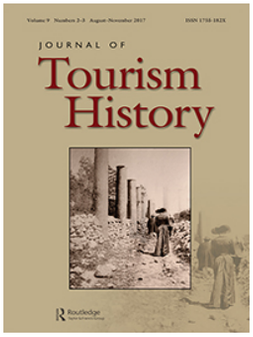

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Postwar play and petroleum: tourism and energy abundance in Rocky Mountain National Park

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ABSTRACT

Few historians have focused on the centrality of petroleum to tourism in the post-Second World War United States. We argue that oil, as a source of motive power that facilitated a certain style of travel and consumption, has been central to the cultural and physical construction of tourist spaces, especially national parks. We use Rocky Mountain National Park (RMNP) as our case study, analysing automobile tourism, urbanisation, and globalised mass consumerism, highlighted by its former ski resort and the array of petroleum byproducts consumed there. We examine the ways in which petro-fuelled cultures have been inscribed upon the park's landscape, becoming central to its history as a tourist destination. We suggest that rethinking tourism and protected areas within a world of fossil fuel-induced climate change necessitates an intimate understanding of how places like RMNP were made through oil abundance.

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Pick up any 'Touraide' roadmap from the Continental Oil Company (Conoco) from the 1940s through 1970s and you'll find triangular markers peppered across the foldout. The symbols do not indicate nearby fishing accesses, campground spots, or national parks, nor do they represent ski slopes, recreational areas, or public restrooms, though all the amenities listed above are included. The markers do not even denote 'points of interest' despite the fact that they, too, are charted. But they *do* pinpoint locations within the United States where postwar tourists would have found something essential to their journeys.[1]

These inverted triangles designated sites where travellers were able to purchase Conoco gasoline, motor oil, or other petroleum byproducts. The 1957 foldout of the state of Colorado showed 22 such Conoco 'service stations' alongside US Highway 34, a road which stretched some 620 miles from the Nebraska state line through Rocky Mountain National Park (RMNP). Conoco patrons probably used the 1963 roadmap of Yellowstone to a similar effect. They could have located six places to fill their automobile tanks with fossil fuels, including two situated a quarter mile from another geologic wonder, the

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[1]Continental Oil Company, *Travel Colorado with Conoco* (Chicago: H.M. Gousha, 1957), in possession of authors; Continental Oil Company, *Touraide Map of Yellowstone* (Chicago: H.M. Gousha, 1963), Special Collections & Archives, Renne Library, Montana State University-Bozeman (hereafter MSU); *Touraide Road Map of Colorado* (San Jose, CA: H.M. Gousha, 1973), in possession of authors; Continental Oil Company, *Touraide Map of Yellowstone National Park* (San Jose, CA: H.M. Gousha, 1973), MSU; James R. Akerman, 'American Promotional Road Mapping in the Twentieth Century', *Cartography and Geographic Information Science* 29 (2002): 175–92.

Old Faithful Geyser, and another four spots just outside park boundaries. The 1973 Conoco Touraide editions, however ironic due to 'oil shock' that year, united energy abundance and postwar tourism with a fleeting American maxim reproduced atop each roadmap: 'A country that runs on oil can't afford to run short'.[2]

For vacationers and recreationists, running short on oil would have been a difficult feat. These roadmaps made exceedingly obvious the physical presence of petroleum across the tourist landscape. Travelling westbound on US Highway 34 to RMNP, sightseers cruised by one Conoco pit stop, on average, for every 28 miles of road; and gas-station density only increased as they approached their destination. Once inside the park, tourists not only entered a landscape engineered for auto tourism and other hydrocarbon-dependent forms of leisure, but its wildlife were also intimately shaped by roadways and closely managed through the use of gasoline-guzzling vehicles. Less obvious, though, is why primary accounts and secondary interpretations have paid scant attention to the linkages between fossil-fuel wealth and leisure activities. At the same time tourists were re-connecting to 'nature' in national parks, many visitors may have become mentally disconnected from the material environments that allowed them to enjoy these nature preserves in the first place.[3]

While early historical works largely reinforced a dematerialised past, tourism scholarship is gradually moving towards a deeper material analysis that allows us to recover the inescapable relationships among petroleum energy, consumptive practices, and recreational ideas.[4] Historian David Louter has revealed how roads reconfigured sightseeing experiences in national parks, and historian Paul Sutter has demonstrated how the political struggles against them launched modern wilderness advocacy.[5] Scholars have cemented highways and automobiles as key components for tourism within the twentieth-century United States.[6] Petroleum, however, was partly responsible for energising greater park engagement, drilling into Americans what literary critic Stephanie LeMenager has called an 'ultradeep' attachment to oil.[7] And though more recent environmental histories of tourism do include material contexts, they have been more attuned to analysing how tourism altered the environment or constituted environmentalism, not how the

[2]Ibid.

