipment, and even constructing on-site renewable energy sources, efficiency projects have reduced resort greenhouse gas emissions, as well as saved money and provided sexy marketing material. These are all fabulous achievements, but none addresses the single largest source of indirect ski resort emissions: not electricity, as Schendler argued ten years ago, but tourism in general.

Tourism researcher Stefan Gössling explains that in 1990, the transportation sector, including leisure travel, accounted for roughly 25 percent of global energy use and 22 percent of the carbon dioxide emissions from fossil fuel use. He further notes, "There is some evidence that leisure-related travel accounts for about 50 percent of all travel in the industrialized countries."[93] Of the different modes of transportation, "air travel has the greatest impact on global warming."[94] Globally, air travel makes up 15 percent of all leisure-related travel and is

[90] Schendler, "Applying the Principles," 132.
[91] Ibid., 133.
[92] Tetra Tech, "Affected Environment," 3-5.
[93] Gössling, "Global Environmental Consequences," 288.
[94] Ibid., 298.

responsible for 37 percent of its contribution to global warming.[95] Granted, without an industry-wide, comprehensive transportation survey, it is near impossible to quantify the amount of miles driven and flown to access US ski areas each year. Consider, however, the fact that "more than 97 percent of the energy footprint" of tourism to the Seychelles was due to air travel.[96] Thus, with fifteen to twenty million skiers and snowboarders hitting the slopes each year, it seems reasonable to conclude that ski-related travel must have a discernible impact on climate change.[97]

Concluding a book on climate change and global tourism, Gössling and co-editor Michael Hall remark that "current efforts to make destinations more sustainable through the installation of energy-saving devices or the use of renewable energy sources can only contribute to marginal savings in view of the large amounts of energy used for air travel."[98] Clearly, this is not the fault of the ski industry. People drive and fly every day to diverse locations; transportation is not limited to the ski industry alone. Nevertheless, tourism and climate change are bound together – each affects and is affected by the other. Researchers Scott, de Freitas, and Matzarakis write: "The tourism-recreation sector is highly influenced by climate. . . . At the local scale, climate defines the length and quality of the multi-billion dollar outdoor recreation season. . . . Climate also affects a wide range of environmental resources that are critical to the tourism-recreation sector . . . and affects various facets of tourism-recreation operations."[99] What perplexes Gössling and Hall is that, in spite of this relationship, "there appears to be a low level

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[95] Gössling, "Global Environmental Consequences," 298.
[96] Stefan Gössling and C. Michael Hall, "Conclusion: Wake Up…This is Serious," in *Tourism and Global Environmental Change: Ecological, Social, Economic, and Political Interrelationships*, ed. Stefan Gössling and C. Michael Hall, 305 – 320 (London: Routledge, 2006), 306.
[97] "2013 SIA Snow Sports Fact Sheet," SnowSports Industries America, accessed July 28, 2013, http://www.snowsports.org/Reps/ResearchSurveys/SnowSportsFactSheet.
[98] Gössling and Hall, "Conclusion," 306.
[99] Daniel Scott, Chris de Freitas, and Andreas Matzarakis, "Adaptation in the Tourism and Recreation Sector," in *Biometeorology for Adaptation to Climate Variability and Change*, ed. Kristie L. Ebi, Ian Burton, and Glenn McGregor, 171 – 194 (Houten, Netherlands: Springer Science + Business Media B.V., 2009), 172.

of support for measures that are aimed at reducing emissions of GHGs [greenhouse gases]. This is, for the industry as a whole, highly irrational from an environmental point of view."[100] To an extent, this is true for the US ski industry, too, as we shall soon see.

Habitat Fragmentation and Loss

All development will entail some degree of habitat alteration, even if on a micro scale. With larger development projects, such as ski resorts, two types of habitat degradation are noted concerns: fragmentation and perforation. Defined in the White River National Forest's Environmental Impact Statement, fragmentation is "the breaking up of contiguous blocks of habitat into progressively smaller patches that are increasingly isolated from one another. It also may be viewed as the process of interspersing blocks of suitable habitat with areas that are hostile to plant or animal life, such as highways or urban development."[101] Perforation, on the other hand, occurs when there are holes within intact tracts of habitat.[102] In either case, the range and mode of transportation for each species determine how it will be affected. For example, a highway cutting across a particular habitat would act as a barrier to ambulatory animals, but would not so gravely affect local bird populations which could just fly over the new road. Plant species might suffer from slowed migration across the disturbed area or experience genetic isolation. Fragmentation can also make it difficult for pollinators to visit dispersed plant populations.[103]

In the White River National Forest, the areas with the most significant habitat fragmentation are those with heavy ski area development, especially in the very popular Summit,

[100] Gössling and Hall, "Conclusion," 310.
[101] US Department of Agriculture, "Affected Environment," 3-85.
[102] Ibid., 3-86.
[103] Ibid., 3-85.

Pitkin, and Eagle Counties (home to Breckenridge, Keystone, Arapahoe Basin, Copper Mountain, Vail Mountain, Beaver Creek, and the Aspen/Snowmass resorts).[104] Ski area development has lasting effects upon local environments. Tree harvesting for constructing trails, chair lifts, buildings, roads, or for burying utility lines turns once forested lands into permanent grasslands, impacting the wildlife living in these areas.[105] This land conversion "generally reduces the quality and effectiveness of wildlife habitat for species that require or prefer interior forests or forest travelways."[106] It also decreases the availability of habitat for species that live in or underneath the snowpack, which, if not deep enough, can be compacted by skiers and especially by grooming equipment. Reducing acceptable habitat for smaller species might impact the viability of larger mammal species by increasing competition for food. And again, ski area development can pollute and/or deplete waterways, thus degrading habitat for aquatic species and increasing the potential of chemical biomagnification for any species that relies on a polluted waterway for sustenance. Furthermore, ski area development can also present barriers to animal migration by "eliminating or restricting access between connected wildlife habitats."[107] Presently, only 45 percent of the land allotted for ski area development within White River National Forest has been used. However, the current Forest Plan designates an additional 8,600 acres for ski area expansion, which means there is the potential for further "localized fragmentation or perforation."[108]

Habitat disturbance is an on-going problem. As more ski resorts diversify to become recreation destinations for all seasons and as development proceeds apace, human intrusion into

[104] US Department of Agriculture, "Affected Environment," 3-94.
[105] Ibid., 3-88.
[106] Ibid., 3-251.
[107] Ibid., 3-251.
[108] Ibid., 3-91. The chosen plan, known as Alternative K, is moderate compared to Alternative B, which set aside an additional 50,000 acres for expansion. However, the Forest Service only expects about half of the allotted acreage to be developed.

wildlife habitat increases. Subsequently both the quantity and quality of habitat suffer. There are two iconic examples of the negative impacts of ski area expansion on wildlife. Each of these anecdotes takes place in the Vail Valley, where, as Clifford narrates, "the mule deer and the elk, the sage grouse and jackrabbits, Canada lynx and boreal toads – are disappearing, falling back before the relentless development that is rooted in the ski industry."[109] Here, we shall first discuss the case of the Beaver Creek elk herd, and second, the infamous lynx of Vail Mountain.

The availability of suitable habitat is a major issue for the elk population residing in the White River National Forest, especially during the summer calving season and during the winter. Forest Service officials are aware that resource conflicts between recreationists and elk can have dramatic consequences for the ungulates.[110] Yet unfortunately, prime elk habitat is increasingly encroached upon by ski area development. Elk spend their summers in high altitude boreal forests. In Colorado, much of this land is designated wilderness, so there is no risk of development. However, they head downhill during the winter, seeking enough food to last until spring, good cover for over-wintering, and less snow for easy mobility. It is during the winter when the elk face their most formidable foe: humans. The elks' preferred wintering habitat overlaps with the areas humans develop for their winter habitat: "valley floors, low hills with south-facing slopes, [and] river bottoms."[111]

Before Beaver Creek was Beaver Creek, before the existence of the resort and all the development associated with it – and especially before the droves of human intruders – the area was the wintertime home to several hundred elk who bedded down on slopes that would one day be clear-cut for skiing. In 1974, six years before the new resort opened, Jack Grieb, at that time

[109] Clifford, *Downhill Slide*, 161 – 162.
[110] US Department of Agriculture, "Affected Environment," 3-116.
[111] Clifford, *Downhill Slide*, 163.

the Director of the Colorado Division of Wildlife, predicted that construction of Beaver Creek "will all but eliminate the elk herd which winters here."[112] Despite his warnings, development of Beaver Creek went forward, though not without NEPA-related delays. Colorado state officials, Jack Grieb among them, argued that "the Forest Service had violated NEPA in preparing its EIS by ignoring the proposed ski resort's impact on local wildlife and water resources. . . . The state's primary criticism of the Beaver Creek EIS was its failure to address the impacts of the new ski resort on the area's wildlife, notably its sizable elk herd."[113]

Once the resort finally opened in 1980, the elk, crowded out by the human development, relocated to a nearby, undeveloped parcel of land west of Beaver Creek, known as Bachelor Gulch. Presumably, life was good for them until the 1990s, when Vail Resorts, the owner of Beaver Creek, purchased a small ski area called Arrowhead. Arrowhead also lay west of Beaver Creek, with Bachelor Gulch sandwiched between. When Vail Resorts connected the two ski areas, "the undeveloped pocket of Bachelor Gulch was filled with lifts and luxury homes, to the detriment of the resident elk."[114] Then, the elk had no human-free places left to go. As Bill Heicher, a Colorado Division of Wildlife field officer, told Hal Clifford, "There's no place for those suckers to go. There's nothing left for them."[115]

Local hunters voiced concern about the loss of elk habitat as well. In 1998, Vail Mountain was about to embark upon its highly controversial Category III expansion, which would open key elk calving territory to development. Speaking at the time, Vail local and hunter Dave Altman expressed his concern over the future of the elk herd. The elks' winter habitat was quickly being replaced by golf courses and multi-million dollar homes, and soon their calving

[112] Jack Grieb, letter to Wil Ulman, November 13, 1974, quoted in Childers, *Colorado Powder Keg*, 95.
[113] Childers, *Colorado Powder Keg*, 107
[114] Clifford, *Downhill Slide*, 163 – 164.
[115] Ibid. (includes interview with Bill Heicher), 164.

grounds would be compromised, too. Speaking to Daniel Glick, he wondered, "We take away their wintering grounds. . . . Now we take away where they give birth. What the hell are we doing to them?"[116] He was right to worry. Starting in 1988, a group of wildlife biologists began monitoring elk activity in relation to ski area development. They examined usage patterns before and after two major expansions at both Vail Mountain and Beaver Creek. During the study period, Vail began development of its back bowls which added 1,902 acres of new skiable terrain to the mountain, and Beaver Creek constructed a lodge and a picnic area. Publishing the results of their study in 1995, the authors found that overall elk activity at Vail decreased to a mere 30 percent of what it had been prior to the development of the back bowls.[117] By 1992, activity levels had rebounded to 76 percent on average. While encouraging, the researchers cautioned that "this increase in elk use may level off and never approach pre-development conditions."[118] And, in fact, the Colorado Division of Wildlife found fault with the characterization of the elk return and argued instead that elk activity had remained below 50 percent of what it had been prior to the expansion. The Division of Wildlife even went so far as to suggest alternative proposals for the development of the Category III area, all incorporating less development and therefore less intrusion into valuable habitat. The Forest Service ignored these suggestions.[119]

In his position with the Colorado Division of Wildlife, Bill Heicher was responsible for submitting proposals to local government officials or land managers for mitigating the impacts of development on wildlife, although his suggestions were not legally binding. According to him, the Beaver Creek elk herd had been the subject of three separate mitigation projects. "In each case, the developers set aside land for the elk, then came back later with a reason why they

[116] Glick, *Powder Burn* (includes an interview with Dave Altman), 21 .
[117] James Morrison et al., "The Effects of Ski Area Expansion on Elk," *Wildlife Society Bulletin* 23, no. 3 (Autumn 1995): 481.
[118] Ibid., 487.
[119] Childers, *Colorado Powder Keg*, 142.

needed to develop that land, and explained how the elk could go somewhere else."[120] This strategy worked, until there was absolutely no place left for the elk to go.

The situation became so desperate for the hungry elk that they resorted to desperate measures. One winter during the late 1990s, finding themselves crowded out of their winter habitat, several hundred elk attempted to cross Interstate 70, *the* major east-west thoroughfare in Colorado. Putting themselves and drivers in great danger, they repeated this treacherous crossing in successive winters, prompting "the Colorado State Patrol . . . to close the highway for several hours to allow the elk the cross."[121] On the other side of the valley, the elk were once again on national forest property. However, they were now entering into mule deer territory. The deer could not compete with the elk for food and began their own migration in search of places to forage in peace. Sadly, "both deer and elk lost in this conflict between wildlife and development, often leading herds to stand starving alongside the interstate during the long winter months due to a lack of adequate habitat."[122] In an attempt to ameliorate the situation, the Colorado Department of Transportation proposed in 2008 to build a wildlife bridge over the interstate for animals to safely cross.[123] The bridge does not yet exist, although Colorado Department of Transportation is collaborating with the Federal Highway Administration, Rocky Mountain Wild, and other partner groups to scout suitable locations for the project.[124]

Home not only to the elk, the Vail Valley also has some of the best lynx habitat in the state of Colorado. The lynx is perhaps the most notorious example of the negative impacts ski

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[120] Clifford, *Downhill Slide,* 164.
[121] Ibid.
[122] Childers, *Colorado Powder Keg*, 140.
[123] Ibid., 141.
[124] Colorado Department of Transportation, "Wildlife on the Move!" *Colorado Department of Transportation News Releases 2011*, October 17, 2011, accessed June 18, 2013, http://www.coloradodot.info/news/2011news/10-2011/wildlife-on-the-move.

area development has upon the environment, owing to the actions of a small group of ardent environmentalists taking unprecedented action against an approved expansion at Vail Mountain. Their protest ignited controversy over the political pull of ski resort owners, and how much development is acceptable and at what cost.

Historically, "ski area development undoubtedly has had . . . impacts on lynx habitat through the modification of preferred denning, foraging and dispersal habitat, and increased disturbance."[125] In addition to habitat alteration, ski area operations compact snow, increasing competition for prey with bobcats, coyotes, and other predators since the lynx can no longer enjoy its competitive advantage of being able to walk across uncompressed snowfall.[126] Furthermore, though lynx have been found to be relatively undisturbed by human activity, "some activities may be significant at certain times of the year so that lynx use of habitat may be limited, especially at and near denning habitat."[127] Presently, there are roughly 1,456,000 acres of lynx habitat within the White River National Forest boundary. While activities such as prescribed burns, wildfire, livestock grazing, timber management, and ski area development have all negatively impacted the quality and quantity of available habitat in the forest, Forest Service officials also note that only five percent of the available habitat may be considered unsuitable.[128]

Vail's 4,100-acre Category III expansion area was not just suitable lynx habitat, it was considered to have some of the very best remaining lynx habitat in Colorado. The expanse was "smack in the middle of an unroaded area that was, in biological principle, perfect for a cat who

[125] US Department of Agriculture, "Affected Environment," 140.
[126] Bill Ruediger, et al., *Canada Lynx Conservation Assessment and Strategy*, Forest Service Publication #R1-00-53 (Missoula, MT: United States Forest Service, 2000), 7-8.
[127] US Department of Agriculture, "Affected Environment," 138.
[128] Ibid., 137.

required a huge home range."[129] Unfortunately for Vail Associates (now known as Vail Resorts), Vail Mountain's owner, in 1998 the US Fish and Wildlife Service planned to include the lynx as a threatened species protected under the Endangered Species Act. This designation "held the potential to cause serious problems for the Category-III ski-area expansion."[130] If the Fish and Wildlife Service determined that the cat was indeed threatened, "the federal government would begin working to increase lynx populations to a stable and self-sustaining level," and Vail would find its own development plans threatened by political pressure to scrap the project. [131]

Up until that time, the last recorded lynx sighting around Vail was in 1973 when a trapper captured and killed a lynx he had spotted from a chairlift on Vail Mountain. In the years since, there was a lack of consensus on whether or not the Vail area lynx had moved on – either geographically or metaphysically. Years of trapping, relentless development, and predator extermination programs had decimated Colorado's lynx population.[132] Indeed, the species once roamed across twenty-one states throughout the Northwest, Rocky Mountains, Great Lakes, and into New England. In the early 2000s, small populations were found in only four states: Washington, Montana, Colorado, and Maine.[133] According to Hal Clifford, only the populations in Washington and Montana are viable.[134] It is little wonder, then, that the Fish and Wildlife Service would be concerned about the future of this species.

Nevertheless, in 1989, biologists believed that the cats did indeed live within the boundaries of Vail as well as in the surrounding mountains. A decade later, many biologists

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[129] Glick, *Powder Burn*, 5.
[130] Clifford, *Downhill Slide*, 170.
[131] Ibid.
[132] Glick, *Powder Burn*, 6 – 7.
[133] Ibid., 5.
[134] Clifford, *Downhill Slide*, 170.

continued to assert that lynx were still present.[135] Yet definitive evidence was hard to come by. Clifford reports that there had been "occasional sightings of possible lynx tracks."[136] And Childers writes that "no confirmed sightings of the enigmatic predator had occurred in more than three decades since the Forest Service signed off on the Category III expansion."[137] But, on assignment for *Outside Magazine* in January 1999, journalist Robert Boynton spent time with Robert Alsobrook, an amateur naturalist from Boulder familiar with the Vail area. Alsobrook took Boynton out to the Category III backcountry and recounted his own lynx story: Two years earlier Alsobrook had been tracking lynx in the Vail area. He never saw one, but did come across a set of fresh prints, "which the US Fish and Wildlife Service verified as belonging to the lynx."[138] As he explained to Boynton, "the charge that the Canadian lynx hasn't been seen in Category III for 30 years is being used by VA [Vail Associates] to mislead people into believing there isn't any evidence of its existence."[139]

This was the crux of the controversy. Key to the resolution of the Vail vs. lynx conflict was whether or not any lynx still existed in the area. A Vail Associates spokesperson, Porter Wharton III, "argued that environmentalists, in an effort to raise money for their organizations, had manufactured the lynx issue as a desperate ploy to harass the ski company and to exploit Vail's notoriety."[140] Vail claimed that no lynx were left in the area, despite the fact that its trail maps at the time requested that skiers and snowboarders remain inbounds so as not to disturb "potential lynx habitat."[141] They also issued a press release in 1989 announcing the fact that a

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[135] Clifford, *Downhill Slide*, 170; Glick, *Powder Burn*, 161.
[136] Glick, *Powder Burn*, 5.
[137] Childers, *Colorado Powder Keg*, 139.
[138] Robert S. Boynton, "Powder Burn: Eco-Terrorism at Vail," *Outside Magazine*, January 1999, accessed June 19, 2013, http://www.outsideonline.com/adventure-travel/Powder-Burn.html?page=1.
[139] Ibid.
[140] Glick, *Powder Burn*, 6.
[141] Ibid. In the 2012/2013 season, the maps just said, "Wildlife habitat. No access."

lynx had been found on Vail Mountain.[142] If no presence of the lynx could be found, and the lynx was determined to be extinct in the area, the Fish and Wildlife Service's regulatory hands would be tied – it would be unable to do anything.[143] However, if indeed there was evidence of lynx activity near Vail, and if the Fish and Wildlife Service biologists found that the expansion would "jeopardize lynx survival or recovery efforts," then the project would have to be modified or, if the Forest Service then denied approval, given up completely.[144]

Knowing that the US Fish and Wildlife Service intended to list the lynx as a threatened species under the Endangered Species Act, and also knowing that the lynx was already listed as endangered within Colorado by the state's Division of Wildlife, Vail and the US Forest Service organized a conference with the US Fish and Wildlife Service biologists who would be studying and formally commenting on the Environmental Impact Statement prepared for the project. Both Vail and the Forest Service wanted to see the expansion through to completion, and they hoped to work with the Fish and Wildlife Service "to create a development and mitigation plan that would treat the lynx as a threatened species but would still allow the development to proceed."[145] In order to achieve this outcome, the Fish and Wildlife biologists would have to issue a "no jeopardy" finding, meaning that the Category III expansion would neither jeopardize lynx survival nor recovery and that the project would be free from having to comply with potential Endangered Species Act regulations.[146]

As it turns out, Vail got just what it wanted, though not without a little political wrangling. In the conference report, the Fish and Wildlife Service field biologists did in fact

[142] Glick, *Powder Burn*, 6.
[143] Ibid., 161.
[144] Clifford, *Downhill Slide*, 171.
[145] Ibid.
[146] Ibid.

determine that the Category III expansion would jeopardize both existing lynx populations and the ability to recover new populations in the area. But, in the conclusion of the very same document, the language changes. Although the scientists reiterated the fact that the expansion was "likely to adversely affect the lynx, and may contribute to the ultimate extirpation and diminish the potential recovery of the lynx" in the area, they had ultimately concluded that the project would not harm the survival of lynx living in the contiguous United States.[147] What happened? Undermining the opinion of its field biologists, the US Fish and Wildlife Service officials in Washington, DC emailed the associate regional director in Colorado to ensure that a "no-jeopardy" ruling would be issued. In the end, the Fish and Wildlife Service decided that "the project did not jeopardize the lynx as a species, and so a no-jeopardy decision was appropriate."[148]After facing down Endangered Species Act threats, several lawsuits, protests from local environmental groups, and following years of scientific study, Vail's "most environmentally sensitive expansion of a ski area in the history of the ski industry" could proceed apace.[149] Facing defeat, Kevin Knapmiller, a local Sierra Club member, remarked to *Outside Magazine*, "I guess all we can do is hope that the skiing will be good."[150]

And then all hell broke loose. On October 18, 1998, just days before the construction was scheduled to begin, members of the eco-terrorist group Earth Liberation Front (ELF) set fire to three chairlifts, the Ski Patrol Headquarters building, a small snack stand, and the Two Elk lodge, a 33,000 square-foot restaurant filled with "more than one million dollars' worth of Native American buffalo- and elk-skin robes, blankets, murals, and Old West memorabilia."[151] A few

[147] US Fish and Wildlife Service Conference Opinion, Vail Ski Area Category III Expansion, March 16, 1999, 9, quoted in Clifford, *Downhill Slide*, 174.
[148] Clifford, *Downhill Slide*, 175.
[149] Glick, *Powder Burn* (includes interview with former Vail Associates CEO Adam Aron), 61.
[150] Boynton, "Powder Burn" (includes interview with Kevin Knappmiller).
[151] Glick, *Powder Burn*, 31.

days after the incident, in a press release distributed by a spokesperson, ELF took credit for the arson:

> On behalf of the lynx, five buildings and four ski lifts at Vail were reduced to ashes on the night of Sunday, October 18th. Vail, Inc. is already the largest ski operation in North America and now wants to expand it even further. The 12 miles of roads and 885 acres of clearcuts will ruin the last, best lynx habitat in the state. Putting profits ahead of Colorado's wildlife will not be tolerated. This action is just a warning. We will be back if this greedy corporation continues to trespass into wild and unroaded areas. For your safety and convenience, we strongly advice skiers to choose other destinations until Vail cancels its inexcusable plans for expansion.[152]