[3]For the erasure of labour from tourist landscapes, see Thomas G. Andrews, '"Made by Toile"? Tourism, Labor, and the Construction of the Colorado Landscape, 1858-1917', *Journal of American History* (December 2005): 837–63. For Marx's classic philosophical definition of 'alienation' from nature that we seek to modify with our conception of 'dematerialization', see Karl Marx, *Selected Writings*, ed. Lawrence H. Simon (Indianapolis: Hackett Publishing, 1994), 63.

[4]For historiography, see Earl Pomeroy, *In Search of the Golden West: The Tourist in Western America* (Lincoln: University of Nebraska Press, 1957); John A. Jakle, *The Tourist: Travel in Twentieth-Century North America* (Lincoln: University of Nebraska Press, 1985); *Anne Farrar Hyde, An American Vision: Far Western Landscape and National Culture, 1820-1920* (New York: New York University Press, 1990); Hal K. Rothman, *Devil's Bargains: Tourism in the Twentieth-Century West* (Lawrence: University Press of Kansas, 1998); Cindy S. Aron, *Working at Play: A History of Vacations in the United States* (New York: Oxford University Press, 1999); David M. Wrobel and Patrick T. Long, eds., *Seeing and Being Seen: Tourism in the American West* (Lawrence: University Press of Kansas, 2001); Marguerite S. Shaffer, *See America First: Tourism and National Identity, 1880-1940* (Washington, DC: Smithsonian Institution Press, 2001); Lizabeth Cohen, *A Consumers' Republic: The Politics of Mass Consumption in Postwar America* (New York: Alfred A. Knopf, 2003); Susan Sessions Rugh, *Are We There Yet?: The Golden Age of American Family Vacations* (Lawrence: University Press of Kansas, 2008).

[5]David Louter, *Windshield Wilderness: Cars, Roads, and Nature in Washington's National Parks* (Seattle: University of Washington Press, 2006); Paul Sutter, *Driven Wild: How the Fight against Automobiles Launched the Modern Wilderness Movement* (Seattle: University of Washington Press, 2002).

[6]Tom McCarthy, *Auto Mania: Cars, Consumers, and the Environment* (New Haven, CT: Yale University Press, 2007); Christopher W. Wells, *Car Country: An Environmental History* (Seattle: University of Washington Press, 2012); Char Miller, ed., *Cities and Nature in the American West* (Reno: University of Nevada Press, 2010).

[7]Stephanie LeMenager, *Living Oil: Petroleum Culture in the American Century* (New York: Oxford University Press, 2014), 3–4.

environment itself made certain forms of tourism possible.[8] To fill this scholarly void as one would fill a gasoline tank, we argue that hydrocarbon abundance inundated postwar vacationing experiences. Fossil fuels, in other words, reshaped environmental conditions in and around national parks from which tourist cultures emerged.[9]

The place-based stories that follow illuminate how a new regime of energy carried tourists to and through RMNP, transformed natural ecologies to suit wildlife enthusiasts, and facilitated the emergence of mass-consumer skiing. We begin the journey with a trip on US 34. For the paved road that extended well over 1000 miles eastward from the park site, petroleum impacted how travel took form upon the expressway from its construction to maintenance to accelerated usage. As more vehicles entered RMNP along highway corridors from Front Range cities, urban-industrial centres became intimately tied to wilderness areas. Once inside park borders, we slow down our cars to examine park fauna – particularly the elk, one of the site's most popular animals – while, behind the scenes, National Park Service (NPS) officials harnessed new technologies such as jeeps to manage these 'wild' ecosystems. For our last stop, we discuss the only ski resort in the park's history: the Hidden Valley Ski Area. Carving down the mountainside entailed greater reliance on oil over the years as the Second World War military technologies adapted to a postwar leisure economy, offering Army-surplus trucks that powered rope-tows and synthetic materials that lined skis, boots, and jackets. In all these instances, park tourism developed in lockstep with petroleum.