Once the fire trucks finally wove their way up the mountaintop to the site of the fires, there was nothing they could do; everything had burnt to a crisp. In the end, though, things did not turn out so badly for Vail. The fires put a temporary end to all of the anti-Vail sentiment that was seething in the Valley. The resort collected insurance money and rebuilt everything: two new lifts, a new Patrol Headquarters, a new snack bar, and an even bigger Two Elk Lodge. The expansion, officially called Blue Sky Basin, even opened on time in January 2000.[153]

Hoping to put a positive spin on the entire situation, Vail begun funding lynx recovery programs in the state. Unfortunately, many of the lynx initially captured in Canada for release in Colorado's San Juan Mountains starved to death. A few were struck by cars, one of which was killed on I-70 near Vail.[154] Another was illegally shot by a hunter from Louisiana.[155] Facing criticism that it had failed to adequately study the suitability of the release area, the Colorado Division of Wildlife revised its lynx management plan, and these days, the lynx are doing relatively well in Colorado. In fact, "by 2006 there were 255 Canada lynx reported in the

[152] Earth Liberation Front, e-mail message, October 19, 1998, quoted in Glick, *Powder Burn*, 3.
[153] Glick, *Powder Burn*, 244.
[154] Ibid., 238.
[155] Clifford, *Downhill Slide*, 161.

state."[156] In March 2000, the lynx was listed as a threatened species under the Endangered Species Act. This meant that all federal agencies needed to develop programs for the conservation of the lynx (or any listed species), as well as insure "that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of critical habitat."[157]

The Forest Service is now obligated to study how ski area expansions will affect lynx populations, including impacts on their habitat and activity patterns.[158] For this reason, Breckenridge Ski Resort recently came under fire for its approved Peak 6 expansion. The environmental group Rocky Mountain Wild threatened to sue Breckenridge because it claimed the Peck 6 project would damage lynx habitat. The organization dropped the suit when Vail Resorts, the owner of Breckenridge, pledged to donate $425,000 to a fund for lynx conservation in Summit County, where Breckenridge is located. The resort also agreed not to expand further north, and to limit the construction of future restaurants on Peak 6 to below the tree line.[159]

The Vail arsons are an iconic example of the tensions that exist between ski resorts and their surrounding environments, but Vail is hardly the only resort where such conflicts can be found. Real estate development and a new golf course crowded out elk and moose populations in Snowbasin, Utah, forcing them to migrate in search of unadulterated habitat. The trouble is, wherever they go, there are other elk and moose that also need adequate food and shelter.[160] The

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[156] Childers, *Colorado Powder Keg*, 153.
[157] Ruediger, et al., *Canada Lynx Conservation*, Introduction-1.
[158] Ibid., 7-8.
[159] Breeana Laughlin, "Vail Resorts, Enviro Group Compromise on Breckenridge Lynx Habitat," *Denver Post*, June 2, 2013, accessed June 20, 2013, http://www.denverpost.com/news/ci_23370760/vail-resorts-enviro-group-compromise-breckenridge-lynx-habitat.
[160] Clifford, *Downhill Slide*, 167.

newcomers increase competition for food, and survival becomes increasingly difficult. In Whitefish, Montana, an 840-acre golf complex chased grizzly bears out of their homes and into the center of town.[161] Wildlife are increasingly crowded out – "mitigated" to other locales – in order to satisfy an unquenchable thirst for bigger ski resorts and more real estate development. Resort operators may claim that any impacts on wildlife are not their fault, but Hal Clifford disagrees, writing, "It is a disingenuous argument. Although the resort development may not directly kill much wildlife, it is the identifiable and undeniable beginning of a chain of development events, and so it is indirectly responsible for much of what follows."[162]

Development

Ski resorts are drivers of growth. As the ski industry matured and small ski areas either got big or got out (to echo an old agricultural refrain), ski towns transformed into resort towns with local economies fueled by skier money spent on lift tickets, lodging, restaurants, real estate, clothing, equipment, and kitschy souvenirs. By making these communities more attractive for tourism, they were also made more attractive for new residents. In Colorado, growth has been dramatic along the I-70 corridor, which, when opened, not only linked eastern and western Colorado, but also increased access to ski resorts nestled in formerly tucked away hamlets. Thus, counties such as Eagle (home to Vail and Beaver Creek) and Summit (home to Keystone, Breckenridge, Copper, and Arapahoe Basin), each bisected by I-70, have grown considerably over the past few decades, with population increases far outpacing national rates of change. In 1990, Eagle County's population was 21,928. By 2000, it had exploded by 90 percent to 41,659 residents. As of the latest 2010 census, there were 51,874 people living in Eagle County. In

[161] Clifford, *Downhill Slide*, 167.
[162] Ibid., 166.

Summit County, the population increased by 83 percent between 1990 and 2000, from 12,881 to 23,548 residents. Growth slowed after 2000, and the population only increased by 19 percent to 27,994 inhabitants in 2010.[163] According to estimates, both counties will continue to grow in the coming decades.[164]

The influence of recreation on population growth is evident when considering the economies of these localities. According to a 2001 Colorado State University Extension report, tourism was responsible for 38 percent of Summit County's total income in 1997. Skiing alone accounted for 25 percent of the total. Furthermore, over 37 percent of the county's jobs were related to ski tourism.[165] In these areas, ski resorts are major economic forces, and as they grow and expand, so do the communities around them – permanently and temporarily. The town of Breckenridge, located in Summit County, has a permanent population of roughly 3,400 people, but during peak ski season, the town houses over 36,000 residents, tourists, and seasonal workers.[166]

The United Nations Environmental Programme reports that tourism "can put enormous pressure on an area and lead to impacts such as soil erosion, increased pollution, discharges into the sea, natural habitat loss, increased pressure on endangered species, and heightened vulnerability to forest fires."[167] If this list of ecological ills sounds familiar, it should. The environmental impacts of ski areas are not exclusive to the snowy mountains in which they lie.

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[163] All data from the US Census Bureau, http://www.census.gov.
[164] "Population Projections," Summit County, Colorado, accessed June 22, 2013, http://www.co.summit.co.us/index.aspx?NID=519.
[165] Rebecca Goldsmith, Andrew Seidl, and Stephan Weiler, *Ski-Tourism and the Economy of Summit County, Colorado*, *Colorado State University Extension Agricultural and Resource Policy Report* 4 (2001): 1.
[166] "Living in Breckenridge," Town of Breckenridge, accessed June 21, 2013, http://www.townofbreckenridge.com/index.aspx?page=368.
[167] "Tourism's Three Main Impacts," United Nations Environment Programme, accessed June 22, 2013, http://www.unep.org/resourceefficiency/Business/SectoralActivities/Tourism/FactsandFiguresaboutTourism/ImpactsofTourism/EnvironmentalImpacts/TourismsThreeMainImpactAreas/tabid/78776/Default.aspx.

Skiing has become yet another form of mass tourism, and the consequences of resort operations in Colorado's high country are similar to the impacts of tourism development around the world. Moreover, the preceding environmental impacts are all united by one insidious commonality: they are each exacerbated by development. Martha Honey, ecotourism researcher and co-founder and co-director of the Center for Responsible Tourism, emphasizes that while tourism was once considered a "smokeless" (or nonpolluting) industry, it often ushered in overdevelopment and, consequentially, environmental degradation.[168] The evolution of the ski industry from mom and pop ski slopes with one rope-tow to sprawling resorts with thousands of skiable acres and just as many thousands of beds has brought with it a host of environmental problems. Indeed, real estate development both on and off the ski slopes has become a major source of profit for ski companies, but it is also a primary source of the ecological damage ski areas wreak upon the natural environment.

Speaking about the relationship between ski areas and development, Ted Zukoski, an attorney formerly with the Boulder, Colorado-based Land and Water Fund (now Western Resource Advocates), remarked, "Ski area expansions cause development. It increases infrastructure needs, affects air quality, and increases traffic. Period. No matter what they say."[169] Resort owners, ever attuned to opportunities for greater profits, realized that there was great economic potential in selling real estate constructed on private lands adjacent to the ski slopes. Fittingly, "By the middle of the 1980s, it seemed every ski resort in the country was either planning or in the process of building a base village complete with condominiums,

[168] Martha Honey, *Ecotourism and Sustainable Development: Who Owns Paradise?* 2nd ed. (Washington DC: Island Press, 2008), 10.
[169] Glick, *Powder Burn* (includes interview with Ted Zukoski), 163.

restaurants, and retail space in order to bolster profits."[170] Real estate profits were invested in on-mountain improvement projects, from high-speed chair lifts to expanded and better snow-making capabilities, larger and more luxurious on-mountain restaurants, and summertime attractions.[171] In 1998, *The Economist* dubbed the evolution of ski areas into four season theme-parks "the 'Disneyfication' of the winter sports industry."[172] These improvements attracted skiers in droves, which kicked off an arms race between different ski areas and led to a steady consolidation of the ski industry. Those areas that could not keep up were either incorporated into existing resorts or went out of business. Whereas in the beginning of the 1990s there were 735 ski resorts in the United States, by the end of the century that number had shrunk to 509.[173] Once the dust had settled, just three companies (the so-called "Big Three," American Skiing, Intrawest, and Vail Resorts) owned 80 percent of Colorado's ski areas, the largest ski market in the United States.

Critics of the industry argue that in the quest to build more, own more, and sell more, resort owners transitioned from only selling skiing to selling skiing and investing in on-mountain improvements as a way to sell more real estate.[174] Vail local and journalist Allen Best quips that "skiing these days is hardly just about skiing; it's about consuming."[175] Best is on to something. Consider that in the mid-1970s, lift tickets "represented almost 80 percent of revenues for the average ski area in the USA."[176] In the 2002/2003 winter season, however, the share of revenue earned through lift tickets dropped to 54 percent. Concurrently, spending on food, ski and

[170] Childers, *Colorado Powder Keg*, 124.
[171] Ibid.
[172] Scott, "US Ski Industry Adaptation," 274.
[173] Childers, *Colorado Powder Keg*, 124.
[174] Clifford, *Downhill Slide*, 8.
[175] Allen Best, "Vail and the Road to a Recreational Empire," *High Country News*, December 9, 1998, accessed June 24, 2013, http://www.hcn.org/issues/144/4646/.
[176] Scott, "US Ski Industry Adaptation," 274.

snowboarding lessons, lodging, retail, and real estate increased significantly, accounting for over half of industry revenues.[177] Revealingly, Clifford quotes a former CEO of Intrawest, who said, "We don't consider ourselves in the ski business."[178] Vail Resorts currently operates seven ski resorts in Colorado and California, recently acquired a fifty-year lease for the Canyons ski resort in Utah, and owns luxury hotels across the West and in the Caribbean. The company advertises itself not as a skiing company but as a company with three highly integrated components: mountain, lodging, and real estate. Aspen Skiing Company does not do real estate development, although the town itself has suffered from enough development that the term "Aspenization" was coined to describe "all that was wrong with resort communities – rampant growth, mass commercialism, environmental degradation, and a loss of character."[179] Nevertheless, former Aspen Skiing Company CEO Pat O'Donnell, asserts that real estate development is "strip mining the scenery. There's a developer mentality where the ski area is seen as a commodity, part of a portfolio."[180] This is a mentality that has earned the Big-Three companies many enemies.

What does this mean for the environment? For most in the ski business, profit trumps planet. Speaking about proposed plans for expansion at Mammoth Mountain, California, one Mammoth local sounded off against Intrawest, the former operator of the ski area: "They answer to their stockholders and Wall Street. They do not answer to the town of Mammoth Lakes or the town of Keystone, or the town of Stratton, Vermont, or any of these other places where they are. They are purely driven by dollars. They bulldoze everything out of the way."[181] More than once, resort owners have run afoul of environmentalists, locals, and the government for development double-speak. In 1998, Vail Resorts applied to develop 165 acres of new intermediate ski terrain

[177] Rivera and de Leon, "Is Greener Whiter?" 419.
[178] Clifford, *Downhill Slide* (includes interview with Joe Houssian), 45.
[179] Ibid, 99.
[180] Glick, *Powder Burn*, 205.
[181] Clifford, *Downhill Slide*, 82 – 83. Intrawest is no longer a publicly traded company.

and, to service the new trails, to construct a new chair lift on Peak 7 at Breckenridge Ski Resort. Vail insisted that it had no plans whatsoever for the 283 acres of land it owned at the base of Peak 7, and requested that the Forest Service assess the project based on the expansion and new lift alone. Clifford writes, "Environmentalists cried foul, claiming the Forest Service was blind to the obvious."[182] The obvious is that Vail looked awfully suspicious expanding to Peak 7 meanwhile denying any plans for developing the land it owned at the base of the mountain precisely where the bottom chair lift terminal would be. The Forest Service claimed it could not evaluate the project based on speculation. It would evaluate the project based on the merits of the proposals delivered and nothing more. Vail even had its attorney send a letter to the US Army Corps of Engineers, also involved in reviewing the proposal, in which he emphasized that there was "no possible link between any on-mountain expansion and base-area development on and just above the VRDC [Vail Resort Development Company] lands at the base of Peak 7, known as Cucumber Gulch."[183] The environmental groups were unconvinced, and the Land and Water Fund sued the Forest Service, urging the agency to consider potential future development along with the rest of the proposal.

The lawsuit accomplished nothing, but eventually the EPA's Denver office caught wind of the controversy and got involved. The EPA was concerned because part of Cucumber Gulch contained wetlands. Summit County had lost twenty-four hundred acres of wetlands since 1962, "almost all of it directly or indirectly related to skiing or the construction of the Dillon Reservoir."[184] With only thirteen hundred acres remaining in the county, the EPA was not inclined to be sympathetic towards any project that would degrade wetland areas, especially

[182] Clifford, *Downhill Slide*, 131.
[183] Ibid.
[184] Ibid.

wetlands that it had determined were "nonrenewable and irreplaceable."[185] Unlike the Forest Service and the Army Corps of Engineers, the EPA felt strongly that approving the Peak 7 expansion proposal would be playing into Vail's hands and that any village development would necessarily damage the Cucumber Gulch wetlands. Warning the Army Corps of Engineers that the project might violate the Clean Water Act and that it was pursuing the matter within higher administrative levels, the EPA successfully pressured the Corps of Engineers to act. The Corps informed Vail that before it would approve the project, Vail must show how it planned to develop Cucumber Gulch. "Suddenly," writes Clifford, "in mid-February 1999, VRDC opened an 'Information Center' in downtown Breckenridge, featuring careful drawings of the new villages planned for the bases of Peak 7 and 8."[186] Vail engaged in conscious subterfuge, and in so doing, had successfully duped both the Forest Service and the Army Corps of Engineers. It wanted new base villages, wetlands and environmental impacts be damned. In the end, however, Vail had to coordinate with the town of Breckenridge and Summit County, and the scale of the project was diminished. Peak 7 was opened up to skiing, and the new lift was constructed. But to this day, there are no mountain villages at the bases of Peak 7 and Peak 8 – just a few new lodges. The town of Breckenridge has since designated its acreage in Cucumber Gulch a Wildlife Preserve.

The evidence that ski resorts spur development is everywhere. In his article on the metastatic growth in Colorado's ski country, Allen Best explains that Vail's lynx controversy was not so much about the lynx itself. Rather, the animal was symbolic of the "broader worries about the impacts of development on the natural world."[187] All along the I-70 corridor, once rural

[185] Clifford, *Downhill Slide*, 132.
[186] Ibid., 134.
[187] Best, "Vail and the Road to a Recreational Empire."

valleys are now teeming with palatial homes, multi-story condominiums, and businesses. Second homes, either single family, condos, or townhouses, comprise as many as half of the residences in some towns, inflating real estate prices and pushing out locals who cannot afford the higher cost of housing.[188] Traffic congestion has become a common annoyance during peak season, and air pollution is now an issue, too, because "resort towns produce larger amounts of particulate emissions than mountain landscapes can handle."[189] This rapid development has led small communities to experience symptoms of urbanization typical of much larger municipalities.[190]

Perhaps unsurprisingly, the Forest Service explains that often "the most significant effects of fragmentation and perforation have occurred on the private lands adjacent to the forest."[191] As ski areas draw more and more people to mountain communities, spurring rapid development, public and private lands are increasingly razed, built upon, paved over and driven upon, and the cycle of environmental damage is perpetuated. Thus, with ski resorts both directly and indirectly causing real and significant impacts upon the very nature they sell, the question many people are posing is: When is enough, enough? And who decides? In a moment of uncharacteristic honesty regarding resorts and development, a spokesperson for the New York investment firm that owns Vail Resorts acknowledged that these questions are "the heart of it."[192]

Is it necessary for resorts to expand in order to meet the public demand? That is the argument resort operators make. Yet this assertion crumbles when analyzing visitor numbers

[188] The socio-economic impacts of the ski industry – from the outrageous costs of real estate to low wages paid to an increasingly immigrant work-force – are a serious and important issue in many ski communities, but beyond the purview of this paper.
[189] Gilbert Coleman, *Colorado Ski Style*, 202.
[190] Childers, *Colorado Powder Keg*, 8.
[191] US Department of Agriculture, "Affected Environment," 93.
[192] Glick, *Powder Burn*, 256.

over the past several years. The Ski Area Citizens' Coalition is a ski resort watch-dog group that grades "western US ski resorts on their environmental policies and practices."[193] According to its calculations, the rise in skier numbers diminished dramatically after the 1970s. In fact, in the twenty-three year period between the 1978/1979 and 2001/2002 ski seasons, skier numbers increased less than 2 percent across the entire United States. These numbers do not hold when considering Colorado alone, since it hosts 80 percent of the US ski market, particularly in the White River National Forest. There, skier numbers have increased by 28 percent since 1985. This seems to indicate that the expansions are justified. Nevertheless, to draw skiers from other resorts and quench their thirst for more terrain, ski area expansions have increased skiable acreage in the White River National Forest by 107 percent.[194] For now, the supply of acreage exceeds demand.

Skiable Acres…to Permit Boundaries and Beyond!

These questions are not lost on Forest Service officials. In 2000, the White River National Forest came under fire for adopting a new fifteen-year forest plan that was rather forward thinking, environmentally speaking. According to then Forest Supervisor Martha Ketelle, the chosen plan emphasized "land stewardship, protecting ecosystems, and providing . . . habitat for the range of species that exist on the White River." [195] Acknowledging that the forest is a major recreation destination, the plan specified the intent to "maintain and increase, slightly, the use for recreation."[196] Environmentalists were pleased that the Forest Service finally seemed to be putting nature ahead of human interests as well as distancing itself from its suspicious and

[193] "How Are Ski Areas Graded?" Ski Area Citizens' Coalition.
[194] Ibid.
[195] Martha Ketelle, interview by Tom Bearden, *PBS NewsHour*, April 18, 2000, accessed June 24, 2013, http://www.pbs.org/newshour/bb/environment/jan-june00/white_river_4-18.html.
[196] Ibid.

semi-conspiratorial relationship with the area's ski resorts. Motorized recreationists had a fit, and Vail was not keen on the decision either, since it limited ski area expansion completely. Aspen, however, supported the plan.

In April 2000, the PBS show *NewsHour* ran a segment about the White River National Forest and the controversy around it. Ketelle began the segment by citing historical visitor statistics and future projections. Noting that White River National Forest Service officials anticipated twenty million visitors in 2020, Ketelle posed the following question: "Can we accommodate 20 million visits in 2020, or do we need to find a way to limit the visits that are being made?" [197] The uproar over the chosen alternative was such that the Forest Service retracted its decision and completed a new Environmental Impact Statement for the plan, adding several more options than originally proposed. Alternative K was ultimately selected, which granted more leeway for recreational development on public land. Presently, Breckenridge and Aspen are working on expansions, and Arapaho Basin has also released a long-term development plan which includes a 400-acre expansion.[198]

[197] Martha Ketelle, interview by Tom Bearden.
[198] Associated Press, "Aspen Expanding Snowmass Ski Resort, Arapahoe Basin Expansion on Drawing Board," *Yahoo! News*, August 31, 2012, accessed June 24, 2013, http://news.yahoo.com/aspen-expanding-snowmass-ski-resort-arapahoe-basin-expansion-191601657.html.

Chapter Three

Environmentalism at Ski Resorts: Green is the New White

Debates continue to rage over Forest Service management of the recreational uses of public lands, especially skiing, growth in ski towns, tourism economies, and the environmental impacts of each of the aforementioned. These questions sparked increased interest in the ski industry's historical exploitative relationship with the environment it depends upon, and resorts took notice.[1] Nationwide news coverage of controversies over ski area expansion, from the slopes of Vail to Aspen, Mammoth, and beyond, "placed the environmental consequences of resort development in the public forum."[2] Researchers Steelman and Rivera report that, "environmental groups, particularly in the Western United States, began in the 1990s to pressure ski areas to improve their environmental protection practices as concerns over their negative impact on sprawl, air quality, water quality, and wildlife protection increased with the expansion of the most popular resorts in the United States."[3] Furthermore, according to Gilbert Coleman, "a 1994 survey found that skiers as a whole were more active and informed about environmental issues than the general public."[4] Recognizing this, ski industry publications urged resorts, "If you have an environmental program, stick with it. If you don't, get one."[5] The watershed moment, however, was the Vail fires. Spawning an environmental awakening, the arsons "placed skiing in the limelight as an activity that significantly impacts the environment."[6] Resorts could no longer

[1] Gilbert Coleman, *Ski Style*, 197.
[2] Ibid.
[3] Toddi Steelman and Jorge Rivera, "Voluntary Environmental Programs in the United States: Whose Interests are Served?" *Organization & Environment* 19, no. 4 (2006): 518 – 519.
[4] Gilbert Coleman, *Ski Style*, 208.
[5] Ibid.
[6] Sam Spector et al., "Socially Constructed Environmental Issues and Sport: A Content Analysis of Ski Resort Environmental Communications," Sport Management Review 15, no. 4 (November 2012): 418.

pretend that their impacts were environmentally benign. With concerns over environmental sustainability quickly gaining in importance to the American public, the ski industry was forced to take action.

The National Ski Areas Association (NSAA), "the trade association for ski area owners and operators," counts 325 resorts among its membership which collectively "account for more than 90 percent of the skier/snowboarder visits nationwide."[7] In recognition of the pressure to improve eco-relations, in 2000, NSAA unveiled its *Sustainable Slopes* charter, which it promoted as a framework for sustainable resort operations.[8] Auden Schendler, Aspen Skiing Company's famed environmental guru (his official title is Vice President of Sustainability) notes that this effort marked "the first time the industry broadly acknowledged its environmental impact and pledged to take action." [9] Updated in 2005, the charter outlines twenty-one principles in eleven different issue areas which are designed to improve "environmental performance at existing ski areas, and . . . serve as helpful guidance for planning new developments."[10] Intended to be used as a tool kit, the principles "provide overall guidance for ski areas in achieving good environmental stewardship."[11] As of 2012, over 190 resorts had signed on to the Charter, "representing over 75 percent of the ski resorts nationally by skier visits."[12] NSAA contends that by adopting the Sustainable Slopes principles, "the industry can collectively *improve environmental performance*."[13]

[7] "About Us," National Ski Areas Association, accessed June 25, 2013, http://www.nsaa.org/about-us/.
[8] National Ski Areas Association, *Sustainable Slopes: The Environmental Charter for Ski Areas* (Lakewood, CO: National Ski Areas Association , 2005).
[9] Schendler, "Applying The Principles," 127.
[10] National Ski Areas Association, *Sustainable Slopes*, 6.
[11] Ibid., 5.
[12] Ibid., 3.
[13] Ibid., 8. Emphasis in original.

In its *Sustainable Slopes Annual Report for 2012*, NSAA discusses the progress being made at resorts across the country. It praises resorts that started native plant nurseries, established baseline lighting and heating energy usage for future efficiency projects, offered free public transportation from outlying towns and cities to their resorts, celebrated Earth Day and hosted other environmentally themed education events, improved recycling and composting programs, financially supported local environmental non-profits, implemented environmentally responsible purchasing plans, used buses that relied on biodiesel, upgraded to water-efficient snowmaking equipment, donated old uniforms, sponsored employee stewardship projects, implemented environmental management systems based on the International Standards Organization code 14001, established quantitative goals for resource use reduction, purchased green power, built on-site renewable energy generation systems, and worked with communities to set regional greenhouse gas reduction goals.[14] Many participating ski areas also joined NSAA in political outreach by publicly supporting clean energy legislation, wind production tax credits, and the EPA's Power Plant Carbon Emissions Standards.[15] Eighteen resorts are currently signed up for the second year of NSAA's newest program, Climate Challenge, which supports ski areas seeking to reduce their carbon footprints by reducing greenhouse gas emissions. The first year's results came in for the 20120 *Sustainable Slopes Annual Report*, with each resort reporting both direct emissions and indirect emissions that result from energy usage.[16] These resorts have all set emissions reductions targets and must "commit to take one measurable step to reducing their GHG emissions each year in order to progress toward their target."[17]

[14] National Ski Areas Association, *Sustainable Slopes Annual Report 2012*, 4.
[15] Ibid.
[16] Other emissions related to waste disposal, skier travel, and business travel are reported on a voluntary basis.
[17] Ibid., 23.

Writing in the *Vermont Law Review*, former Director of Incentives Development at the EPA, Bob Sachs, professes that "Sustainable Slopes is groundbreaking work because of the breadth of its content. Most, if not all major areas of environmental concern are addressed."[18] Indeed, the accomplishments mentioned briefly above, and those outlined in greater detail in the *Sustainable Slopes Annual Report* and even on resorts' websites, are impressive. Any pro-environmental effort undertaken by the ski industry is worthy of praise. Nevertheless, Sachs cautions that "the challenge for Sustainable Slopes lies in its implementation." [19] Sustainable Slopes is a voluntary program. Resorts can endorse the charter and use the Sustainable Slopes logo without any obligation to actually initiate environmental projects.[20]

Researchers Jorge Rivera, Peter de Leon, and Charles Koerber studied the *Sustainable Slopes Charter* shortly after it was introduced and again five years later to assess the program's achievements. Unfortunately, their studies highlight flaws similar to those mentioned by Sachs. Despite an increased number of resorts endorsing the program over the five year period, the number of resorts that completed the "annual self-assessment tool, a key part of the program, fell from a high of 90 (52 percent) resorts in 2002 to 54 (30 percent) resorts in 2005."[21] It is true that the *Sustainable Slopes Annual Report 2012* did not mention non-adoption of the principles, nor did it address the decline in self-assessment reporting. The focus was entirely positive, and only a fraction of the endorsing ski areas submitted narratives detailing their sustainability efforts. While disappointing, this should come as no surprise, as Rivera, de Leon, and Koerber argue that evidence suggests that "purely voluntary initiatives that lack specific performance-based standards, third-party oversight, rewards for exceptional behavior, and/or sanctions for poor

[18] Bob Sachs, "National Perspective on Mountain Resorts," *Vermont Law Review* 26, no. 3 (Spring 2002): 523.
[19] Ibid.
[20] Ibid.
[21] Jorge Rivera, Peter de Leon, and Charles Koerber, "Is Greener Whiter Yet? The Sustainable Slopes Program After Five Years," *Policy Studies Journal* 34, no. 2 (2006): 202.

performance are bound to suffer free-riding behavior."[22] Moreover, the authors note that many resorts merely tackle the "low-hanging fruit" and "predominantly adopt natural resources conservation practices that are known to be easier and more visible for their customers (such as recycling) or those that offer immediate short-term benefits with relatively small investment such as energy and water conservation."[23] Thus, the Sustainable Slopes program promotes comprehensive ecological programming while simultaneously enabling greenwashing. By using the logo and advertising environmental practices on a website, a ski area could market itself as a green ski area without implementing meaningful programs that go "beyond compliance," as the Charter prescribes.[24]

In 2001, the Ski Area Citizens' Coalition (SACC) devised an independent, non-industry grading system for ski areas' environmental efforts that seeks to separate the green-washers from the genuinely eco-enlightened. Each year, SACC grades ski areas in eleven different Western states. Specter et al. note that in 2012, SACC evaluated 82 resorts, and of those, 74 were endorsing members of NSAA's Sustainable Slopes program.[25] On its website, SACC acknowledges that resorts will always have environmental impacts, and asserts that its intent is to "rate resorts on the environmental performance of their current management, not on the impacts from the time of the creation of the resort."[26] SACC developed four overarching categories with which to grade resorts, and these criteria are weighted to reflect the degree to which they impact the environment. The categories were determined using scientific research, case studies, Forest Service documents, US Fish and Wildlife documents, as well as ski industry publications and

[22] Rivera, de Leon, Koerber, "Is Greener Whiter Yet?" 215 – 216.
[23] Ibid.
[24] NSAA, *Sustainable Slopes*, 5.
[25] Spector et al., "Socially Constructed Environmental Issues and Sport," 420.
[26] "Why Ski at Ski Areas with a Positive Environmental Grade?" Ski Area Citizens' Coalition, accessed July 2, 2013, http://www.skiareacitizens.com/index.php?nav=why_ski.

marketing materials. Accordingly, resorts are judged based on their degree of habitat protection, protecting watersheds, addressing global climate change, and environmental policies and practices. Ski areas are awarded points in each category and are given a final grade based on an A – D scale.[27] Perhaps unsurprisingly, for the 2012/2013 rankings, all but one of the top ten ski areas with the best ranked environmental initiatives graded by SACC were endorsing members of the Sustainable Slopes Charter.[28] At the other end of the spectrum, nine out of the ten worst performing ski areas were also endorsing members of the Sustainable Slopes Charter, and each of these resorts scored a 'D.' The one ski area that was not part of the Sustainable Slopes program eked out a 'C.'[29]

Functionally, it does not look good for Sustainable Slopes-supporting resorts to fail SACC's report card, although SACC has been criticized for being overly harsh with its evaluations.[30] Yet, without greater pressure from NSAA and other, more environmentally stringent ski areas, most areas will not implement practices that address greater environmental issues such as habitat protection and expansion management.[31] Unfortunately, Rivera, de Leon, and Koerber's studies are now dated. NSAA has stated that it expects the program to evolve and include greater quantitative measures of progress, and with side programs like the Climate Challenge, it has created a framework that does just that. But the underlying Sustainable Slopes Charter is the same: it is a list of great suggestions, all of which are voluntary. Sustainable Slopes is not a bad program per se, and reading the narratives provided by participating resorts demonstrates that some resorts take environmental sustainability quite seriously. Nevertheless,

[27] "How Are Ski Areas Graded?" Ski Area Citizens' Coalition.
[28] "Top Ten," Ski Area Citizens' Coalition, accessed July 2, 2013, http://www.skiareacitizens.com/index.php?nav=top_ten.
[29] "Worst Ten," Ski Area Citizens' Coalition, accessed July 2, 2013, http://www.skiareacitizens.com/index.php?nav=worst_ten.
[30] Spector et al., "Socially Constructed Environmental Issues and Sport," 420.
[31] Rivera, de Leon, and Koerber, "Is Greener Whiter Yet?" 217.

the program, and the ski industry as a whole, would benefit greatly from institutional incentives for greater adoption. Now more than ever, ski area environmental initiatives are needed particularly because of the threat climate change poses to the sport.

Winter on Borrowed Time

"Winter as we know it is on borrowed time," asserts Elizabeth Burakowski, a researcher at the University of New Hampshire.[32] Bob Sachs appears to agree, noting, "If there has ever been an industry that relies on the environment, especially cold weather, it is the ski industry. Climate change and rising global temperatures have tremendous adverse implications for the ski industry."[33] Writing in a *New York Times* blog about energy and the environment, Joanna Foster repeats an oft reported wintertime factoid: the 2011/2012 winter "was the fourth-warmest on record since 1896 and saw the third-lowest snow cover since record-keeping on that kind of data began in 1966."[34] Another journalist writing in the online magazine, *Adventure Journal*, reveals that average winter temperatures have warmed 2.2 degrees Fahrenheit since 1970. For the ski industry, this warming trend could either be "a rude awakening or the nail in the coffin, depending on how closely you've paid attention to the effects of climate change on snowfall."[35] Auden Schendler has gone as far to call climate change an existential threat to the ski industry. These claims might strike some as alarmist, but they all boil down to one simple fact: no snow, no ski.

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[32] Joanna M. Foster, "Warming Ski Slopes, Shriveled Revenues," (includes interview with Elizabeth Burakowski) *The New York Times Green: A Blog About Energy and the Environment,* December 7, 2012, accessed February 3, 2013, http://green.blogs.nytimes.com/2012/12/07/warming-slopes-shriveling-revenues/?ref=us.
[33] Sachs, "National Perspective on Mountain Resorts," 521.
[34] Foster, "Warming Ski Slopes."
[35] Claire Martin, "Study: Climate Change Will Devastate Snow Economy," *Adventure Journal*, December 6, 2012, accessed February 2, 2013, http://www.adventure-journal.com/2012/12/study-climate-change-will-devastate-snow-economy.

According to the authors of a study published in 2010 in the journal, *Geographical Research*, "High altitude mountain regions globally are considered to be some of the most vulnerable places in the world to climate change, and are already experiencing change including ice and snow melt."[36] No one knows for sure just how much warming we will experience globally; thus, the gravity of the impacts on snow and the ski industry will depend on the region and the quantity of emissions actually produced. Nevertheless, climate projections forecast warming trends to continue into the future, with higher emissions necessarily entailing greater magnitudes of warming. In the Southwestern United States and Rocky Mountain regions, warming scenarios will lead to "decreases in winter snowpack, shortened snow seasons, and increases in wet-snow avalanches," all of which will negatively impact the US ski industry.[37]

In Colorado alone, high emissions scenarios forecast average winter temperatures to increase between five to seven degrees Fahrenheit over the next century. Warmer air temperatures, of course, impact precipitation. As minimum nighttime temperatures rise, "a greater proportion of winter precipitation will fall as rain instead of snow."[38] A recent climatological study on snowpack in North America determined that under a high emissions scenario, snow cover in late spring in the US Rocky Mountains will likely be near-zero, and "significant reductions in snow depth are apparent for all winter and spring months by the late twenty-first century."[39] To put these predictions into perspective, consider the assertion, based on the same higher-emissions climate models, that "Park City, Utah, will lose all mountain snowpack by the end of the century while Aspen Mountain, Colorado snowpack will be confined

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[36] Catherine M. Pickering, J. Guy Castley, and Michelle Burtt, "Skiing Less Often in a Warmer World: Attitudes of Tourists to Climate Change in an Australian Ski Resort," *Geographical Research* 48, no.2 (2010): 137.
[37] Burakowski and Magnusson, *Climate Impacts*, 7.
[38] Ibid., 25. In some regions, such as the northeastern and western United States, this is already happening.
[39] Synte Peacock, "Projected Twenty-First-Century Changes in Temperature, Precipitation, and Snow Cover over North America in CCSM4," *Journal of Climate* 25 (2012): 4421 – 4422.

to the top quarter of the mountain."[40] Another study indicates that "snowpack in the Cascades and Sierra Nevada could fall by 70 percent by 2050."[41] That is within the lifetime of the many young skiers, riders, and other winter sports enthusiasts who anticipate the snow season each year. Indeed, "as temperatures rise, analysts predict that scores of the nation's ski centers, especially those at lower elevations and latitudes, will eventually vanish."[42] The future of winter looks grim.

What happens when there is less snow on mountains? Resorts find the length of their seasons constrained. During the 2011/2012 ski season (again, one of the warmest winters recorded since 1896, with a noticeable skiing-on-rocks dearth of snow) 50 percent of resorts responding to the NSAA's end-of-the-year survey reported opening late, and 48 percent had to close early.[43] The snow cover was simply not good enough to economically justify operating. In addition, during years with dismal snowfalls, fewer people ski. The 2001/2002 winter was another abnormally warm season, with actual temperatures nearly reaching those "predicted under mid-range scenarios for the 2050s."[44] That winter saw significant declines in visitation at ski areas across North America as compared with the average visitation numbers for years previous. Again in the 2006/ 2007 winter, below average snowfall in the Sierra Nevada, northern Rockies, and northeastern United States is considered a strong factor for the decrease in four million skier visits as compared to the previous year. More recently, the 2011/2012 ski season saw a decline of nine million skiers versus the previous season. Researchers point out that these

[40] Burakowski and Magnusson, *Climate Impacts*, 9.
[41] O'Connor, Mary C., "The End of Snowsports?" The Outside Blog, December 6, 2012, accessed February 3, 2013, http://www.outsideonline.com/blog/the-end-of-snow-sports.html.
[42] Katherine Q. Seelye, "Rising Temperatures Threaten Fundamental Change for Ski Slopes," *The New York Times*, December 12, 2012, accessed February 3, 2013, http://www.nytimes.com/2012/12/13/us/climate-change-threatens-ski-industrys-livelihood.html?pagewanted=1&_r=2.
[43] Burakowski and Magnusson, *Climate Impacts*, 3.
[44] Pickering, Castley, and Burtt, "Skiing Less Often," 144.

falling visitation numbers did not directly overlap the economic recessions of the 2000s, and therefore consider low snow cover to be the predominant factor influencing skier visits.[45] This phenomenon was also documented in a 2010 Australian research study which, after surveying skiers at a large Australian ski resort, determined that skiers report being sensitive to snowfall totals. Ninety percent of the skiers questioned indicated that they "would ski less often, not at all, or overseas if there was little natural snow cover in the next five years."[46]

At resorts and in ski towns, "snow is currency."[47] The economic impacts of decreased snow cover affecting both the length of the ski season as well as the number of skier visits could be devastating for the ski industry and for resort towns and the restaurants, grocery stores, bars, and other businesses supported by winter tourism. In December 2012, University of New Hampshire researchers Elizabeth Burakowski and Matthew Magnusson, in partnership with the Natural Resources Defense Council (NRDC) and the environmental group Protect our Winters (POW), published the report, *Climate Impacts on the Winter Tourism Economy*. Whereas previous research focused on the physical ramifications of climate change, this study is unique in that it quantifies the economic losses incurred by warming winters. While one bad winter season cannot be blamed on climate change, low-snow years give an indication of what the ski industry can expect according to warming predictions.

Throughout the United States during the 2009/2010 season, winter sports tourism supported 211,900 jobs in thirty-eight states and was responsible for contributing approximately

[45] Burakowski and Magnusson, *Climate Impacts*, 6 – 7.
[46] Pickering, Castley, and Burtt, "Skiing Less Often," 142.
[47] Burakowski and Magnusson, *Climate Impacts*, 3.

$12.2 billion to the US economy.[48] Interviewed in the *New York Times*, ski tourism researcher Daniel Scott explained that certain warming scenarios would leave more than half of the ski areas in the Northeast unable to open for more than one hundred days per season by 2039. Unfortunately, that is hardly the worst part. "By then, no ski area in Connecticut or Massachusetts is likely to be economically viable. . . . Only 7 of 18 resorts in New Hampshire and 8 of 14 in Maine will be. New York's 36 ski areas, most of them in the western part of the state, will have shrunk to 9."[49] In New Hampshire, the winter tourism industry, which includes both skiing and snowmobiling, provided nearly 8,000 jobs and contributed $451 million in revenue to the state's economy in 2010. Yet already, lower-snowfall winters have seen decreases in skier visitation of up to 17 percent and have cost the state's ski areas roughly $54 million in lost revenue.[50] Climate models indicate that by the end of the century, "the snow season could be reduced by 25 percent to 50 percent, with larger reductions under higher-emissions scenarios."[51] Given these numbers, it is surprising that Scott anticipates that even seven New Hampshire ski areas will still manage to operate. In Pennsylvania, the story is the same. Low-snow years have cost the state's ski areas nearly $68 million in lost revenue and have resulted in 820 fewer jobs. There, with the lower elevations of the long-eroded Appalachian Mountains now resembling nothing more than craggy hillsides, Burakowski and Magnusson expect the snow season to be limited to highland areas by the end of the century.[52] The refrain repeats: the future of skiing on the East Coast is not snow-white bright, but grim.

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[48] Ibid. In their study, Burakowski and Magnusson include both downhill skiing and snowmobiling in their definition of winter sports tourism; however, skiing accounts for the great majority of winter sports tourism economic activity.
[49] Seelye, "Rising Temperatures Threaten."
[50] Burakowski and Magnusson, *Climate Impacts*, 28.
[51] Ibid.
[52] Ibid., 29.

Out west, higher altitudes might buffer the impacts of warming, but state and regional economies will not remain unscathed. With 20 percent of the total skier visits in the United States, Colorado boasts the country's largest ski industry. In 2010, winter tourism employed over 37,000 people and added $2.2 billion to the state's economy. Again, low-snow years have resulted in losses of $154 million dollars and 1,900 fewer jobs when compared to high-snowfall years.[53] In previous years, revenues in Utah have dropped $87 million. The entire Rocky Mountain region, including Colorado, Utah, Idaho, Wyoming, and Montana, loses $235 million in low-snow years.[54] Across the entire United States, winters with below average snowfall over the past fifteen years have caused the loss of about 13,000 jobs and $800 million to $1.9 billion in reduced economic activity.[55] Climate change poses a clear and present economic risk to the ski industry and to ski towns, where fewer jobs and less revenues mean that it becomes much more difficult for local families, businesses, and schools to sustain themselves. These losses are likely to become a whole lot worse over the next several decades, placing the ski industry on very thin ice – or snowpack.

One of the more widespread adaptation strategies is snowmaking. Innovations in snowmaking technology allow resorts to make snow using less energy, which is a great improvement as snowmaking can often account for more than half of a resort's energy bill.[56] Despite the innovations, climate change throws a wrench in the ability to use snowmaking indefinitely as a fix for warming winters. It is a law of nature that water freezes at thirty-two degrees Fahrenheit. In order to make good quality snow, ambient air temperatures should be less

[53] Burakowski and Magnusson, *Climate Impacts*, 25.
[54] Ibid., 15.
[55] O'Connor, "The End of Snowsports?"
[56] Burakowski and Magnusson, *Climate Impacts*, 3.

than thirty degrees – the colder, the better.[57] Yet "as temperatures have climbed, nighttime minimums have increased more quickly than daytime average temperatures. . . . So although alpine resorts . . . are extending their seasons by adding snowmaking, at some point it will be too warm to blow manmade snow."[58] Not only will it be too warm, but it might also be too expensive. Out west, resorts typically spend upwards of $1 million on snowmaking each year. If annual revenues fall enough, operators might wrestle with the costs and benefits of full capacity snowmaking.[59]

Water scarcity, too, will pose snowmaking problems. As temperatures warm throughout the Rockies and snowpack decreases, spring and summertime melt will also dwindle, impacting the amount of runoff available to replenish groundwater supplies and river flows. According to an article in *World Watch Magazine*, warming temperatures in high alpine areas of Wyoming, Utah, and Colorado will lead to decreased moisture levels in the snowpack, which will, in turn, diminish the amount of water stored throughout the Colorado River Basin by half. Decreases in stored water supply will directly affect the communities across western states that rely on the Colorado River for their water supplies.[60] With increased incidence of drought also predicted for the region, water scarcity and water rights stand to become heated issues – as we have already seen with the Forest Service preemptively rethinking water use on its properties.[61] Although Colorado's water laws assign rights to the first user ("first in time, first in right"), should water

[57] "Wet Bulb Temperature Chart," Snow at Home, accessed July 7, 2013, http://www.snowathome.com/pdf /wet_bulb_chart_fahrenheit.pdf.
[58] Chelsea Little, "With Climate Changing and Political Action Neglected, Snow Sports Have Much to Lose – From Dollars to Jobs," Fasterskier.com, December 25, 2012, accessed February 3, 2013, http://fasterskier.com/article/as-climate-changes-and-political-action-neglected-snow-sports-have-much-to-lose-from-dollars-to-jobs/.
[59] Foster, "Warming Ski Slopes."
[60] Lina Barrera, "Portraits of Climate Change: The Rocky Mountains," *World Watch Magazine* (July/August 2009): 15.
[61] Little, "With Climate Changing and Political Action Neglected."

scarcity become a serious problem in the Rockies, it will be hard to justify placing a ski area's water use over the needs of local communities.[62]

For those who love to ski or who enjoy other wintertime outdoor recreation activities, for those who live in mountain towns, and for those whose incomes are dependent on a thriving winter tourism industry, climate change is a formidable foe. Past low-snowfall years are the economic and meteorological harbingers of the warmer winters yet to come. But the situation does not have to be as dire as the high emissions models predict. If the global community can come together to effectively curb emissions, the whole world will be better off, the global ski industry included. Logically, one would think that resort operators in the United States should realize the huge stakes they have in the climate crisis – the existential crisis unexaggeratedly described by Aspen's Auden Schendler – and vociferously demand policy action, as well as do all they can individually to reduce emissions and lead by example. On a broad scale, this is not happening. NSAA reports that while a recent survey of ski resorts indicated that 80 percent of respondents were "very interested in addressing climate issues," only 10 percent had actually completed a greenhouse gas inventory.[63] So far only eighteen resorts have signed up for NSAA's Climate Challenge. Granted, participation in the Climate Challenge does not mean a resort cannot independently address climate change. Vail Resorts recently set the goal of reducing its energy usage by 10 percent over the next ten years (after already reducing 10 percent since 2008).[64] And Aspen has long been an environmental leader among US ski areas.

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[62] "Water Rights Planning," Denver Water, accessed July 8, 2013, http://www.denverwater.org/SupplyPlanning/WaterRights/.
[63] Dave Wortman, "The Climate Challenge: Taking Sustainability to the Next Level," *NSAA Journal* (February/March 2012): 30.
[64] Scott Condon, "Resorts Sound Off on Perils of Climate Change," *The Aspen Times*, December 24, 2012, accessed February 16, 2013, http://www.aspentimes.com/article/20121224/NEWS/121229955.

In 2001, Aspen Skiing Company adopted policy statements acknowledging that climate change is a threat to both the ski industry and the environment and asserted the company's belief that a proactive strategy is the best course of action for addressing climate change. Under the leadership of former CEO Pat O'Donnell and now Schendler, the company developed the ski industry's first comprehensive plan to cut emissions and reduce energy use and has since initiated many other innovative projects seeking to lessen the direct and indirect environmental impacts of skiing. Most recently, the resort invested over $5 million in "a plant that produces electricity by using methane vented from a coal mine near Paonia."[65] This plant will produce enough electricity to completely power the company's annual electricity needs. These myriad innovations have enabled Aspen to hold its carbon emissions more or less flat between 2000 and 2011, despite growing and increasing revenue by 41 percent. [66]

Aspen, however, is in the vanguard, thanks to management that has internalized the importance of environmental stewardship and is not politically intimidated by openly addressing climate change. Schendler is worried about warming, and rightly so. His level of concern, however, is not matched by many, which has left him understandably frustrated with the lack of collective action on the part of the ski industry: "Why is no one trying to address the root problem? Why not take a shot at saving the industry while there's still time rather than giving up and saying we'll just adapt while we can?"[67] He even points the finger at one New York state ski area CEO who admits that climate change is occurring, although he is unsure if it is "a natural cycle or not."[68] Schendler counters that "the CEO of a ski resort is fiscally obligated to know if

[65] Condon, "Resorts Sound Off."
[66] Allen Best, "Using Skiing to Make Case for Climate Action: Vail Resorts & Aspen Skiing and the Big Issue of Our Time," Mountain Town News, January 24, 2013, accessed February 16, 2013, http://mountaintownnews.net/?p=457.
[67] Foster, "Warming Ski Slopes," (includes interview with Auden Schendler).
[68] Ibid.

it's human-caused or not, because the answer to that, which is pretty straightforward, enables you to solve the problem or not."[69]

Admittedly, most resort executives understand that climate change is real and exacerbated by human actions. According to Schendler, "they just choose not to take political action, instead tending toward adaptation, for instance installing more snowmaking or working to minimize their carbon footprint."[70] Individual adaptation measures have been the status quo for several years now. Writing about ski industry climate change adaptation in 2007, Daniel Scott and Geoff McBoyle commented, "Discussions with ski industry stakeholders suggest that most climate change adaptations are likely to be incremental adjustments of existing strategies to reduce risks posed by current climate variability. Many North American ski area managers have indicated they perceive the risk of climate change to be very low over any relevant business-planning horizon."[71] In the six years that have passed, inertia continues to supersede radical action by the ski industry. Fittingly, the back page of the most recent Aspen/Snowmass Sustainability Report accuses, "Complacency is the enemy of the good society."[72]

It is worth noting that the only resort company still publicly traded on the New York Stock Exchange, Vail Resorts, does not mention climate change at all in its 2012 annual report to shareholders, nor is there any mention of climate change on its corporate website – energy efficiency, yes; emissions reductions, yes; but not climate change. Politically, climate change remains a highly contentious issue in the United States, and it is possible that resorts do not want to engage in climate advocacy for fear of alienating their clientele. The example of Aspen's

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[69] Little, "With Climate Changing and Political Action Neglected," (includes interview with Auden Schendler).
[70] Ibid., (includes interview with Auden Schendler).
[71] Daniel Scott and Geoff McBoyle, "Climate Change Adaptation in the Ski Industry," *Mitigation and Adaptation Strategies for Global Change* 12, no. 8 (2007): 1426.
[72] Aspen/Snowmass, *Sustainability Report 2012* (Aspen, CO: Aspen Skiing Company, 2012), accessed July 10, 2013, http://www.aspensnowmass.com/-/media/Sustainability/2010-2011_ASC_Sustainability_Report.pdf.

increasing revenues proves, however, that going green does not mean losing green. Eventually, resorts will need to weigh the costs of alienating a few climate-denier skiers with the costs of inaction: shrinking snowpack and shrinking bottom-lines. Because while individual projects designed to improve environmental stewardship and address climate change at the resort level are important and should not be undervalued, they are not enough. As one writer puts it, "the ski industry is small potatoes in the grand picture of climate change."[73] The inconvenient truth for the ski industry, according to Schendler, is that "Climate change demands more of us, unfortunately."[74]

Collectively the ski industry could have a powerful and influential political voice in the United States, and driving policy change is something Schendler would like to see the industry do.[75] "The way for the ski industry to make a difference environmentally," he says, "is to use its iconic status as a climate dependent industry to demand action on global warming from Washington."[76] This idea is echoed in Aspen's 2012 sustainability report, which states, "Most businesses trying to be sustainable focus on greening their operations and products. But that's not nearly enough to stop climate change, and therefore doesn't achieve true sustainability. If climate change doesn't get fixed, business can't be sustainable. That's why corporations must become climate activists, pushing for big scale solutions."[77] Schendler shares this belief with others. US climate prophet Bill McKibben believes "we're at the point where structural change is required, which means politics, which means rocking the boat. …Most industry types don't like

[73] Erme Catino, "A Critical Look at the Climate Challenge," *Ski Area Management* (January 2013), 54, accessed February 9, 2013, http://www.saminfo.com/article/critical-look-climate-challenge.
[74] Janice Kurbjun, "Climate Change's Threat to Ski Industry Spurs Action, Opinions Differ on the Best Tactics for Resorts to Pursue," (includes interview with Auden Schendler) *Summit Daily News*, January 10, 2012, accessed April 12, 2012, http://www.summitdaily.com/article/20120110/NEWS/120109816.
[75] Little, "With Climate Changing and Political Action Neglected."
[76] Kurbjun, "Climate Change's Threat," (includes interview with Auden Schendler).
[77] Aspen/Snowmass, *Sustainability Report 2012*, 2.

to do that – but you'd think the ski industry, above all others, would realize their backs are to the wall."[78] Put another way, Anita Herzog, the assistant director of NRDC's Climate Center, quipped that the ski industry needs to "take its head out of the snow before it melts."[79]

As of this writing, several months have passed since the publication of the NRDC/POW/University of New Hampshire report in December 2012, which spawned many of the conversations quoted in these pages. In late May 2013, 108 US ski areas along with forty other prominent American businesses joined Ceres, an advocate for sustainability leadership, in signing a Climate Declaration, "which calls upon federal policy makers to seize the American economic opportunity of addressing climate change."[80] It is not a terribly radical gesture, and the signatories are not bound to anything by signing, but the action is symbolic – and public.

The ski industry need not only advocate to Congress for climate action. There is a contingency of fifteen to twenty million Americans who visit downhill ski areas each year.[81] These individuals have a stake in the future of the ski industry, too. NSAA has recognized this, explaining, "Ski areas are in a unique position – vulnerable to climate change, yet with high visibility to demonstrate by example and communicate solutions to millions of visitors annually."[82] McKibben chimes in, suggesting that the ski industry can launch an educational campaign directed at skiers and snowboarders. Resorts could put "a sign on every ski lift tower saying 'pull out your phone and call your congressman to tell him to stop caving to the fossil fuel

[78] Little, "With Climate Changing and Political Action Neglected," (includes interview with Bill McKibben).
[79] Ibid.," (includes interview with Anita Herzog).
[80] Brian Bowen and Tony Hawks, "More Than 100 Ski Areas Sign Climate Declaration, Calling for U.S. Policy Action on Climate Change," Ceres, May 29, 2013, accessed July 8, 2013, http://www.ceres.org/press/press-releases/more-than-100-ski-areas-sign-climate-declaration-calling-for-u.s.-policy-action-on-climate-change#List.
[81] "2013 SIA Snow Sports Fact Sheet," SnowSports Industries America.
[82] National Ski Areas Association, *Sustainable Slopes Annual Report 2012*, 19.

industry and do something about climate change before winter vanishes forever.'"[83] Again, ski area operators may be wary of engaging their visitors in a politically contested issue, but climate change threatens to melt resorts out of business. Which is worse?

Even if select resorts elect to keep ignoring climate change as they struggle to blow more and more snow, Schendler, POW, and NRDC are hopeful that skiers, snowboarders, and other winter sports participants will take up the cause, urging their local politicians to pay greater attention to climate change. Once a critical mass of climate advocates builds, the political cost of meaningfully addressing climate change disappears. This is what we, as a global society and as an American society, desperately need – a mass move toward a greater culture of sustainability. Yes, much of the impetus will come from policy enacted by institutions. Nevertheless, this process will occur much faster and with much less resistance if civil society is anxious for the changes to take form. If advocacy from the ski industry gets more people on the climate action bus by successfully reaching those who are otherwise having difficulty connecting the dots between our industrialized, fossil fueled lifestyles and climate change, then it is both good for skiing and for the planet. Bob Sachs concurs, noting, "Ski resorts and NSAA have the potential to become environmental leaders for the tourism industry. Their actions could educate not only skiers, but also tourists and observers of the tourism industry. It will not be easy or fast, but the potential to create greater demand for improved environmental performance exists for this industry. They could run with it."[84] They should.

[83] Little, "With Climate Changing and Political Action Neglected," (includes interview with Bill McKibben).
[84] Sachs, "National Perspective on Mountain Resorts," 539.

Chapter 4

Literature Review

Public awareness of environmental issues is growing, and skiers do not recreate in a vacuum. Studies have shown that ski tourists are indeed concerned about the environmental impact of the sport and would participate in programs that would help offset the negative consequences of skiing.[1] In fact, one study conducted in Austria found that over half of the skiers surveyed considered environmental information at ski resorts important. More than half were willing to pay an environmental "tax" if the contribution would be spent on environmental programming.[2] Because of this demonstrated interest, and especially because of the bane of climate change, ski resorts have a unique opportunity to educate their clientele about environmental issues and the actions they can take to address them. Indeed, environmental outreach is even a part of the *Sustainable Slopes Charter*, which explains, "Because of their setting in an outdoor, natural environment and the direct connection between that natural environment and the guest experience, ski areas have an excellent opportunity to take a leadership role in environmental education and in enhancing the environmental awareness of their guests, surrounding communities, and employees."[3]

This quote from the *Sustainable Slopes Charter* could not be a more perfect segue to the following exploration of two key mechanisms involved in linking skiing and environmental concerns and behaviors. *Environmental concern* is conceptualized as "the collection of one's

[1] Otmar Weiss, Gilbert Norden, Petra Hilscher, and Bart Vanreusel, "Ski Tourism and Environmental Problems: Ecological Awareness Among Different Groups," *International Review of the Sociology of Sport* 33, no. 4 (1998): 371 – 374.
[2] Ibid., 374 – 377.
[3] National Ski Areas Association, *Sustainable Slopes*, 14.

values that influence attitudes and behaviors towards conservation of natural areas."[4] *Pro-environmental behaviors* (or just *environmental behaviors*) constitute a wide range of actions "that consciously seeks to minimize the negative impact of one's actions on the natural and built world." Through offering environmental education, tourism locales such as ski resorts can encourage environmental concerns and behaviors among their visitors; and, by visiting the same resort multiple times, skiers can develop a *sense of place,* also leading them to demonstrate increased environmental concern and pro-environmental behaviors. Therefore, just as the *Sustainable Slopes Charter* implied, ski resorts are indeed superbly positioned to communicate environmental messages to their clientele. This chapter will further examine these two areas of study, investigating the impacts the sport could have upon the many people who flock to the slopes each year to ski and ride.

Tourism + Environmental Education + Environmental Concern and Behaviors

> In the end, we will conserve only what we love, we will love only what we understand, and we will understand only what we are taught.
>
> – Baba Dioum, Senegalese poet

A key question for those of us concerned about the global environment and Western society's impact upon it is determining how to encourage others to care, too. How do we foster the creation of environmental ethics? How do we influence societal change towards a culture of sustainability? Environmental education has been proposed as one mechanism for encouraging environmentalism, and ecotourism, an off-shoot of the sustainable development framework, attempts to nurture environmental concerns, attitudes, and behaviors by transforming tourist attractions into natural classrooms.

[4] Diane Gaede, Drew Strickert, and Richard R. Jurin, "Nature-Based Tourism Businesses in Colorado: Interpreting Environmental Ethics and Responsible Behavior," *Journal of Tourism Insights* 1, no 1 (2010): 53.

Introducing her paper published in the *Journal of Sustainable Tourism*, researcher Narelle Beaumont declares, "Enjoyable experiences in the natural environment associated with learning about natural processes are said to be the stimulus for developing a rapport with nature and a desire to protect and care for it."[5] It is an intriguing notion, and not one that has been overlooked. The following discussion will focus on educational and interpretive programs at ecotourism destinations. While sprawling ski resorts do not fit within traditional definitions of ecotourism, their location in and reliance upon the natural environment allows us to draw parallels between ecotourism research and the potential for ski areas to pursue greater educational outreach programming.

Nature as a Tourist Destination

In the 1980s, the United Nations initiated the World Commission on Environment and Development (WCED, also known as the Brundtland Commission) with the aim of studying the relationship between humans and nature. The result was the publication of *Our Common Future*, the document that first introduced the idea of "sustainable development" to the world. Defined by the Brundtland Commission as development that "seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future," sustainable development has been touted as an antidote to traditional modes of development which often ignore local social and ecological contexts.[6] As Australian scholar Bobby Banerjee explains, sustainable development is not only a mechanism for mediating the relationship between economic growth and environmental degradation, it "also focuses on social justice and human

[5] Narelle Beaumont, "Ecotourism and the Conservation Ethic: Recruiting the Uninitiated or Preaching to the Converted?" *Journal of Sustainable Tourism* 9, no. 4 (2001): 320.
[6] The World Commission on Environment and Development *Our Common Future* (New York: Oxford University Press, 1987), chap. 1, para. 49, accessed October 10,2012, http://www.un-documents.net/our-common-future.pdf.

development within the framework of social equity and the equitable distribution and utilization of resources."[7]

Though sustainable development is relevant to many fields, one important innovation crafted out of the sustainable development framework is sustainable tourism. Just as sustainable development is designed to be a tool for more thoughtful development programs, be they economic, social, agricultural, domestic, or international, sustainable tourism aims to ameliorate the negative effects of the often exploitative mass tourism industry. Hence the belief, "If there is a single factor that has the potential to change the nature of tourism more than any other, it is the introduction of the concept of 'sustainable development.'"[8] Yet despite nearly thirty years of research, there is no single agreed upon definition of sustainable tourism. Indeed, in his article, UK tourism researcher Richard Butler compiles seven definitions from other papers and remarks that the myriad definitions mean that it is unlikely "that there will ever be a totally accepted definition of sustainable tourism that is universally applied, because the very success of the term lies in the fact that it is indefinable and thus has become all things to all interested parties."[9] "Sustainable tourism" can mean different things to tourism operators, conservationists, environmentalists, politicians, and even tourists themselves. After all, a literal understanding of the term "sustainable tourism" merely denotes a tourism industry that lasts into the foreseeable future, but does not necessarily take into account the sustainability of the local environment or community.

The United Nations World Tourism Organization defines sustainable tourism as tourism that "meets the needs of present tourists and host regions while protecting and enhancing

[7] Subhabrata Bobby Banerjee, "Who Sustains Whose Development? Sustainable Development and the Reinvention of Nature, *Organization Studies* 24, no. 1 (2003): 152.
[8] Richard W. Butler, "Sustainable Tourism: A State-of-the-Art Review," *Tourism Geographies* 1, no. 1 (1999): 8.
[9] Ibid., 11.

opportunities for the future."[10] This organization, created after the 1992 Earth Summit held in Rio de Janeiro, lists the following elements required for sustainable tourism development: resources, whether natural, historical, or cultural, should be preserved such that they will still be useful in the future; planning and management of tourist attractions should not cause serious ecological or socio-cultural problems; tourism should not degrade the local environment; tourists' satisfaction should be maintained such that these areas retain their commercial appeal; and tourism should benefit all members of society.[11]

Butler presents a similar definition, which he says describes the idea of sustainable tourism as it is usually written about in academic literature: sustainable tourism is "tourism which is developed and maintained in an area (community, environment) in such a manner and at such a scale that it remains viable over an infinite period and does not degrade or alter the environment (human and physical) in which it exists to such a degree that it prohibits the successful development and well being of other activities and processes."[12] He further notes that "it is simply inappropriate in this day and age to develop destinations that do not strive to be as environmentally and socially benign as possible, and hence as close to sustainability as feasible."[13] Of course, sustainable tourism is a goal towards which to strive, and the reality of tourism will not always fulfill the lofty promises of this sustainable tourism ideal.

While sustainable tourism endeavors to be an ecologically friendly industry, it does not necessarily take place in natural areas nor is it always centered on nature-based activities.

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[10] United Nations World Tourism Organization, *Guide for Local Authorities on Sustainable Tourism Development* (World Tourism Organization, 1998), quoted in United Nations Environment Program, *Tourism and Local Agenda 21: The Role of Local Authorities in Sustainable Tourism* (Paris: UNEP, 2003), 7, accessed October 31, 2012, http://www.unep.fr/shared/publications/pdf/3207-TourismAgenda.pdf.
[11] United Nations Environment Program, *Tourism and Local Agenda 21*, 7.
[12] Richard W. Butler, "Tourism – An Evolutionary Perspective," in *Tourism and Sustainable Development: Monitoring, Planning, Managing*, ed. James G. Nelson, Richard W. Butler, and Geoffrey Wall, 29 (Waterloo, Ontario: University of Waterloo, Department of Geography Publication 37, 1993).
[13] Butler, "Sustainable Tourism," 18.

However, nature-based tourism is quickly gaining in popularity. Once again turning to ecotourism expert Martha Honey, she reports that in 1998, a survey of 3,342 US households demonstrated that nearly half had participated in nature-based activities during their last vacation, and 14.5 percent mentioned that the majority of their vacation time was spent engaging in these activities.[14] Unfortunately, nature-based tourism itself is not automatically sustainable. Honey recounts the early history of backcountry wilderness trips with the Sierra Club and over-visitation of US national parks, both of which have had seriously negative ecological effects. From traffic jams and exhaust fumes, to massive amounts of litter and wild animals favoring junk food rather than their traditional evolutionary fare, tourism has left an indelible mark on natural areas in the United States.[15] In fact, in 2011, Stephen P. Martin, a park official at the Grand Canyon, commented that plastic water bottles are "the single biggest source of trash" found within the canyon.[16] And, of course, the ski industry is far from ecologically benign.

Ecotourism arose as an offshoot of the sustainable tourism movement. Defined by The International Ecotourism Society (TIES) as "responsible travel to natural areas that conserves the environment and improves the well-being of local people," ecotourism developed in part as a reaction to the environmental degradation previously caused by tourists in natural areas.[17] According to Honey, its creation was also a response to the growing "demand for the kind of authentic experience that nature can provide."[18] Increasingly popular in the '70s and '80s, Honey observes that "by the early 1990s, the concept had coalesced into a hot new genre of

[14] Honey, *Ecotourism and Sustainable Development*, 11.
[15] Ibid., 11 – 12.
[16] Felicity Barringer, "Parks Chief Blocked Plan for Grand Canyon Bottle Ban" (includes interview with Stephen P. Martin), *The New York Times*, November 9, 2011, accessed October 31, 2012, http://www.nytimes.com/2011/11/10/science/earth/parks-chief-blocked-plan-for-grand-canyon-bottle-ban.html?pagewanted=all&_r=0.
[17] "What is Ecotourism?" The International Ecotourism Society, accessed October 31, 2012, https://www.ecotourism.org/what-is-ecotourism.
[18] Honey, *Ecotourism and Sustainable Development*, 13.

environmentally and socially responsible travel."[19] Since then, demand for ecotourism services has been steadily increasing. The results of a 2005 survey by the Center for Ecotourism and Sustainable Development indicated that "more than 75 percent of US travelers and 87 percent of British travelers felt that it is important for their visits to not damage the environment."[20]

Ecological sensitivity, however, is just one element of ecotourism. On its website, TIES lists a number of principles integral to ecotourism, including: minimizing impact of tourism activities, building environmental and cultural awareness and respect, providing positive experiences to both visitors and hosts, providing direct financial benefits for conservation, providing financial benefits and empowerment for local people, and raising sensitivity with respect to the host countries' political, environmental, and social climates.[21] Taking into account these principles, and including sensitivity about visiting oppressive countries, Honey summarizes ecotourism as "travel to fragile, pristine, and usually protected areas that strives to be low impact and (often) small scale. It helps educate the traveler, provides funds for conservation, directly benefits the economic development and political empowerment of local communities, and fosters respect for different cultures and for human rights."[22]

Conceptually, ecotourism is great. Yet, like sustainable tourism, it is rarely implemented in a way that fulfills the mandates of its definition, and several challenges remain for ecotourism operators. One of these challenges is to figure out how "the principles of ecotourism can be used to restructure conventional tourism and bring fundamental, not superficial, changes to the way

[19] Honey, *Ecotourism and Sustainable Development*, 13.
[20] Ibid., 26.
[21] "What is Ecotourism?" The International Ecotourism Society.
[22] Honey, *Ecotourism and Sustainable Development*, 33.

mass tourism functions."[23] Key to this effort, and a vital component of the ecotourism principles, is environmental education.

Tourism and Environmental Education

Environmental education has been a largely overlooked and unimplemented component of ecotourism. This is unfortunate as research suggests that environmental education (used here interchangeably with interpretation) within an ecotourism context fosters "awareness and understanding of the natural environment and consequently promotes proenvironmental attitudes and responsible environmental behavior."[24] Many of these educational experiences aim to inspire tourists to not only become more sensitive to the particular ecosystem they are visiting, but also to alter their general environmental behavior after returning home. In fact, Beaumont reports that "many definitions of interpretation specifically include a goal of fostering support for conservation not only in relation to the particular natural resource being interpreted but support for conservation values and principles in general."[25]

Because ecotourism takes place in natural settings, environmental education in these areas stands to have an even greater impact on tourists' environmental attitudes. In her study on people's motivations for environmental action, Louise Chawla reports that her informants consistently attributed their environmental actions or interests to a similar set of sources, including significant amounts of time spent outdoors in nature.[26] Beaumont also highlights this linkage, noting previous studies that have suggested "that the nature experience itself leads to

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[23] Honey, *Ecotourism and Sustainable Development*, 33.
[24] Beaumont, "Ecotourism and the Conservation Ethic," 317; see also Sheila Peake, Peter Innes, and Pam Dyer, "Ecotourism and Conservation: Factors Influencing Effective Conservation Messages," *Journal of Sustainable Tourism* 17, no. 1(2009): 107 – 127; Ben Sander, "The Importance of Education in Ecotourism Ventures: Lessons from Rara Avis Ecolodge, Costa Rica," *International Journal of Sustainable Society* 4, no. 4 (2012): 401.
[25] Beaumont, "Ecotourism and the Conservation Ethic," 320.
[26] Louise Chawla, "Life Paths into Effective Environmental Action," *Journal of Environmental Education* 31, no. 1 (1999): 15-26.

greater appreciation of nature and promotes pro-environment attitudes and behaviours."[27] Thus, ecotourism can have an important role to play in encouraging tourists' environmental attitudes and actions. Combining enjoyable experiences outside with learning about local natural history is thought "to be the stimulus for developing a rapport with nature and a desire to protect and care for it."[28]

Nevertheless, some researchers have called these arguments "simplistic" and have expressed doubt as to whether or not experiential environmental education through ecotourism adventures will actually lead to behavior change.[29] The mechanisms influencing human behavior are very complex, which therefore poses a challenge for encouraging behavior change.[30] Moreover, contextual factors such as age, educational background, culture, or even language can make truly effective interpretation difficult to achieve. In their research investigating why some people act environmentally and others do not, Anja Kollmuss and Julian Agyeman explain, "We see environmental knowledge, values, and attitudes, together with emotional involvement as making up a complex we call '*pro-environmental consciousness.*' This complex in turn is embedded in broader personal values and shaped by personality traits and other internal as well as external factors."[31] It is this deeply rooted pro-environmental consciousness which, according to these authors, influences environmental behaviors. Nevertheless, educational psychology research has identified powerful strategies for facilitating learning, which Mark Orams, associate director of the New Zealand Tourism Research Institute, theorizes could also be used in an

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[27] Beaumont, "Ecotourism and the Conservation Ethic," 318.
[28] Ibid.," 320.
[29] Mark Orams, "The Effectiveness of Environmental Education: Can We Turn Tourists into 'Greenies'?" *Progress in Tourism and Hospitality Research* 3 (1997): 295.
[30] Although I do give more detail later, a thorough examination of environmental psychology is beyond the purview of this paper.
[31] Anja Kollmuss and Julian Agyeman, "Mind the Gap: Why Do People Act Environmentally and What are the Barriers to Pro-Environmental Behavior?" *Environmental Education Research* 8, no. 3 (2002): 256.

ecotourism context to influence behavior change.[32] He contends, "If the nature-based tourism industry is to make a positive contribution to the conservation of the natural environment, operators must adopt carefully designed educational programmes which incorporate lessons from the educational psychology fields."[33]

Orams developed an interpretive model which includes five techniques for prompting behavior change: sparking curiosity, influencing the affective domain, defining clear motivation and an incentive to act, providing an opportunity to act, and conducting an effectiveness assessment.[34] Using this framework, he created an educational program which was implemented at a wild-dolphin attraction in Australia. Some guests received interpretation, and some did not. Whereas immediately after the visit both study groups reported increased desire to change their behaviors, follow-up interviews conducted a few months later showed that significantly more of the tourists who participated in the education program actually did.[35] Orams calls these results encouraging, concluding, "This research has shown that despite many authors' cynicism . . . behavior change can be prompted by a carefully structured education program."[36]

Another challenge facing interpretation programs revolves around the "debate about whether providing environmental education can lead to a change in attitudes, particularly by the intervention of a short interpretive programme."[37] This question is important to consider given the relatively brief amount of time most people spend on vacation, and even shorter amount of time spent engaged in interpretation activities. In 2001, Narelle Beaumont set out to investigate whether short-term experiences could successfully mediate behavior change by examining the

[32] Orams, "The Effectiveness of Environmental Education," 297 – 298.
[33] Ibid., 295.
[34] Ibid., 297 – 298.
[35] Ibid., 303 – 304.
[36] Ibid., 304.
[37] Beaumont, "Ecotourism and the Conservation Ethic," 320.

effects of environmental interpretation upon different ecotourist groups visiting Lamington National Park in Queensland, Australia. She discovered that among her research groups, bused-in day visitors initially had the lowest levels of both environmental interest and involvement. However, they were also "the most likely of all ecotourist groups in the on-site survey to indicate that the experience had influenced their conservation views and behavioural intentions."[38] Overall, nearly one-fifth of the participants surveyed on-site at the time of the visit and one-third of those surveyed a few months later indicated that the visit did positively influence their conservation views. Thus, Beaumont believes "that ecotourism does have the potential to make people more aware and appreciative of conservation issues."[39] The results of follow-up questionnaires sent four months after the initial study indicated that 14 percent of the respondents had adopted new environmental behaviors as a result of their experiences. This number may seem low, but is nevertheless encouraging, as only 9 percent of the respondents had initially responded that they would change their behaviors.[40]

Beaumont's findings demonstrate that a short ecotourism experience with limited environmental education has the potential to influence the views of people who are not full-fledged environmentalists, especially if they are motivated to experience and learn about nature. However, the results also indicate that this effect was only short term and did not persist once the groups had returned to their daily lives and the impacts of the visit had dissipated. In order to ensure that these effects do not fade over time, particularly for the low-awareness groups with blossoming conservation ethics, it is important to encourage continued involvement in similar nature-based activities. Beaumont's results also reveal that environmental interpretation was

[38] Beaumont, "Ecotourism and the Conservation Ethic," 333.
[39] Ibid., 336.
[40] Ibid., 333.

beneficial for individuals who had already demonstrated high levels of environmental concern, especially in the long-term. This finding highlights the presence of a cycling effect through which continued involvement in experiencing and learning about nature serves to strengthen already developed pro-environmental attitudes, values, and behaviors. Therefore, while ecotourism may in fact be "preaching to the converted" it still acts as a positive reinforcing agent.[41]

Conducting research at Rara Avis, an ecolodge deep in the Costa Rican jungle, Ben Sander came to similar conclusions, noting that "environmental knowledge increases greatly in areas in which most ecotourists do not have previous knowledge."[42] Sander administered surveys to guests of Rara Avis both before and after their stays there. After participating in the lodge's interpretive programs, over three-quarters of guests surveyed reported greater environmental awareness, and over two-thirds commented that their knowledge of conservation issues had increased as a result of their stay. Moreover, guests' reported intentions to engage in pro-environmental behaviors also increased, including, among other actions, their willingness to donate money to environmental organizations. This helps perpetuate what Sander calls a cycle of direct-indirect-direct conservation. Rara Avis participates in direct conservation because its property is a private rainforest reserve. Guests who visit indirectly contribute to conservation efforts when, upon returning home, they feel inspired to donate to conservation organizations or write their government representatives about important conservation issues. In fact, after visiting Rara Avis, over 65 percent of Sander's respondents expressed a strong willingness to donate $15-20 to conservation organizations. These indirect actions are again translated into direct

[41] Beaumont, "Ecotourism and the Conservation Ethic," 336.
[42] Ben Sander, "The Importance of Education in Ecotourism Ventures: Lessons from Rara Avis Ecolodge, Costa Rica," *International Journal of Sustainable Society* 4, no. 4 (2012): 401.

conservation when organizations reinvest in conservation and politicians take pro-environmental actions. In this way, the environmental interpretation provided by ecotourism outfitters benefits the entire conservation movement.

Sander asserts that experiential environmental interpretation has an important role to play in ecotourism, remarking, "Between the self-assessment responses and open response questions this study shows that significant knowledge is gained and conservation ethic is improved because of a person's time at Rara Avis."[43] His study demonstrates that ecotourism-based environmental education "can have an impact – especially on the knowledge that people have about the environment and its importance, therefore resulting in a desire to become involved in supporting conservation and the preservation of the environment."[44]

Rethinking Education

It is important to emphasize that in the context of this paper, education does not imply a mere transfer of knowledge (open your brains and say 'Ah!'). In fact, focusing on knowledge gain alone is not a successful strategy for influencing pro-environmental behavior. As mentioned previously, behavior is dictated by a complex interplay of values, attitudes, and social and contextual factors. Hardly surprising then, "most researchers agree that only a small fraction of pro-environmental behaviors can be directly linked to environmental knowledge or environmental awareness."[45] Eschewing a traditional educational setting, interpretative programs should instead focus on "stimulation, provocation, revelation and understanding in a manner that

[43] Sander, "The Importance of Education," 401.
[44] Ibid.
[45] Kollmuss and Agyeman, "Mind the Gap," 250.

personally involves the ecotourist in an interesting and enjoyable fashion."[46] Environmental education in a tourism setting should endeavor to "place emphasis on affective processes and provide opportunities for self-discovery, participation and sensory involvement."[47] Structuring programs this way will have a greater impact on an individual's pro-environmental consciousness, thus yielding greater likelihood of actual behavior change. Designing effective programming, then, can be a challenge, especially in situations where interpersonal contact with a guide may be limited or non-existent.[48] Nevertheless, as the studies presented here reveal, for the sake of achieving a truly sustainable tourism industry, it is a challenge worth pursuing.

Sense of Place + Environmental Concern

> Places shape the stories of our lives.
>
> – Ruth Wilson[49]

> We cannot win this battle to save species and environments without forging an emotional bond between ourselves and nature as well – for we will not fight to save what we do not love.
>
> – Stephen J. Gould[50]

University of Wisconsin geographer Yi Fu Tuan is largely credited with advancing research on place and sense of place with his books *Topophilia* and *Space and Place.* In *Topophilia*, Tuan asserts that at the time, environmental research had largely ignored questions of human values and attitudes, a fact which he considered short-sighted "because man is, in fact,

[46] David Urias and AnnaLisa Russo, "Ecotourism as an Educational Experience" (paper presented at the annual meeting for the Association of International Education Administrators, Atlanta, Georgia, February 24, 2009), 3.
[47] Beaumont, "Ecotourism and the Conservation Ethic," 321.
[48] Urias and Russo, "Ecotourism as an Educational Experience," 3 – 4.
[49] Ruth Wilson, "A Sense of Place," *Early Childhood Education Journal* 24, no. 3 (1997): 194.
[50] Stephen J. Gould, "Unenchanted Evening," *Natural History* September (1991): 14.

the ecological dominant and his behavior needs to be understood in depth."[51] Tuan seeks to deepen the understanding regarding relationships between humans and the environment, theorizing that our lives are shaped by our physical surroundings. He proposes that topophilia, "the affective bond between people and place or setting," influences our attitudes and perceptions.[52]

Since the 1970s, research on "place" has expanded the concept from that of a physical locality to a psycho-social reality. Place, it turns out, is much more complex than mere geographical coordinates. And place scholarship is rife with debate, especially because the research spans academic disciplines from human geography to psychology, sociology, natural resource management, and tourism.[53] With "great diversity in theoretical, methodological, and paradigmatic approaches," place research can be a pretty "messy" affair.[54] Unsurprisingly and equally confusing, definitions for place-related concepts vary across studies and disciplines. Nevertheless, I shall endeavor to sift through the chaos to present a general overview of sense of place and demonstrate how it relates to environmental concern and, of course, skiing.

In a recent journal article, place scholars Joan Brehm, Brian Eisenhauer, and Richard Stedman review the history of sense of place theory, noting, "Early studies argue that positive sentiments tied to a specific physical setting allow people to acquire a sense of belonging to important places. Human geographers have used the term sense of place to describe and explore

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[51] Yi Fu Tuan, *Topophilia* (New York: Columbia University Press, 1974), 2.
[52] Ibid., 4.
[53] Carla K. Trentelman, "Place Attachment and Community Attachment: A Primer Grounded in the Lived Experience of a Community Sociologist," *Society & Natural Resources: An International Journal* 22, no. 3 (2009): 196 – 199. This work gives a thorough description of the contentions surrounding place research.
[54] Ibid., 197.

this attachment and associated meanings."[55] Elsewhere, researchers have argued that "sense of place is based not only on where people are but also on who they interact with and what they do."[56] Thus, sense of place refers to a highly personal and emotional connection with a specific place; it "is not intrinsic to the physical setting itself, but resides in human interpretations of the setting, which are constructed through experience with it."[57] Frequently understood as an overarching concept, sense of place itself is largely considered the sum of two component parts: place attachment and place meaning. [58] (See Figure 1).

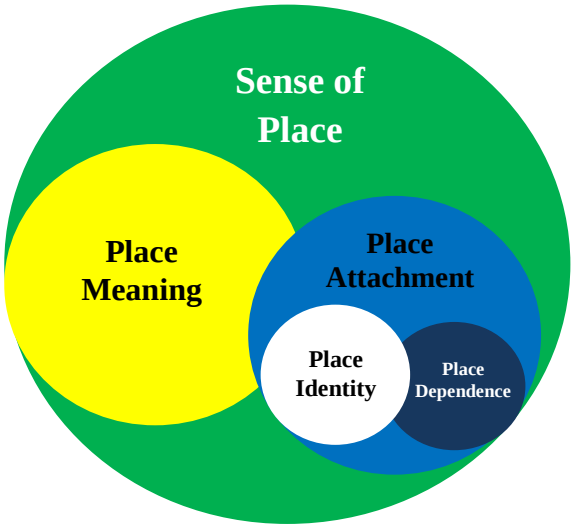

Figure 1. The component parts of Sense of Place.

[55] Joan M. Brehm, Brian W. Eisenhauer, and Richard C. Stedman, "Environmental Concern: Examining the Role of Place Meaning and Place Attachment," *Society & Natural Resources: An International Journal* 26, no. 5 (2013): 523.
[56] Benoni L. Amsden, Richard C. Stedman, and Linda E. Kruger, "The Creation and Maintenance of Sense of Place in a Tourism-Dependent Community, *Leisure Studies: An Interdisciplinary Journal* 33, no. 1 (2010): 33.
[57] Richard C. Stedman, "Is it Really Just a Social Construction?: The Contribution of the Physical Environment to Sense of Place, *Society & Natural Resources: An International Journal* 16, no. 8 (2003): 672.
[58] See Jennifer Farnum, Troy Hall, and Linda Kruger, *Sense of Place in Natural Resource Recreation and Tourism: An Evaluation and Assessment of Research Findings*, General Technical Report PNW-GTR-660 (Seattle, WA: US Department of Agriculture, Forest Service, 2005); Alex Kudryavtsev, Richard C. Stedman, and Marianne E. Krasny, "Sense of Place in Environmental Education," *Environmental Education Research* 18 no.2 (2012): 229 - 250; Carla K. Trentelman, "Place Attachment and Community Attachment: A Primer Grounded in the Lived Experience of a Community Sociologist," *Society & Natural Resources: An International Journal* 22, no. 3 (2009): 196 – 199.

Place Attachment

The concept of place attachment arose in Yi Fu Tuan's *Space and Place.* In it, he writes, "Attachment of a deep though subconscious sort may come simply with familiarity and ease, with the assurance of nurture and security, with the memory of sounds and smells, of communal activities and homely pleasures accumulated over time."[59] Place attachment "refers to the bond between people and places, or the degree to which a place is important to people."[60] Another definition similarly explains that place attachment encapsulates "the meaning places have for people and represents an emotional or affective bond between a person and a particular place."[61] And finally, place attachment has been described as "an emotional or affective bond between an individual and a particular place that may vary in intensity from immediate sensory delight to long-lasting and deeply rooted attachment."[62] There is, after all, a reason Dorothy said, "There's no place like home." Despite its clearly personal nature, place attachment can also be influenced by social relationships through shared experiences. Nevertheless, "even when built upon shared places, people, or experiences, place attachment will be felt and understood differently by different people."[63] Of course, place attachment can also develop based on affinity for the physical aspects of place, whether pertaining to the built or natural environments.[64]

Place attachment can be further broken down into two important component parts: place dependence and place identity. Place dependence "refers to connections based specifically on

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[59] Yi Fu Tuan, *Space and Place: The Perspective of Experience* (Minneapolis: University of Minnesota Press, 1977), 159.
[60] Kudryavtsev, Stedman, and Krasny, "Sense of Place in Environmental Education," 231.
[61] Gerard Kyle et al., "An Examination of Recreationists' Relationships with Activities and Settings," *Leisure Science: An Interdisciplinary Journal* 26, no. 2 (2004): 124.
[62] Daniel R. Williams and Deborah S. Carr, "The Sociocultural Meanings of Outdoor Recreation Places," in *Culture, Conflict, and Communication in the Wildland-Urban Interface*, ed. Alan Ewert, Deborah Chavez, and Arthur Magill (Boulder, CO: Westview Press, 1993), 215.
[63] Amsden, Stedman, and Kruger, "The Creation and Maintenance," 33.
[64] Leila Scannell and Robert Gifford, "The Relations between Natural and Civic Place Attachment and Pro-Environmental Behavior," *Journal of Environmental Psychology* 30 (2010): 290.

activities that take place in an outdoor, recreational setting. It develops out of the fit between one's intended use of an area and the area's ability to adequately provide that use, especially relative to alternative sites."[65] In other words, place dependence reflects "the importance of a resource for providing amenities necessary for desired activities."[66] Thus, many skiers might demonstrate place dependence for snow covered slopes with chairlift access as opposed to slopes without lifts. Moreover, skiers would be more likely to express greater dependence on the ski areas that best suit their needs, which could relate to any number of characteristics from the diversity of terrain, the depth of snow, and the price of a lift ticket, to the quality of the hot cocoa, the ease of accessibility, the friendliness of the staff, the familiarity of an oft visited area, and so on. Notably, the intensity of place dependence is directly related to frequency of visits; the more a person visits a specific site, the stronger his/her sense of place dependence becomes.[67]

Canadian researcher Elizabeth Halpenny explains the relationship between place dependence and place identity, writing, "Extensive interaction with a place due to place dependence may lead to place identity."[68] Place identity, the second element in place attachment, describes "those dimensions of the self that define the individual's personal identity in relation to the physical environment by means of a complex pattern of conscious and unconscious ideas, beliefs, preferences, feelings, values, goals, and behavioral tendencies and skills relevant to this environment."[69] Further elucidated, place identity describes "a relationship in which, through personal attachment to a geographically locatable place, a person acquires a sense of belonging

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[65] Farnum, Hall, and Kruger, *Sense of Place in Natural Resource Recreation and Tourism*, 4.
[66] Kyle et al., "An Examination of Recreationists' Relationships," 124.
[67] Ibid.
[68] Elizabeth A. Halpenny, "Pro-environmental Behaviours and Park Visitors: The Effect of Place Attachment," *Journal of Environmental Psychology* 30 (2010): 410.
[69] Harold M. Proshansky, "The City and Self-Identity," *Environment and Behavior* 10, no. 2 (1978): 155.

and purpose in that place."[70] Therefore, place identity represents the idea that places come to define us and play into the image of ourselves we wish to project to others. Places, thus "offer an individual the opportunity to both express and affirm his/her identity."[71] More poetically, "to be somewhere is to be someone."[72]

Place Meaning

Many researchers echo Tuan's assertion that "what begins as undifferentiated space becomes place as we get to know it better and endow it with value."[73] That is, places are physical spaces that have been "imbued with meaning."[74] Place meaning thus describes "the symbolic meanings that people ascribe to settings."[75] Recreation research has shown that "place meaning often results from the assignment of meaning based on prior use, emotional attachment, and symbolism."[76] Meaning in this sense might include "instrumental or utilitarian values as well as intangible values such as belonging, attachment, beauty, and spirituality."[77] Understanding place meaning is facilitated with the use of an example. Consider the word "home." What is a home? Much more than a physical structure, "when people speak of 'home,' they may not … be referring to a geographic location but to an idea that conveys certain images and sentiments."[78]

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[70] Suzanne Bott, James G. Cantrill, and Olin E. Myers, Jr., "*Place* and the Promise of Conservation Psychology," *Human Ecology Review* 10, no. 2 (2003) 106.
[71] Haywantee Ramkissoon, Betty Weiler, and Liam D.G. Smith, "Place Attachment and Pro-environmental Behaviour in National Parks: The Development of a Conceptual Framework," *Journal of Sustainable Tourism* 20, no. 2 (2012): 263.
[72] Anthony S. Cheng, Linda E. Kruger, and Steven E. Daniels, " 'Place' as an Integrating Concept in Natural Resource Politics: Propositions for a Social Science Research Agenda," *Society & Natural Resources: An International Journal* 16, no. 2 (2003): 90.
[73] Tuan, *Space and Place*, 6.
[74] Cheng, Kruger, and Daniels, " 'Place' as an Integrating Concept," 89.
[75] Kudryavtsev, Stedman, and Krasny, "Sense of Place in Environmental Education," 232.
[76] Jeffrey A. Walsh, "The Value of Place Meaning: Practical Applications for the Future," *Parks & Recreation* 35, no. 8 (2000): 46.
[77] Cheng, Kruger, and Daniels, " 'Place as an Integrating Concept," 89.
[78] Ibid.

Developing a Sense of Place

The literature exploring sense of place generally concludes that the evolution of an individual's sense of place depends upon a few factors. Several researchers propose that place attachment can be developed both directly and indirectly. A person can nurture a burgeoning sense of place via "direct experiences with places, especially long-term, frequent, and positive experiences."[79] The creation of place meaning can be inspired by venturing outside and "experiencing unique attributes of places – including geographical features such as rivers and lakes as well as cultural attractions."[80] However, place attachment need not only develop in situ – it can also emerge by learning about places indirectly, whether through photographs, or sources of written or verbal communication (although the degree of attachment might be weaker).[81]

Both frequency and length of visit are important for cultivating place dependence, place attachment and, subsequently, sense of place. Writing in a US Forest Service research publication, Jennifer Farnum, Troy Hall, and Linda Kruger remark that "sense of place develops as one interacts with a place over time, accumulating and deepening personal meanings, memories, and feelings."[82] Indeed, many studies bolster this assertion. In one example, researchers surveyed over 400 recreational hiking trail users and determined that the frequency "of use of the trail was a significant predictor of their place attachment."[83] Conversely, in a different study, researchers surveyed visitors to a cave in Missouri and determined that visitors' "place attachment was not significantly different before and after a one-time cave tour."[84] This

[79] Kudryavtsev, Stedman, and Krasny, "Sense of Place in Environmental Education," 236.
[80] Ibid., 237.
[81] Ibid.
[82] Farnum, Hall, and Kruger, *Sense of Place in Natural Resource Recreation and Tourism*, 10.
[83] Kudryavtsev, Stedman, and Krasny, "Sense of Place in Environmental Education," 236.
[84] Ibid.

finding further emphasizes the notion that sense of place is mediated and strengthened through meaningful and repeated contact with specific places over an individual's lifetime.

Sense of place does not simply appear; it evolves. Certainly, some initial attraction to a place is necessary to draw an individual back for repeated visits. Farnum, Hall, and Kruger list a number of place-related characteristics that might lure people back for more. These include: "distance, accessibility, type of activities provided, destination image, or social influence."[85] Consider, for example, a family that visits a ski resort for the first time. The children enjoy their lessons in the ski school, the parents find the terrain challenges their abilities without terrifying them, and the après-ski amenities perfectly meet their needs as a family. The vacation is a success. The following year, rather than traveling somewhere new, they might be more inclined to revisit the same ski area. Perhaps the kids loved their ski instructor and are looking forward to returning to ski school. The parents are familiar with the area, which might make them more comfortable traveling. They have favorite restaurants. They know where they want to stay. They know which runs they want to ski. They enjoy the experience enough to return again and again, and the ski area becomes their go-to wintertime family vacation spot. This is the formation of sense of place. It is rather like falling in love.

Environmental Behavior Inspired by Place

Place research now spans forty years, and several studies show that human relationships with place influence behavior, attitudes, and intentions.[86] These relationships motivate us to protect the places most meaningful to us. In 2001, Jerry Vaske and Katherine Korbin published the results of a study in which they surveyed youths working on local conservation projects in

[85] Farnum, Hall, and Kruger, *Sense of Place in Natural Resource Recreation and Tourism*, 31.
[86] Brehm, Eisenhauer, and Stedman, "Environmental Concern," 523.

Colorado. Their results indicate that among their participants, as place dependence increased, so did place identity, resulting in an overall increase in measured environmentally responsible behaviors.[87] Elizabeth Halpenny's 2010 study at a Canadian national park examined the relationship between tourists' and recreationists' place attachment and pro-environmental behavioral intentions. Based on her informants' responses to a mailed questionnaire, she determined that strong levels of place attachment predicted pro-environmental behavioral intentions.[88] Importantly, she comments that her research supports the theory that spill-over effects might exist, noting, "Individuals may transfer the importance they assign to the place they love and value to the more abstract concept of the environment, increasing the possibility of their engagement in environmentally responsible behaviours as a result."[89]

Brehm, Eisenhaur, and Krannich surveyed 566 people residing in rural communities in Wyoming and Utah characterized by local availability of natural amenities and the associated levels of tourism development and in-migration.[90] The researchers do not present a complete demographic breakdown of their survey participants, but do note that they used public utility records to target a representative sample of households within these communities. Measuring the effects of both social and natural attachment, they determine that each separately influences expressed levels of local environmental concern. They conclude:

> Social attachment appears to be an important predictor of local environmental concern when the indicators reflect aspects of the environment that are particularly relevant to community culture or identity, whereas natural environment attachment emerges as an important predictor of local

[87] Jerry J. Vaske and Katherine C. Kobrin, "Place Attachment and Environmentally Responsible Behavior," *The Journal of Environmental Education* 32, no. 4 (2001): 20.
[88] Halpenny, "Pro-Environmental Behaviours," 416.
[89] Ibid., 417. Spill-over effects refers to the practice of transferring behaviors in one setting to another setting. For example, transferring place protective behaviors at a ski resort like Breckenridge and incorporating them into one's normal routine.
[90] Joan Brehm, Brian Eisenhauer, and Richard Krannich, "Community Attachments as Predictors of Local Environmental Concern: The Case for Multiple Dimensions of Attachment," *The American Behavioral Scientist* 50, no. 2 (2006): 148.

> environmental concern when the indicators reflect a focus on protection of the local environment and surrounding landscapes.[91]

In 2010, Leila Scannell and Robert Gifford published the results of their study examining the effects of natural and civic place attachment on pro-environmental behavior. Natural place attachment refers to an attachment to the environmental features local to an area.[92] Conversely, civic place attachment is defined as "group-symbolic place attachment that occurs at the city level."[93] Scannell and Gifford compared residents from two towns in British Columbia, Canada, and found that in both locations, natural place attachment predicted pro-environmental behaviors whereas civic attachment did not.

While the "effects on environmental behaviour may differ depending on the levels and types of place attachment," overall these studies confirm the importance of sense of place and its constituent parts in influencing place protective behaviors, concerns, and intentions.[94]Although none of these studies examined the effects of place attachment at ski areas specifically, the relevance of this research is evident. During the 2011/2012 winter season, 40 percent of the lift ticket revenue for Vail Resorts was earned from the sale of season passes. Vail Resorts touts its season pass program as a way to provide greater economic value for repeat visitors as well as a way to build customer loyalty. This appears to be working, as total season pass revenue increased by 5 percent from the 2010/2011 season to the 2011/2012 season.[95] Presumably, the skiers purchasing season passes will be repeat visitors.[96] While I was unable to find statistics regarding the percentage of repeat visitors from out of state, my own experience as a ski

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[91] Brehm, Eisenhauer, and Krannich, "Community Attachments as Predictors," 161.
[92] Scannell and Gifford, "The Relations between Natural and Civic Place Attachment," 290.
[93] Ibid.
[94] Ramkissoon, Weiler, and Smith, "Place Attachment and Pro-environmental Behaviour," 259.
[95] Vail Resorts, *2012 Annual Report on Form 10-K* (Broomfield, CO: Vail Resorts, 2012), 31 – 32.
[96] A caveat: These numbers are aggregated for all of Vail Resorts' mountain holdings, and therefore Breckenridge is likely to have different numbers. The assumption here is that season pass holders and in-state skiers still make up a large proportion of the skiers at Breckenridge.

instructor leads me to believe that many individuals and families return to ski the slopes of Breckenridge each year. The rate of second homeownership alone is a good indicator that Breckenridge is an annual pilgrimage site for snow worshipers.

What am I getting at with all of this? Given that Breckenridge welcomes return visitors year after year, and given its own company motto, it is probable that both locals and out-of-towners would develop an attachment to the area, especially if the resort fulfills its mission of giving guests the "Experience of a lifetime." Breckenridge is a special place that can inspire place dependence (consistently ranked one of the best ski resorts in North America), place identity ("I am a Breckenridge skier"), place meaning (family, freedom, beauty, nature), and ultimately, place attachment. This notion is supported in the research. One study specifically focused on recreationists determined that, "For all recreationists, as their social ties to the activity grew along with the importance of the activity within the context of their lives, so too did their emotional attachment to the particular setting."[97] Repeat skiers at Breck are likely to develop a sense of place there, which means they are also likely to demonstrate localized environmental protective behavior. With this in mind, the resort's environmental managers could create environmental outreach materials that use sense of place to encourage pro-environmental behavior at the resort. More importantly, although studies on spill-over effects are few and thus far inconclusive, sense of place and its component parts could also be invoked as a way to link behaviors at home with the indirect consequences felt at the alpine home-away-from-home.[98] In this way, sense of place has great potential to be used as a tool to promote awareness and action on environmental issues that impact Breckenridge and the ski industry writ large.

[97] Kyle et al., "An Examination of Recreationists' Relationships," 136.
[98] Ramkissoon, Weiler, and Smith, "Place Attachment and Pro-environmental Behaviour," 268.

Chapter Five

Case Study in the High Country: Breckenridge Ski Resort

The town of Breckenridge lies nestled in the Ten Mile Range, deep within Colorado's Rocky Mountains. Founded in November 1859 during the Colorado gold rush, the town's population boomed and busted along with the gold and silver mining economies. By 1950, mining was no longer a lucrative industry, and the population had shrunk to a mere 295 residents. Ghost town status seemed imminent. But eleven years later, the town experienced a renaissance. In July 1961, the Rounds and Porter Lumber Company of Wichita, Kansas, received a permit to cut a few trails on the slopes of Peak 8. In December, Breckenridge Ski Area opened for its inaugural winter ski season with one double chairlift and a T-bar lift for beginners. Nearly 17,000 skiers visited Breckenridge that year, paying four dollars for an adult lift ticket. [1]

Like many other ski areas across the country, the resort grew rapidly. In 1970, Aspen Skiing Company purchased Breckenridge and expanded the ski area's terrain. Peak 9 opened in 1971 with twelve new trails and two double chairlifts. By 1972 the ski area hosted 271,000 skier visits. New lifts were installed every few years to provide access to new ski trails and to entice more and more visitors. Peak 10 opened in 1985, and two years later skier visits surpassed the one million mark for the first time. Aspen Skiing Company sold Breckenridge to a Japanese company that later sold the resort to Ralston Purina in 1993. A mere three years later, Vail Resorts purchased both Keystone and Breckenridge. In the past ten years alone, the changes at Breckenridge have been astounding. After Peak 7 opened in 2002 with a new lift and seven new intermediate trails, the upgrades kept coming: the Peak8 SuperConnect, the Imperial Express

[1] "Breckenridge Timeline," Breckenridge Heritage Alliance, accessed July 16, 2013, http://breckheritage.com/brecktimeline/.

SuperChair (currently the highest chair lift in North America), the BreckConnect Gondola, and luxury accommodations at the bases of Peaks 7 and 8. More recently, Vail Resorts has undertaken a project to open Peak 6 to skier access, which will add an additional 326 acres to the resort's skiable terrain. From humble beginnings over fifty years ago, this ski area now boasts 155 trails spanning over 2,300 acres of skiable terrain with the lift capacity to whisk 38,000 people per hour up its snowy peaks.[2]

The improvements, however, have not only been limited to the slopes: real estate development has boomed in the town, now brimming with luxury ski-in ski-out condos and hotels, rental homes, second homes, spas, restaurants, bars, and retail. Despite the seemingly rampant resort development, Breck has maintained its character and old-timey Victorian charm, further increasing the small town's appeal. This is a place with nearly everything anyone could possibly want in a ski town. It is little wonder, then, that Breck frequently ranks among the top ten of *Outside Magazine's* yearly list of best ski resorts in North America.[3]

Breck does not score quite as highly on another annual ski resort ranking: the Ski Area Citizens' Coalition environmental scorecard. In fact, Breckenridge Ski Resort is frequently listed among the worst ten resorts on SACC's list. This past 2012/2013 season, Breck managed to beat only Arizona's Snowbowl, decidedly ranking as the second worst resort rated by SACC with an overall score of 50.3 percent, or a D.[4] The SACC report card is divided into four sections: habitat protection, protecting watersheds, addressing global climate change, and environmental policies

[2] "Mountain Information," Breckenridge Ski Resort, accessed July 16, 2013, http://www.breckenridge.com/mountain/mountain-information.aspx.
[3] Avital Andrews, "The 40 Best Ski Resorts in North America," Outside Online, November 5, 2012, accessed July 16, 2013, http://www.outsideonline.com/adventure-travel/north-america/The-40-Best-Ski-Resorts-in-North-America.html.
[4] "Worst Ten," Ski Area Citizens' Coalition.

and practices. In these categories, Breck scored D, D, F, and C respectively.[5] In other words, the resort is failing according to SACC's standards.

It bears mentioning that the SACC report card has been criticized for being too strongly biased against resort expansion.[6] Quoted in an article in the Boulder-based *Daily Camera*, Jennifer Rudolph, a spokeswoman for Colorado Ski Country USA, remarked that she was pleased that resorts are increasingly recognized for their environmental initiatives, but opined that the SACC "scoring system seems flawed, in that I would say that the information they use to base the grades on is often speculative and subjective. . . . For example, they talk a lot about resort's master development plans, and those have to be submitted far in advance for when they might actually happen – if they happen at all."[7] Her allegations are backed up by SACC's own website, which explains that resorts will be docked points for even proposing expansion onto undisturbed land.[8]

Similar criticisms against SACC could be made for Breck's 2012/2013 report card. Breck's construction activities over the past several years are undeniable. There are new lodging and restaurant facilities at the bases of both Peak 7 and 8, and Peak 6 is scheduled to open this upcoming 2013/2014 winter. Nevertheless, the documentation SACC used to substantiate the 2012/2013 grade, while not wholly irrelevant, seems outdated; some sources are as many as ten years old. SACC even states that resorts are not supposed to be penalized once a development project or expansion has been complete for over five years. For example, Breckenridge Ski

[5] "Breckenridge Ski Resort Report Card," Ski Area Citizens' Coalition, accessed July 16, 2013, http://www.skiareacitizens.com/index.php?nav=report_card2&de=25.
[6] Charlie Brennan, "Boulder County's Eldora Ski Areas Earns 'D' from Environmental Coalition," *Daily Camera*, February 2, 2013, accessed July 16, 2013, http://www.dailycamera.com/boulder-county-news/ci_22573734/eldora-ski-area-earns-d-from-environmental-coalition. In the same article an adviser to SACC counters that, "Ski area expansions are far and away the No. 1 impact that an area can have."
[7] Ibid., (includes interview with Jennifer Rudolph).
[8] "How Are Ski Areas Graded?" Ski Area Citizens' Coalition.

Resort received four out of twenty possible points for section 2a, "Maintaining Development within Currently Disturbed Lands." One of the supporting documents provided to justify the score is a public notice for a hearing regarding a potential 256-acre base area development project on both Peaks 7 and 8. The hearing was scheduled for November 7, 2000.[9] Indeed, this development had been planned. But, this is the Cucumber Gulch development project that ran afoul of the EPA and was subsequently denied approval. The base area expansion never happened. Given that much of Cucumber Gulch is now a protected wildlife refuge, this development project is history. Should a ski area continue to be penalized after it has been denied permission for projects in its Master Development Plan? None of this is explained on the report card, which hurts SACC's credibility.

It is important to frankly acknowledge the drawbacks in the rating system's design and implementation when discussing the scores given to each ski area. Nevertheless, the SACC report card is the only third-party assessment currently in use for ski areas, and the organization's rankings do provide valuable insight for comparing resorts, especially when considering the Vail Resorts family of ski areas. Even if the system is flawed, it is noteworthy that Breckenridge is consistently the lowest ranked resort among all of Vail's properties. In 2012/2013, Heavenly and Keystone both earned Cs, Beaver Creek garnered a B, and Vail Mountain surpassed the rest with an A.[10]

Recently, a study published in the journal *Sport Management Review* analyzed ski resort environmental communications (SRECs) for each of the eighty-two resorts graded by SACC and scored the SRECs based on their prominence, breadth, and depth. Breckenridge Ski Resort was

[9] See document 2a, "Breckenridge Ski Resort Report Card," Ski Area Citizens' Coalition.
[10] "Vail Resorts," Ski Area Citizens' Coalition, accessed July 16, 2013, http://www.skiareacitizens.com/index.php?nav=company&company_id=4.

included in this study, and received a C for prominence and an A for both breadth and depth, earning an overall B average. Using the resulting average, the authors of this study compared the resorts' environmental communications with their actual performance based on the SACC grades. In this way, each resort was categorized as inactive, reactive, exploitive, or proactive. An exploitative resort is one that scores well with respect to its environmental communications, but scores poorly according to SACC's judgment of its actual performance. In this study, Breckenridge Ski Resort was classified as an exploitive resort. So were Keystone, Heavenly, and Beaver Creek. Vail Mountain, notably, received this study's best rating. Its SRECs and SACC scorecard both earned top marks, placing Vail in the "proactive" category (using SACC's most recent report card, Beaver Creek would now also be classified as proactive).[11] Whereas a proactive resort is one which apparently holds environmental performance as a priority, exploitive resorts "exploit consumer interests in environmentally friendly products without considerations of resource characteristics, environmental ethics or a long-term perspective."[12] Thus, after analyzing its online communications and its SACC score, Breckenridge Ski Resort appears to talk the talk, but does not walk the walk. To some, this might reek of greenwashing.

Notes from the Slopes: Breck's Eco-Agenda

In March 2013, I met with Breckenridge Ski Resort's Environmental Coordinator, Ray Weller, to see what he could tell me about the resort's eco-efforts. Despite consistently receiving paltry scores from SACC, Breckenridge Ski Resort does have an active environmental program that addresses a host of issues. Weller essentially repeated most of what already appears on the

[11] Spector et al., "Socially Constructed Environmental Issues and Sport."
[12] Simon Hudson and Graham Miller, "The Responsible Marketing of Tourism: The Case of Canadian Mountain Holidays," *Tourism Management* 26 (2005): 134.

Vail Resorts Echo environmental stewardship webpages.[13] He related that the resort does a "ton of little things that keep adding up" to greater sustainability, but these projects are dispersed across the resort and are not obvious to the public eye.[14] Ticking off some of the resort's efforts, he touted the resort's waste diversion program for recycling and composting, the upcoming zero-waste campaign, the energy efficiency projects, the wind and solar energy project for the patrol hut at the top of the Imperial Express chair, the green buildings, the company-wide goal to reduce energy usage 20 percent by 2020 (In 2010, Vail Resorts had already reduced its energy usage 10 percent using 2008 as the baseline).[15]

In 2009, Vail unveiled "Vail Resorts Echo," the company's renamed and revamped environmental, community, and social responsibility program. Echo is the public face for these initiatives, and the website gives all the requisite statistics for gallons of water and kilowatt hours of energy saved, tons of waste recycled or composted, green buildings built, and so on. Notably, through the Echo program, Vail involves the community in stewardship projects. Every year, Breck sponsors a Mountain Clean-Up Day for employees and community members to get together and comb the slopes, picking up any trash uncovered by the spring snowmelt.[16] The company also donates money to a number of local non-profits each year. And, Vail Resorts recently donated $750,000 and over 2,000 volunteer hours to a forest fire restoration project. As Weller told me, "We are trying to do the right thing."[17] That being said, I uncovered some flagrant greenwashing regarding the recent rehabilitation of a beaver pond in Cucumber Gulch as well as the misrepresentation of renewable energy credits. Situations like these make one wonder

[13] Ray Weller, interview by author, Breckenridge, March 12, 2013.
[14] Weller, interview.
[15] Incidentally, I have not seen compost containers in the dining areas, which leads me to speculate that only kitchen waste is composted.
[16] "Sustainable Operations," Vail Resorts ECHO, accessed July 30, 2013, http://www.vailresortsecho.com/stewardship/resource-conservation.aspx.
[17] Weller, interview.

if all the sustainability talk is truly an ingrained ethos. As Shelly Grail, Forest Service Ranger from the local Dillon Ranger District confided, sometimes the Forest Service has to force environmental stewardship on the resorts.[18] Despite this, I am willing to admit that Breck is heading in a good direction, at least as far as operations go.

Researching sustainability projects was enlightening, but my main task was to learn more about the environmental outreach that takes place on the slopes. Both the Vail Resorts Echo and Breckenridge Ski Resort's websites advertise the "Ski with a Ranger" program, in which skiers and riders learn about ecology, wildlife, local history, and resort environmental programs while touring the slopes with a Forest Ranger.[19] Grail told me that the program is growing in popularity, but it is mostly attended by locals or people who take longer vacations.[20] Despite its increasing popularity, Breck only hosts "Ski with a Ranger" once a week for an hour-long session. Moreover, "Ski with a Ranger" is the only educational offering available at Breckenridge, although the Echo website does include a few more ways guests can get involved with "the VR Echo experience."[21] These include hosting a green conference, throwing a green wedding, or golfing on Audubon Society certified golf courses. Season pass holders are invited to donate a dollar to the National Forest Foundation.

Weller did tell me about Epic Discovery, one of Vail Resort's newest projects. Though still awaiting Forest Service approval, Epic Discovery will be a "comprehensive summer activities plan" that Vail Resorts intends to develop at Vail Mountain, Breckenridge, and Keystone. The press release explains that the Epic Discovery programming will encourage

[18] Shelly Grail, interview by author, Breckenridge, March 12, 2013.
[19] "Ski with a Ranger Tour," Breckenridge Ski Resort, accessed July 31, 2013, http://www.breckenridge.com/mountain/environment/ski-with-a-ranger.aspx.
[20] Grail, interview.
[21] "Guest Involvement," Vail Resorts Echo, accessed July 31, 2013, http://www.vailresortsecho.com/stewardship/guest-activities.aspx.

"'learn through play' by featuring extensive environmental educational elements interspersed between numerous new fun activities located in already developed areas of the mountain." The release continues: "Epic Discovery is designed to connect kids and families with our national forests in an active, fun, and engaging way."[22] There are plans for new hiking and biking trails, zip lines and ropes courses, and, refreshingly, environmental interpretation. The company has even teamed up with The Nature Conservancy to help develop the interpretation materials. Furthermore, Vail Resorts "will donate 1 percent of all summer activity revenue to the Nature Conservancy for forest health restoration projects out west."[23]

Skiers, Riders, and their Environmental Worldviews

The second component of my field-work involved conducting skier surveys. I spent a week administering surveys to forty-six willing participants recruited in public spaces around Breckenridge, Colorado (a more detailed methodology is given in the Introduction). Because describing the results of all forty-two questions would be an exhausting task, I have chosen to present only the most relevant outcomes here.

Demographics

Respondents to the survey included both Breckenridge residents and non-residents. Overall, twenty-five participants reported living in Breckenridge. Twenty respondents were from other locations throughout Colorado or from out-of-state. One individual did not provide his current place of residence. Fifteen respondents were female; thirty-one were male (or, 32.6

[22] "Vail Resorts Introduces Epic Discovery, a Summer Mountain Adventure at Breckenridge Ski Resort," Vail Resorts press release, March 29, 2013, accessed July 31, 2013, http://www.epicdiscovery.com/assets/Breck_PressRelease.pdf.
[23] "Epic Discovery," Vail Resorts, accessed July 31, 2013, http://www.epicdiscovery.com/breckenridge/.

percent female, 67.3 percent male). While this is obviously an unequal representation, it is not too far skewed from the 2012/2013 gender divide among US skiers and snowboarders reported by the trade group SnowSports Industries America (40% female, 60% male).[24] Nearly all of the respondents identified as non-Hispanic whites. One was Asian-American, and one wrote in "European." Fifty-four percent had college degrees, and another 26 percent had received Associate's Degrees or had completed some college. Six respondents had obtained education beyond a Bachelor's Degree.

Attachment to Breckenridge

Only four respondents had never been to Breckenridge before. Thirty people indicated that they ski at the resort at least once a month or more. Moreover, nearly 72 percent of the individuals surveyed indicated that they feel an emotional attachment to Breckenridge.

Environmental Views and Behaviors

NEP scores ranged from a minimum of thirty-nine to a maximum of fifty-seven. However, the average NEP score for the entire survey group was 49.2, which indicates that, in general, the participants tend toward pro-environmental world views. Interestingly, when asked whether or not they consider themselves environmentalists, 31 percent either agreed or strongly agreed and 53 percent were unsure. Eleven percent disagreed and the remaining five percent strongly disagreed. See Figure 2 for the complete breakdown. When NEP scores were analyzed separately, self-professed environmentalists had an average NEP score of 49; those who were unsure had an average score of 50; and those who did not consider themselves environmentalists

[24] "2013 SIA Snow Sports Fact Sheet," SnowSports Industries America.

had an average score of 47.6.[25] Even then, confirmed environmentalists, uncertain environmentalists, and non-environmentalists all had average NEP scores that favored pro-environmental world views.

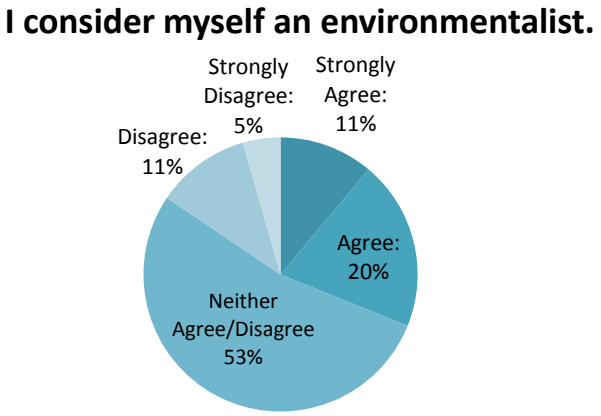

Figure 2. Survey responses to the statement, "I consider myself an environmentalist."

Participants were also asked to check boxes indicating adoption of several pro-environmental behaviors: recycling, composting, using alternative modes of transportation, making an effort to drive less, turning off lights in empty rooms, shopping for eco-friendly products, and avoiding out-of-season foods. The vast majority of respondents indicated that they engage in at least one of these environmentally friendly behaviors. Certain trends appear when these reported behaviors are compared with the individuals' self-evaluation of "environmentalism."[26] Of the seven individuals who do not consider themselves environmentalists, two engaged in only one pro-environmental behavior; two respondents

[25] The average NEP score for the environmental group would be higher but for one individual who took issue with several of the NEP statements, and therefore did not select any of the five answer options. His score was also tied for lowest NEP score of the group. Without taking his responses into account, the environmentalist group average rises to 49.6.

[26] For the purposes of this analysis, individuals who strongly agreed or agreed with the statement, "I consider myself an environmentalist" were grouped together. The same grouping was made for individuals who either disagreed or strongly disagreed.

selected two behaviors; and two reported engaging in three or more pro-environmental behaviors. One person did not respond. Among the unsure environmentalist group, one person did not engage in any behaviors; two individuals indicated participation in one behavior; four people reported engaging in two behaviors, and seventeen indicated that they participated in three or more pro-environmental behaviors. Lastly, the environmentalist group was comprised of fourteen people. One marked only one activity, while the thirteen remaining participated in three or more pro-environmental behaviors. These results are summarized in Table 1.

Table 1. Participation in pro-environmental activities separated by affiliation with environmentalism

Pro-Environmental Behavior Participation	0 behaviors	1 behavior	2 behaviors	3+ behaviors
Environmentalists	0	1	0	13
Unsure Environmentalists	1	2	4	17
Non-Environmentalists	1	2	2	2

Breckenridge Environmental

Participants were asked if Breckenridge had environmental programs, although the question did not specify what these programs would be. Sixty-one percent of the respondents said yes, and 39 percent were unsure. When asked if Breckenridge had recycling containers, 61 percent answered yes and reported using these containers to dispose of their recyclables. Four percent said they were aware that the containers existed but did not use them. Finally, 33 percent were unsure whether the resort had recycling bins or not. One person did not select a response.

In order to measure willingness to engage in environmental issues at the resort, respondents were asked if they would support increased environmental programing. Sixty-three

percent said yes, 30 percent said they were unsure, and only 4 percent said no. One person did not answer. Participants were then asked if they would pay to offset the greenhouse gas emissions caused by their travel to Breckenridge, provided the resort offered an incentive to do so. Forty-two percent said yes, and 30 percent said that it would depend on the incentive offered. Thirteen percent were unsure, and another thirteen percent said no. One person did not respond. Finally, respondents were asked if they would pay 1% more for a lift ticket if that money were donated to an environmental organization or program. Exactly half replied that they would. Twenty-four percent said it would depend on the organization, and 9 percent were unsure. The remainder said no.

Climate Change

Participants were asked to give their opinions regarding the statement, "In my opinion, climate change is a pressing concern for our country." Overall, 65 percent of the respondents either agreed or strongly agreed with this statement. Eighteen percent neither agreed nor disagreed, and 8 percent disagreed or strongly disagreed. When asked whether or not they were concerned about the impacts climate change could have on the ski industry, 76 percent said yes, 4 percent was undecided, and 20 percent said no.

Chapter Six

Ski Areas as Environmental Educators and Climate Activists

Although my sample size was small and biased towards residents, overall, my survey results demonstrate that skiers and riders at Breckenridge care about the environment and want to do what they can to minimize their impacts on it. With an average NEP score of 49.2, these individuals demonstrated that they were a fairly environmentally minded group, despite expressing uncertainty about labeling themselves environmentalists. Moreover, their professed willingness to support and participate in increased environmental programming at the resort, to offset emissions, and to pay an extra dollar for a lift ticket in donation to environmental groups indicates openness to engage more deeply with the resort on environmental issues.[1]

Research shows that "environmentally friendly tourists exist in all tourism contexts and could be actively targeted as market segments to reduce the ecological footprint of tourism."[2] Indeed, Weller says their guests are highly interested in sustainable operations. In fact, a survey of US travelers conducted by *National Geographic Traveler* and the Travel Industry Association of America found that "nearly three quarters of all travelers claim that it is important to them that their visit not damage the environment."[3] Moreover, nearly 40 percent indicated willingness to pay more for travel services offered by companies that protect and preserve local environments.[4] With beautifully marketed programs like Vail Resorts Echo, Epic Discovery, and all of the important sustainability initiatives at each of the resorts, it is obvious that Vail Resorts

[1] Hot chocolate, buttons, and getting first chair were suggested as incentives that motivate generous environmental donations.
[2] Sara Dolnicar and Friedrich Leisch, "An Investigation of Tourists' Patterns of Obligation to Protect the Environment," *Journal of Travel Research* 46 (2008): 382.
[3] Travel Industry Association of America, *Geotourism: The New Trend in Travel* (Washington, DC: Travel Industry Association of America, 2003), 3.
[4] Ibid., 5.

recognizes the marketability of sustainability, although both Weller and Grail told me that Vail Resorts needs to do a better job of publicizing Echo. Presently, however, guest involvement at Breck remains superficial. The resort could do more, and increasing environmental interpretation and communications would be a great step towards engaging people with the natural world.

Largely considered the most effective means of communication in leisure settings, the goal of interpretation is to influence visitors' environmental consciousness.[5] Indeed, Ewert, Place, and Sibthorp contend, "One of the hallmarks of many recreation and leisure service organizations offering programs in the outdoors is the belief that these programs serve to strengthen and enhance a participant's sense of responsibility and attitude toward the natural environment."[6] Moreover, Ramkissoon, Weiler, and Smith report that in the context of national parks, "Encouraging environmentally responsible behaviours by visitors is now an important strategy for promoting sustainability and thus long-term benefits for the tourism industry."[7] And, according to a guide on effective interpretation, "Good interpretation encourages a greater sensitivity to one's surroundings, a heightened ecological and cultural awareness, and a meaningful link to the past and future."[8]

As we have observed, environmental education programs directed towards tourists can inspire pro-environmental behaviors on-site and, in some cases, beyond. This achievement, however, is easier said than done. Introducing his research on environmental interpretation at a wildlife center in Australia, Mark Orams cautions the reader against assuming that interpretation necessarily leads to behavior change. He writes:

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[5] Peake, Innes, and Dyer, "Ecotourism and Conservation," 108.
[6] Alan Ewert, Greg Place, and Jim Sibthorp, "Early-Life Outdoor Experiences and an Individual's Environmental Attitudes," *Leisure Sciences* 27 (2005): 225.
[7] Ramkissoon, Weiler, and Smith, "Place Attachment and Pro-environmental Behaviour," 260.
[8] Larry Beck and Ted Cable, *Interpretation for the 21st Century: Fifteen Guiding Principles for Interpreting Nature and Culture* (Champaign, IL: Sagamore Publishing, 2002), 3.

> A common assumption made by many in the nature-based tourism industry is that through interaction with nature, environmental awareness and responsibility in participants is created. A second common assumption is that through improving an individual's level of knowledge by means of an education programme, somehow — magically — a change in attitudes and behaviour regarding the subject matter is induced. In reality this is seldom, if ever, the case. It is both logical and obvious that if an education programme does not deliberately set out to change attitudes and behaviour it is extremely unlikely to do so.[9]

These assertions make sense in light of research investigating the reasons for individuals' environmental attitudes and behaviors. Turning once again to Ewert, Place, and Sibthorp, these researchers explain that the way in which an "an individual perceives the world is multi-dimensional and involves a variety of attitudes and individual perceptions based on personal experiences. Often, these perceptions can influence a person's attitudes and subsequent behaviors toward the natural environment."[10]

Thus, in order to promote behavior change, we must first understand the influences behind our behaviors. According to Brownlee, Powell, and Hallo, "Researchers have long cited values, attitudes, and beliefs as the most salient antecedents of behavioral intentions and ensuing behaviors."[11] Two commonly cited frameworks that endeavor to explain the relationship between these concepts include the values-beliefs-norms framework and the Theory of Planned Behavior. The values-beliefs-norms theory hypothesizes that an individual's "values, attitudes and beliefs precede social norms and responsibility, and ultimately influence behaviors."[12] The Theory of Planned behavior suggests that beliefs influence attitudes about specific behaviors and their outcomes. Attitudes in turn influence the intention to act out on these behaviors.[13] These two

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[9] Orams, "The Effectiveness of Environmental Education," 297.
[10] Ewert, Place, and Sibthorp, "Early-Life Outdoor Experiences," 226.
[11] Matthew T.J. Brownlee, Robert B. Powell, and Jeffery C. Hallo, "A Review of the Foundational Processes that Influence Beliefs in Climate Change: Opportunities for Environmental Education Research," *Environmental Education Research* 19, no. 1 (2013): 2.
[12] Ibid.
[13] Ibid.

models are similar, because they each begin with the premise that underlying beliefs or values influence attitudes, which ultimately affect the desirability of our actions.

In a 2005 article, social psychologist Wesley Schultz demonstrated that environmental attitudes can be divided into three separate categories: "biocentric concerns focus on all living things (plants, marine life, birds, animals), altruistic concerns focus on other people (people in my community, children, all people, my children), and egoistic concerns focus on the self (my health, my future, my lifestyle, me, and my prosperity)."[14] Examining these categorizations, Schultz argued that "environmental concerns are rooted in a person's interconnection with other people and with the natural environment."[15] Therefore, he concluded that just as two people can deepen their relationship with one another, an individual can also deepen his or her relationship to the natural environment.[16] This finding has encouraging implications for environmental interpretation programs. Activities that seek to reduce the "perceived separation between self and nature will lead to an increase in that individuals' biospheric concern."[17]

Harkening back to Orams's research, it is evident that environmental education programs for tourists must be carefully designed if they aim to influence attitude and behavior change. His framework, which I briefly outlined in Chapter Four, provides a useful starting point for the development of educational programs targeted at tourists, especially because it is grounded in educational psychology. Thus, any interpretation programs offered to visitors of Breckenridge Ski Resort should employ a variety of communication techniques in order to encourage curiosity and welcome questions about the natural world. They should engage visitors' emotions. Orams

[14] P. Wesley Schultz, "Empathizing With Nature: The Effects of Perspective Taking on Concern for Environmental Issues," *Journal of Social Issues* 56, no. 3 (2000): 401.
[15] Ibid., 402.
[16] Ibid.
[17] Ibid., 403.

contends that when emotions are stirred, messaging is more effectively internalized and therefore more likely acted upon. Importantly, these experiences should endow tourists with the motivation to act on "specific environmental problems/issues or themes that are relevant to the tourism experience," giving participants a sense of ownership over these issues.[18] This assertion is backed up by the research of Peake, Innes, and Dyer, who note that "guide-suggested conservation action" is extremely important for achieving successful environmental messaging.[19] Beyond suggesting action, tourists should actually be given the opportunity to act. According to Orams, "this stage is extremely important; most participants in nature-oriented tourism programs have good intentions. However, after they leave those intentions may not result in changed behaviour. By providing opportunities for participants to take action, effective behavior change can be prompted 'on the spot'."[20] These invitations to act can be as simple as signing a petition or a pledge, or even purchasing eco-friendly souvenirs. Lastly, participants should be encouraged to provide feedback on the program. Of course, not all educational components must be interpersonal. A nature center can offer interpretation using exhibits as well. Photos, objects to touch and observe, audio recordings, and signs can all be used to tell stories and involve people in the surrounding environment.

Forest Ranger Shelly Grail wishes Breckenridge had an environmental education center. She added, "My dream is an environmental education center at all the ski areas."[21] In fact, Vail Mountain does have an environmental education center on its slopes, which is run cooperatively by the Vail-based Walking Mountains Science Center, the US Forest Service, and Vail Mountain. The Nature Discovery Center at Vail Mountain offers hour-long nature hikes twice

[18] Orams, "The Effectiveness of Environmental Education," 298.
[19] Peake, Innes, and Dyer, "Ecotourism and Conservation," 120.
[20] Orams, "The Effectiveness of Environmental Education," 298.
[21] Grail, interview.

daily in the summer. In the winter, these hikes become snowshoe tours. Furthermore, the Center hosts family programs in the evenings and provides lessons for ski school classes. Between June 2011 and July 2012, nearly 23,000 people visited the Center to participate in these programs and learn about mountain ecology from staff naturalists.[22]

Similar to Vail's Nature Discovery Center and its parent organization, Walking Mountains Science Center, the city of Aspen is home to an environmental education center, whose mission is "to inspire a life-long commitment to the Earth by educating for environmental responsibility, conserving and restoring the balance of natural communities, and advancing the ethic that the Earth must be respected and nurtured." Through visiting the Aspen Center for Environmental Studies, guests of Aspen's four resorts have access to environmentally themed classes for children, youth, and adults, winter snowshoe tours, and summer hikes. The diversity of programs offered at these two institutions indicates an understanding of the myriad ways in which to engage the public with environmental issues. While I am not aware of any studies examining the effectiveness of the programming offered by these natural science centers, Orams lists five indicators that could be measured in order to determine the strengths, weaknesses, successes, and failures of these programs.

The environmental education centers at both Vail Mountain and Aspen/Snowmass demonstrate that world-class ski resorts can incorporate interpretation, and guests will respond positively. The statistics presented by the Travel Industry Association of America are a good indicator that sustainable tourism is both desirable and profitable. Borrowing from the framework created by Vail's Nature Discovery Center and incorporating Orams's research,

[22] Walking Mountains Science Center, *Annual Report, 2012* (Avon, Co: Walking Mountains Science Center, 2012), 3.

Breckenridge could create its own nature center to offer as yet another amenity to the ski area's visitors.

Programs like these are important because they enhance individuals' overall environmental understanding and consciousness. This impact is made even more profound by research which has shown that "environmental beliefs and worldviews mediated the effect of values and other factors in explaining the support for climate-friendly action."[23] Moreover, interactive environmental experiences are especially important for children. Studies have found that most self-described environmentalists attribute their attitudes and beliefs to "informal outdoor experiences and experiences of natural areas" during childhood.[24] Family members and trusted adults who encourage respect for nature also play an important role.[25] More recently, Ewert, Place, and Sibthorp confirmed these findings and also emphasized the influence of peers.[26] By incorporating environmental education and interpretation programs, resorts like Breckenridge nurture connections with nature that can lead to increased pro-environmental behaviors. Adopting Orams's strategies from educational psychology, they can challenge pre-conceived environmental beliefs. Furthermore, by actively engaging guests with the intricacies of place, these techniques are drivers of place attachment, which is, as it turns out, key to effectively engaging people with climate change.[27]

One might wonder why a ski resort should care about fostering its guests' sense of place and environmental attitudes and behaviors. The answer is, quite simply, because their future success depends on it. Environmental problems are largely human problems. If interpretation

[23] Annukka Vainio and Riikka Paloniemi, "Does Belief Matter in Climate Change Action?" *Public Understanding of Science* 22, no. 4 (2011): 384.
[24] Chawla, "Life Paths," 25.
[25] Ibid., 19.
[26] Ewert, Place, and Sibthorp, "Early-Life Outdoor Experiences," 235.
[27] Kudryavtsev, Stedman, and Krasny, "Sense of Place in Environmental Education," 236.

programs can inspire individuals to rethink their actions, to encourage pro-environmental attitudes and behaviors, then we can begin to lessen our individual impacts on the environment. Certainly, this is a noble cause for a nature-based industry. However, if this engagement remains limited to wildflowers, wildlife, and the importance of ecosystems, it will not be enough to address the proverbial elephant-in-the-room that is now careening down the slopes. Vail Resorts, and ski areas in general, needs to educate visitors about climate change. More than that, the company should *market* climate change advocacy. This may seem anathema for a leisure company that would rather focus on fun than politics, but ski resorts are advantageously positioned to advocate for meaningful climate action.

Sustainable Slopes and Beyond

In a July 2013 article on the Network for Business Sustainability website, Harvard Business School professor Dr. Michael Toffel and Aspen Skiing Company's Auden Schendler argue that sustainable operations have gone mainstream for corporations, which is certainly commendable. However, corporate greening will never be enough to achieve true sustainability because it does not address the scale of the problem.[28] For that to happen, "companies must become activists."[29] In this spirit, Toffel and Schendler define four steps companies can take to lead on climate change. These include lobbying government for legislation to limit greenhouse gas emissions, insisting that trade groups do the same, requiring that supply chains also work to cut their emissions, and lastly, marketing these actions so that "customers and suppliers appreciate their leadership."[30] Toffel and Schendler speculate that one of the reasons more

[28] Michael Toffel and Auden Schendler, "'Greening is Not Enough': 4 Steps to Corporate Leadership on Climate Change," *Thought Leaders* (blog), *Network for Business Sustainability* July 8, 2013, accessed August 7, 2013, http://nbs.net/greening-is-not-enough-4-steps-to-corporate-leadership-on-climate-change/#.UfAbICN2GXM.twitter.
[29] Ibid.
[30] Ibid.

companies are not actively engaging in climate is because they "make their money selling their products and services, and tend to avoid distractions from that key mission. Climate is seen as secondary in importance, global in scale, and a future risk."[31]

Obviously a climate dependent industry like the ski industry should be actively engaging in all four of these recommendations. In fact, Vail Resorts has joined Aspen and a number of other ski areas to voice support of climate policy. But it is the last step that Toffel and Schendler mention, the public face of corporate climate activism, that I would like to focus on. Back in 2009 when Vail Resorts issued a press release heralding the introduction of Vail Resorts Echo, CEO Rob Katz commented, "But even more important, it's the impact our actions and behavior can have with our guests and our communities as we look to stake out leadership positions on important issues. . . . It is our hope that Vail Resorts ECHO continues to reverberate positively in the places where we live, work and play for generations to come." Katz is correct. As one of North America's largest and most recognized ski companies, "the premier mountain resort company in the world" according to its website, Vail Resorts can have a major impact on its guests and communities, other ski resorts, and even politics.[32] Previously, Katz has spoken out on climate change, urging people to "keep the focus where it belongs and encourage everyone to do their part to reduce greenhouse emissions: not to save their favorite ski run, but to save the planet for our children and grandchildren."[33] With this position, he is missing an opportunity to reframe the climate debate. Aspen Skiing Company has long been in the forefront of sustainability and climate advocacy; the list of sustainability measures the company has adopted is astounding. Even more impressive is the fact that it honestly admits having made mistakes in

[31] Toffel and Schendler, "'Greening' is Not Enough."
[32] "Who We Are," Vail Resorts, accessed August 7, 2013, http://www.vailresorts.com/Corp/info/who-we-are.aspx.
[33] Rob Katz, "Skiing Won't Be Greatest Loss After Climate Change," *Denver Post*, December 23, 2012, accessed January 23, 2013, http://www.denverpost.com/opinion/ci_22235458/skiing-wont-be-greatest-loss-after-climate-change.

this quest. Certainly Aspen is not the only ski company to embark upon this mission, but its voice is the loudest. If it wanted, Vail Resorts could change tactics and join Aspen to become a bold leader on climate advocacy. So could any resort, but they must be willing to drop the pretense and get real about the future of skiing.

Skiing in the Time of Climate Change

According to the findings of a nationally representative survey conducted in April 2013 by the Yale Project on Climate Change Communication and the George Mason University Center for Climate Change Communication, 63 percent of Americans believe climate change is occurring.[34] A little more than half are worried about what a climate changed future might bring.[35] In my own survey, 65 percent of the respondents either agree or strongly agree that climate change is a pressing concern for our country. Moreover, 76 percent are worried about the impacts climate change could have on the ski industry. Interestingly, over 50 percent of my survey-takers were not sure if they would label themselves environmentalists, which means that one does not have to be a self-described environmentalist to be concerned about climate change.

Yet, there is a gap between what people believe and what they believe they can do. As many researchers note, the trouble with climate change is that it is perceived a far-away, global problem, which can lead individuals to feel as though their own actions have no impact or import.[36] Schweizer, Davis, and Thompson posit that "without an understanding of what to do,

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[34] Anthony Leiserowitz et al., *Climate Change in the American Mind: Americans' Global Warming Beliefs and Attitudes in April, 2013,* Yale University and George Mason University (New Haven, CT: Yale Project on Climate Change Communication, 2013), 4.
[35] Ibid., 8.
[36] See Matthew T.J. Brownlee, Robert B. Powell, and Jeffery C. Hallo, "A Review of the Foundational Processes that Influence Beliefs in Climate Change: Opportunities for Environmental Education Research," *Environmental Education Research* 19, no. 1 (2013): 1 – 20; Leila Scannell and Robert Gifford, "Personally Relevant Climate Change: The Role of Place Attachment and Local Versus Global Message Framing in Engagement," *Environment*

individuals are left feeling overwhelmed and frightened, or blissfully ignore the magnitude of the issue through denial."[37] This is precisely where ski areas can step in to lead on climate advocacy. Because of its status and because climate change threatens to virtually end skiing within the next ninety years, Vail Resorts has the potential to influence people's perceptions on climate change; it can take what is still an abstract global issue and bring it to a level that people relate with. Vail can and should transform climate change into a ski issue.

The key to this transformation is place attachment. Brownlee, Powell, and Hallo explain that "if an individual's 'special place' is perceived as influenced by climate, their beliefs about the occurrence of climate change may be altered."[38] Similarly, in a recent study examining the relationship between climate change and place attachment, Leila Scannell and Robert Gifford found that "climate change engagement was greater among those who were more attached to their local areas."[39] Furthermore, Hess, Malilay, and Parkinson assert:

> A focus on place emphasizes the local nature of both exposure and response, and it brings attention to environmental changes where the motivation to address them is strongest: Emphasizing place highlights climate change's effects where they are most acutely felt, where local strengths are best understood, where place attachment can be leveraged most effectively, and where residents will reap the benefits of adaptive measures promoting sustainability and livable communities.[40]

When individuals realize that this global phenomenon has local consequences, the risks become more apparent, and they are more motivated to act. Thus, personal relevancy to the issue creates

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and Behavior 45, no. 1 (2013): 60 – 85; Annukka Vainio and Riikka Paloniemi, "Does Belief Matter in Climate Change Action?" *Public Understanding of Science* 22, no. 4 (2011): 382 – 395.

[37] Sarah Schweizer, Shawn Davis, and Jessica L. Thompson, "Changing the Conversation about Climate Change: A Theoretical Framework for Place-Based Climate Change Engagement," *Environmental Communication: A Journal of Nature and Culture* 7, no. 1 (2013): 44.

[38] Brownlee, Powell, and Hallo, "A Review," 7.

[39] Scannell and Gifford, "Personally Relevant," 76 – 77.

[40] Jeremy J. Hess, Josephine N. Malilay, and Alan J. Parkinson, "Climate Change: The Importance of Place," *American Journal of Preventive Medicine* 35, no. 5 (2008): 476.

a link between action and inaction.[41] We know that skiers and riders are likely to become attached to those ski areas in which they recreate on a regular basis. The next logical step, then, is for these areas to communicate the personal relevancy of climate change to these individuals.

A Framework for Ski Area Climate Advocacy

How does Vail Resorts, or, indeed, any ski area, effectively communicate this link to skiers and riders? The strategy is twofold: through interpretation and communications campaigns. In this section, I shall address each of these techniques in turn and explain how they could be implemented in order to engage visitors with climate change without uncomfortably politicizing the issue.

Climate Interpretation

I have already discussed the importance of environmental interpretation for promoting pro-environmental attitudes and behaviors and sense of place. Interpretation can also be used, however, for effective climate communication. A recent study on visitors to US national parks and wildlife refuges found that climate change messaging has a greater impact when it is "integrated with the experiential meaningfulness of place."[42] Therefore, any ski resort-based environmental education center should include programming not only on natural history and ecology, but also on climate change. Just as general environmental interpretation needs to be thoughtfully designed in order to promote attitude and behavior change, so also must climate interpretation. In addition to incorporating the five techniques outlined by Orams, purposefully addressing the barriers to climate action will increase the effectiveness of this outreach.

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[41] Scannell and Gifford, "Personally Relevant," 76 – 77.
[42] Schweizer, Davis, and Thompson, "Changing the Conservation," 43.

We know that climate change seems rather nebulous and far-away to many people. Climate information must therefore be made personally relevant and should focus on the possible changes at the local level. Using Colorado as an example, interpretive activities could highlight the impacts on wildlife, the concept of island biogeography as it relates to high alpine environments, the current mountain pine beetle epidemic (largely attributed to warming winters), the increased variability in precipitation, the likelihood of dwindling snowpack, and the availability of water for snowmaking and, more importantly, for drinking water supply. Information on local impacts could be pulled from institutions such as the City of Aspen's Canary Initiative, the National Park Service and Rocky Mountain National Park, and the Forest Service's Climate Change Resource Center. Furthermore, collaborating with the Forest Service and other local environmental groups could help to narrow the range of topics to present.

Because climate change can be challenging to comprehend, various methods should be employed for effective communication. Although it might be meaningful to discuss the effects and causes of the mountain pine beetle outbreak right on the red-needled slopes of Colorado's ski resorts, changes in vegetation or snow cover could be more difficult to visualize. However, Schweizer, Davis, and Thompson state that "many people need to see the effects of climate change before they can believe it is real and make sustainable decisions and behavioral changes."[43] Thus, effective communication should involve the use of "time-lapsed photography, photo simulations, or historical photos of landscape change" in order to aide audiences in imagining and visualizing the effects of climate change. The more vivid, concrete, and personal the information, the better.[44] Furthermore, climate communication should appeal to our brains'

[43] Schweizer, Davis, and Thompson, "Changing the Conservation," 59.
[44] Doug McKenzie-Mohr, *Fostering Sustainable Behavior: An Introduction to Community-Based Social Marketing* (Gabriola Island, British Columbia: 2011), 95.

experiential processing systems and analytical processing systems. The use of narrative or imagery targets our emotions via the experiential processing systems, which is often a better motivator for action.[45] A ski resort could easily appeal to the analytical side by talking about its emissions reductions in relation to a personally relevant figure, such as the number of gallons of gas saved or the carbon captured by a certain number of trees.

Issue framing is another important consideration. According to the Center for Research on Environmental Decisions (hereafter CRED), "Framing is the setting of an issue within an appropriate context to achieve a desired interpretation or perspective."[46] Although this might seem like an attempt at manipulation, the true intent of framing is to make complex issues more accessible to the general public. By placing climate change at the personally relatable level of a ski resort, we have already given the issue a local frame. CRED also mentions that "people have a natural tendency to avoid losses rather than seek gains. . . . For example, people may be more likely to adopt environmentally responsible behavior and support costly emissions reduction efforts if they believe their way of life is threatened and that inaction will result in even greater losses."[47] Thus, frankly acknowledging potential losses in snowpack and decreased availability of water for snowmaking and drinking could be a powerful wake-up call to motivate people to climate action. However, the time period in which this is framed is also very important. People place priority on threats that are perceived as more imminent.[48] Although high emissions scenarios virtually predict the end of skiing as we know it by 2100, inspiring people to take action to prevent something from happening eighty-seven years from now could be difficult. It

[45] Center for Research on Environmental Decisions, *The Psychology of Climate Change Communication: A Guide for Scientists, Journalists, Educators, Political Aides, and the Interested Public* (New York: Columbia University, 2009), 16 – 17, accessed August 6, 2013. http://guide.cred.columbia.edu/pdfs/CREDguide_full-res.pdf.
[46] Ibid., 6.
[47] Ibid., 11.
[48] Ibid., 10.

could be more effective to model the impacts at a closer date. While losses in snowpack might not be as dramatic in, say, 2050, the year will still be within many people's lifetimes (or their grandchildren's lifetimes), and consequently the issue becomes more pressing.

One of the major barriers to climate action that I have already mentioned is the perception that one's actions have no import. A ski resort can easily challenge that assumption by discussing its own sustainability initiatives and why they are important, as well as inviting visitors to engage in the same activities. There are two benefits to this: one, the resort gets to publicize its own good deeds; and two, visitors are given suggestions for action, which empowers them to take ownership over the issue. On its corporate website, Powdr Corp. (owner of nine ski areas across the United States) lists ten activities people can take to personally address climate change. From changing thermostat settings to turning off electronic devices when not in use, switching to green power, recycling, and shopping at farmers' markets, these are all ways individuals can curb their own greenhouse gas emissions. Importantly, any suggestions for action should be presented as a collection of actions to take wherever and whenever feasible, not simply a pick-and-choose scenario. Once again referencing Orams, climate communication programs should also give visitors the opportunity to act on the spot. At a ski resort this could include signing a pledge of commitment to adopt certain behaviors or participate in programs or purchasing eco-swag.

Place-based climate engagement is a burgeoning concept, and many of these strategies have theoretical grounding but lack empirical testing. Nevertheless, by focusing on impacts relevant to a specific place, incorporating a variety of communication techniques, presenting effective actions for mitigation, and inviting on-the-spot action, this framework outlines a helpful starting point for resorts willing to meaningfully engage their visitors on climate change.

Coming from a well-known ski resort this messaging might be even more important, as studies have shown that, rather than placing their trust in government, people tend to "rely on their trust in institutions when making decisions regarding scientific issues about which they do not have considerable knowledge."[49]

Let's Get Political

Before moving on, I would like to address one more possibility for action: political action. I know that I said ski resorts could address climate change without politicizing it, and – perhaps naively – I still think this is possible. In fact, I think they have the ability to transcend the politics while still advocating for a political response. The activities that resorts take and those suggested by Powdr Corp. are all necessary if our society is to move toward greater cultural sustainability. Alone, however, they are not enough to dramatically curb emissions to the extent that is necessary to avoid catastrophic global change. Besides, right now these measures are all voluntary. Nothing will happen if someone does not recycle an aluminum can, aside from the potential onset of crippling, yet temporary, eco-guilt.

In his book about bringing the sustainability revolution to the slopes of Aspen, Auden Schendler writes,

> Meaningful action recognizes the scale of the climate problem and responds at scale. We're simply not going to solve climate change by asking *motivated* individuals to drive Priuses, install solar panels, or replace their old refrigerators. There aren't enough of these good people, and the actions they're capable of are ultimately insignificant, even if every single one maxes out their opportunities. Which is not to say we shouldn't take these actions. They are important. It's just that we can't stop there. Unless personal action happens everywhere through policy mandates on a global scale, we're rescuing one teaspoon from the *Titanic*. What matters less is what you

[49] Thomas Dietz, Amy Dan, and Rachel Shwom, "Support for Climate Change Policy: Social Psychological and Social Structural Influences," *Rural Sociology* 72, no. 2 (2007): 207 – 208.

> personally do to cut emissions; what matters more is ensuring that *everyone on the planet is also doing what you do*.[50]

He is right, of course. The global community desperately needs to come to agreement on binding climate measures. As the second largest emitter of greenhouse gases on Earth, our country owes it to the rest of the world to aggressively cut carbon emissions.[51] But we need to be careful about the way we frame the issue of personal engagement with climate change, because it, too, has policy implications. Scannell and Gifford relate that "individual engagement with climate change issues can motivate some of these necessary behavior changes as well as foster the acceptance and longevity of climate-friendly policies."[52] Furthermore, Brownlee, Powell, and Hallo caution that being overly focused on mitigation via changes in national and international policy may lead individuals to "perceive their actions as ineffective."[53] And when they feel ineffective, they tend to take zero action, and might even lapse into apathy or denial, which is not at all helpful for policy. Therefore, especially when endeavoring to engage civil society with climate change, it remains important to communicate the opportunity for individual action. This should include the call to take political action.

Skiing has no political party and neither does climate change; it affects all of us. In the context of ski resort climate advocacy, encouraging political action does not imply telling people to vote for specific candidates or to join specific parties. Rather, if ski resorts are able to effectively communicate the importance of action on climate change, for those who internalize the message, climate change will cease to be a political issue. When that happens, there is a

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[50] Auden Schendler, *Getting Green Done: Hard Truths from the Front Lines of the Sustainability Revolution* (New York: Public Affairs, 2009), 35. Emphasis in original. Later in the book he does address the importance of individuals driving policy change.
[51] "Each Country's Share of CO2 Emissions," Union of Concerned Scientists, accessed August 7, 2013, http://www.ucsusa.org/global_warming/science_and_impacts/science/each-countrys-share-of-co2.html.
[52] Scannell and Gifford, "Personally Relevant," 61.
[53] Brownlee, Powell, and Hallo, "A Review," 5.

personal motivation to advocate for climate change; fear of breaking with traditional party lines becomes moot. Among other suggestions for individual action, visitors should be (politely) encouraged to call, write, or visit their representatives of all parties and urge them to support climate policy.

Some researchers have "argued that the US public's ambivalence toward action on climate change has also contributed to non-action, and that policymaking institutions are simply reacting to, or taking advantage of public opinion."[54] Herein lays the importance of creating a constituency of climate-concerned skiers. Social movements are an important element in bringing about environmental change in the United States. Indeed, Connelly et al. report that, "in the last decade or two there clearly has been increased participation and activity as the potential of . . . community-based organizations to respond to environmental issues has been recognized. Inaction on the part of government and industry has led to community action filling the vacuum."[55] Following Bosso's population ecology model of environmental group analysis, grassroots initiatives are the new niche fillers; their members make up Hawken's "blessed unrest"; and their existence is imperative for amassing a base of supporters for emerging environmental policy.[56] Politicians might be swayed by money, but ultimately, their tenure in Congress depends upon the will of their constituents. As we have seen with other social movements, most recently the efforts to legalize gay marriage, cultural change will influence political change. Obviously not all skiers and riders will be moved to political action or even want climate policy enacted. But for the 65 percent of skiers who believe that climate change is a

[54] Dietz, Dan, and Shwom, "Support for Climate Change Policy," 186.
[55] James Connelly et al., *Politics and the Environment: From Theory to Practice* (New York: Routledge, 2012), 124.
[56] Christopher J. Bosso, *Environment Inc.: From Grassroots to Beltway* (Lawrence: University Press of Kansas, 2005); Paul Hawken, *Blessed Unrest: How the Largest Social Movement in History is Restoring Grace, Justice, and Beauty to the World* (New York: Penguin Books, 2007).

pressing concern and the 76 percent who are worried about its impacts on the ski industry, it is important that they feel empowered and motivated to act.

Communications for Climate Advocacy

It is unlikely that all of the skiers and riders at a resort will participate in interpretive activities, but that does not mean they cannot be reached. Communications campaigns are another method that can be used to more fully engage visitors with climate messaging. Done creatively, a communications campaign could both create awareness for the climate change problem and encourage greater involvement with a ski area's brand. Futerra, a sustainability communications firm based in the UK, asserts, "Climate action is no longer a scientist's job; it's now a salesman's job."[57] Its guide on climate communications tells the story of Elmer Wheeler, a noted US salesman back in the 1940s. Wheeler is famed for his advertising strategy: "Don't sell the sausage – sell the sizzle!" We all know what a sausage is, but imagining the sounds and smells of a cooking sausage – the sizzle – is what entices people to want to buy it. The same is true for climate change. "For years we've tried to 'sell' climate change," the guide reads, "but a lot of people aren't buying. . . . For all of us desperately promoting action, finding ingenious ways to communicate climate change or just banging our heads against the hard brick wall of climate denial – we need to find the sizzle."[58] Indeed, in an online interview, Protect Our Winters' Executive Director Chris Steinkamp was asked how to engage audiences at ski resorts with climate change. With over a decade of marketing experience, his advice was not to dwell on the gloom and doom, but to create campaigns that people want to participate in. "We need to

[57] Futerra Sustainability Communications, *Sizzle: The New Climate Message*, 6, accessed August 8, 2013, http://www.futerra.co.uk/downloads/Sellthesizzle.pdf.
[58] Ibid., 2.

engage the consumers in what the resort is doing and activate them to become fans or part of the overall effort," he said.[59] Ski resorts need to find the sizzle.

According to a guide published by the international Climate Change Communication Advisory Group, "One way of bridging the gap between private-sphere behaviour changes and collective action is the promotion of pro-environmental social norms."[60] Indeed, in his book *Fostering Sustainable Behavior*, Doug McKenzie-Mohr relates that "too little attention has been given to the significant impact that norms can have on the adoption of sustainable behavior. If we are to make the transition to a sustainable future, it is critical that we are able to develop a set of societal social norms that support sustainability."[61] Social norms theory indicates that people will adopt behaviors perceived as popular if they believe that enacting the behavior will lead to benefits, if they have a strong affinity to a group enacting the behavior, or if the behavior is considered central to their identity.[62] Here, it is the second factor that is of interest to us.

Aggarwal suggests that people can "form relationships with brands in much the same way . . . they form relationships with each other in a social context."[63] A brand, or in this case, a ski resort, can become part of an individual's social network. Given the proliferation of corporate social media outreach, companies have evidently tapped into this idea. Ski resorts like Breckenridge have Facebook pages, Instagram accounts, Twitter accounts, and blogs, all designed to connect people with the brand. In the context of social networks, researchers

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[59] Chris Steinkamp, interview by Gregg Blanchard, "Climate Change and Resort Marketing: POW's Chris Steinkamp Interview," SlopeFillers (blog), April 29, 2013, accessed August 8, 2013, http://www.slopefillers.com/chris-steinkamp-interview/.
[60] Climate Change Communication Advisory Group, Communicating Climate Change to Mass Public Audiences (Cardiff, Wales: Climate Change Communication Advisory Group, 2010), 8, accessed August 8, 2013, http://pirc.info/downloads/communicating_climate_mass_audiences.pdf.
[61] McKenzie-Mohr, *Fostering Sustainable Behavior*, 62 – 63.
[62] Maria K. Lapinski and Rajiv N. Rimal, "An Explication of Social Norms," Communication Theory 15, no. 2 (2005): 134.
[63] Pankaj Aggarwal, "The Effects of Brand Relationship Norms on Consumer Attitudes and Behavior," *Journal of Consumer Research* 31 (2004): 87.

Lapinski and Rimal explain that "when individuals perceive that the prevalence of a behavior among their reference group is widespread and their identification with the group is strong, then they are more likely to engage in the behavior themselves."[64] The Climate Change Communication Advisory Group reinforces this notion, adding, "Networks are instrumental not just in terms of providing social support, but also by creating specific content of social identity – defining what it means to be "us." If environmental norms are incorporated at this level (become defining for the group) they can result in significant behavioural change (also reinforced through peer pressure)."[65]

Obviously there is a business advantage to enticing consumers to identify with your brand. For a ski resort, brand identity is a component of place identity and attachment: I don't just ski in Colorado, I ski at Breckenridge Ski Resort. If a skier identifies with the brand and the place, she is likely to ski there more often and care about the future of the area. Resorts have a clear economic incentive to build a social network around their brand. Thus, it is quite possible that by advertising its pro-environmental activities and climate change mitigation efforts, a ski resort could establish social norms that skiers will want to identify with.

How could a ski resort create social norms? First, it should advertise its own environmental efforts. There is undoubtedly room for improvement here, given that 39 percent of my survey participants were unsure if Breckenridge had environmental programs, and 32 percent did not know if the resort recycled or not. On resort property (and beyond the confines of a nature center) signs could be a widespread method of communication. Posted around a resort's recycling containers, light fixtures, water fountains, faucets, gondolas, lift towers – wherever! –

[64] Lapinski and Rimal, "An Explication," 135.
[65] Climate Change Communication Advisory Group, *Communicating Climate Change*, 8.

signs could explain the purpose of a particular activity and its net local effect. This is important: McKenzie-Mohr cautions that "to be fully effective, information about the impact of the newly adopted activities needs to be presented as well." Lastly, invoking Orams again, signs should invite people to participate in the activity. Increased signage alone, however, will not be effective. Some people will read them, some people will not. Therefore, resorts could also use social media to engage their visitors in environmental behavior. Posting photos on social media sites to advertise a resort's environmental projects could be an effective way to engage the public and encourage them to participate in similar activities. Moreover, resorts could invite people to submit their own photos. The incentive of seeing one's picture displayed on a resort's social media website could be a great way to inspire people to incorporate pro-environmental behaviors into their lives. This has the potential of creating a whole new social network – the relationship is no longer between a resort and an individual, but rather between the resort and all of the individuals banding together to act on climate. As the Climate Change Communication Advisory Group contends, "Through the enhanced awareness of what other people are doing, a strong sense of collective purpose can be engendered." Ski resorts have very clever people on their social media and marketing staff. If a company like Vail Resorts can devise successful engagement strategies like Epic Mix, surely it can figure out a way to make climate action sizzle.

Save Snow, Save the World

The importance of engaging people in climate issues reaches beyond individual patterns of behavior. In fact, McKenzie-Mohr asserts that "when people engage in actions that reduce CO_2 emissions, . . . they are likely to come to see themselves as the type of person who cares about climate change based upon their engagement in the behavior. These changes in how they

view themselves can significantly affect their support for policy changes."[66] Thus, by creating and fostering new sets of social norms, ski resorts can subtly encourage policy change.

It will not, of course, be easy. Besides underlying attitudes and values, there are a number of situational inconveniences that also contribute to noncompliance with sustainable behaviors. Indeed, McKenzie-Mohr reports that "the failure of mass media campaigns to foster sustainable behavior is due in part to the poor design of the messages, but more importantly to an underestimation of the difficulty of changing behavior."[67] This is discouraging, yes, but not an excuse to throw in the towel. Past failures can give climate change communicators an indication of what went wrong. In fact, these failures have inspired the creation of the strategies presented here: making complex concepts personally relevant, employing a variety of communication techniques, ensuring that messages are interesting, vivid, and concrete, and striving to create new social norms.

Not everyone has their heads in the snow. NSAA recently adopted a climate change policy, expressing the following: "Through this policy, we aim to raise awareness of the potential impacts of climate change on our weather-dependent business and the winter recreation experience; reduce our own greenhouse gas emissions; and encourage others to take action as well."[68] Sha Miklas, the environmental coordinator at Arapahoe Basin remarked, "For us, we think it's happening. Look at the swings in winter. We're not scientists. We're not climatologists. But we believe in it, and everything we're doing is trying to slow the process down."[69] A-Basin, as the ski area is commonly known, was one of the first resorts to participate in NSAA's Climate

[66] McKenzie-Mohr, *Fostering Sustainable Behavior*, 2.
[67] Ibid., 7.
[68] "Climate Change," National Ski Areas Association, accessed August 1, 2013, http://www.nsaa.org/environment/climate-change/. Unfortunately the plan does not mandate action.
[69] Sha Miklas, interview by author, Arapahoe Basin, March 13, 2013.

Challenge. In addition to suggesting avenues for personal action, Powdr Corp. also publishes its carbon footprint and advertises its current initiatives. Commendably, the resort commissioned two scientific studies to examine the effects that global warming has had on Park City Mountain Resort in Utah and in the community of Park City itself. These papers are both available on Powdr Corp.'s website. The city of Aspen started the Canary Institute, which studies local climate impacts, works for city-wide emissions reductions, and engages in public outreach. And, of course, Aspen Skiing Company has a climate change champion in Auden Schendler.

Shelly Grail told me that before Weller took over as Breck's environmental manager, there was a lot of discussion about climate change. Now, she said, "there's not as much anymore." This is a shame, because resorts can play a pivotal role in recruiting members to a larger climate advocacy body in America. Vail Mountain and Breckenridge Ski Resort are among the most visited ski resorts in North America. Imagine the beneficial influence the company could have on other resorts as well as the millions of individuals who ski and ride its slopes each year, if only it would adopt a climate outreach strategy.

Yes, climate change engagement might be scary for ski resorts; they risk greater scrutiny of their programs and/or being labeled hypocrites, they might alienate some customers, and there is no guaranteed return on investment. But fear of challenging the status quo is not what will usher in a low-carbon future. Because they themselves are vulnerable to climate change, ski resorts are in a unique position to communicate the issue to people who might otherwise be oblivious to its effects or feel disempowered to act. For America's ski resorts, climate advocacy is not only the right thing to do for the long-term sustainability of their businesses, but it is the ethical way forward for the future of our planet. Will the ski industry save the world? No, of

course not. It can, however, be a part of the solution. The ideas presented here can be used as the first steps in this process.

Limitations

My study presents an interesting and initial overview of the environmental opinions held by skiers and riders at Breckenridge Ski Resort. However, some limitations do exist. Initially, I wanted to conduct the survey on resort property, but I was denied permission to do so. Limited to approaching individuals in public places, it was difficult to comply with a preselected sampling plan. Thus, my sample population is not representative of US skiers and riders. Furthermore, I intended to survey only tourists (including day-visitors), but had to allow locals to take the survey, too, in order to obtain a reasonable sample size. It seems that standing around in freezing temperatures to take a survey is not an activity in which many folks are inclined to participate. And finally, I was just delving into this research at the time of my field-work in Breckenridge. Now that several months have passed and my knowledge of these subjects has deepened, I would redesign the survey and interview questions to increase the focus on climate change. Hindsight is, as they say, twenty-twenty – *and* inspiration for further research.

Chapter Seven

Conclusion:
Is it Ski Season Yet?

> Whatever degree of skill a skier may possess, he should never forget that his skis are after all only an instrument, a means through which he can enjoy the winter in all its glory and ruggedness, can breathe clean fresh air, can meet human beings in their true character, and can forget all the petty troubles which beset our so-called civilization. These are a few of the reasons why skiing is not merely a sport – it is a way of life.
>
> – Otto Schniebs, 1936[1]

From wooden planks, long slogs uphill, and *Idraet* to today's reverse camber, high-speed lifts, and thousand-acre resorts, the sport of skiing has come a long way in the past two hundred years. Indeed, if one thing stands out as we follow the sport's past and present, it is the ski industry's ability to innovate. The rise of the environmental movement forced the industry to conform to new regulations, and as a pro-Earth ethos has swept across America, resorts have been under more and more pressure to lessen their impacts on the environment, whether whole-heartedly or not.

Now, it is climate change that will usher in a new era of innovation, as long as ski companies are willing to take on the challenge. As I have shown here, the research on sense of place and ecotourism provides an encouraging basis from which to start. Environmental interpretation and communications campaigns would be a laudable means through which the ski industry could reach skiers and riders about the importance of environmental stewardship and climate action. Furthermore, each of these outreach techniques will be made more effective by

[1] Otto Schniebs, *Skiing for All* (New York: Leisure League of America, 1936), 12, quoted in Clifford, *Downhill Slide*, 10.

fostering visitors' place attachment to a resort. Of course, environmental outreach will not be quick and easy to implement; the success of these programs will depend on truly understanding the audience, tailoring programs accordingly, and being willing to adjust them if necessary. Nevertheless, US ski areas need to become both environmental educators and climate activists, not just for the skiers, but for the several hundred thousand industry employees, for the local and state economies, for the local ecosystems and wildlife, and for all of those affected, both regionally and globally.

For many skiers and riders, Otto Schniebs' words still ring true – nothing is quite as thrilling as gulping a deep breath of cold, pine-scented mountain air before plunging into the powdery depths of a fresh snowfall. Already I find myself looking forward to winter, although I am content to wait for Mother Nature to determine just when that winter should start. I realize, however, that there is life after skiing. But that is not the point. The continued sustainability of the ski industry stands as a measure of our global and national success in limiting greenhouse gas emissions. If history repeats itself and Colorado's High Rockies are once again dotted with ghost towns, the artifacts of colder winters gone by, then we'll really be in trouble. The ski industry has an imperative to spur a movement on climate action. Otherwise, it can watch its white gold melt away.

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