Getting to the park

In 1960, local communities near RMNP's eastern entrance – Estes Park, Loveland, Greeley – established the Colorado US 34 Association in order to pursue two goals for the expressway after which the group was named. Louis Pettyjohn, president of the newly-formed coalition and a full-time resident of Estes Park, outlined their aims. First and foremost, members desired 'to increase the amount of traffic on the highway', mostly because of the economic benefits that came with more travellers. And secondly, in relation to the first purpose, affiliates eventually wanted to fashion a 'national association' out of the local organisation by rallying political and financial support from 'cities and towns along US 34 all the way east to Chicago, where the highway originates'.[10]

In less than a decade, the two objectives were realised. The organisation dropped its Colorado label in 1962 and redefined itself as the National US 34 Association, which brought together neighbouring eastern states in promoting auto tourism. The organisation worked with various entities in Nebraska, Iowa, and Illinois to rename motorway segments along the route so that all these states featured the 'US 34' designation on signage and roadmaps.[11] While the absolute distance of the highway remained the same

[8]Jerry J. Frank, *Making Rocky Mountain National Park: The Environmental History of an American Treasure* (Lawrence: University Press of Kansas, 2013); William Philpott, *Vacationland: Tourism and Environment in Colorado's High Country* (Seattle: University of Washington Press, 2013); Michael W. Childers, *Colorado Powder Keg: Ski Resorts and the Environmental Movement* (Lawrence: University Press of Kansas, 2012).

[9]Phillipe Descola, *Beyond Nature and Culture*, trans. Janet Lloyd (Chicago: University of Chicago Press, 2013), 3–31.

[10]Frank Colohan, 'Colo. 34 Assn. Is Formed Here', *Greeley Daily Tribune*, May 21, 1960; R.C. Haraden, Letter to RMNP Superintendent, October 2, 1961, Folder: A22 Chamber of Commerce, 1956-1962, Box 23: 079-71-A0111, Record Group 79: National Park Service, National Archives and Records Administration, Broomfield, CO (hereafter RG79-NARA).

[11]R.C. Haraden, Letter to RMNP Superintendent, December 10, 1962, Folder: A22 Chamber of Commerce, 1956-1962, Box 23: 079-71-A0111, RG79-NARA.

length, the thoroughfare shrunk in the minds of potential tourists as a single road traversed the entire way to RMNP.[12] Transportation flows increased along US Highway 34. Within 10 years of the association's founding, automobile traffic had quadrupled in the Big Thompson Canyon between Loveland and Estes Park, and annual visitation to the RMNP had doubled.[13]

And yet the US 34 Association was not totally responsible for its own success. Each time more travellers jumped into their vehicles for trips to RMNP, they contributed to what historian Bob Johnson has called a 'carbon nation', which took its fullest shape in the early postwar years.[14] During this period, oil production from domestic and foreign wells soared: American fields had generated some two billion barrels of crude petroleum in 1948, expanding to over 3.4 billion barrels by 1972.[15] Much of this extracted oil found its way into refineries and then into automobile tanks: postwar American suburbanites, on average, bought between 10 and 20 gallons of fuel a week.[16] Oil wealth meant faster speeds: on many highways, states raised the speed limits from 35 or 45 miles per hour (mph) in the mid-1940s to upwards of 70 mph by the early 1970s.[17] As greater numbers of vehicles – devouring gasoline and discharging carbon dioxide (CO_2) – propelled more sightseers to their destinations, energy abundance and postwar tourism co-developed. They formed the multifaceted ways in which these vacationers understood the roads, automobiles, and filling stations that served national parks.

Speedy travel to national parks required modern highways. Completed in the 1930s, two road projects made RMNP more reachable to visitors. Construction labourers used shovellers, bulldozers, and dump trucks to carve Trail Ridge Road (added to US 34) across the Continental Divide of the Rockies, breaking ground in 1926 and finishing work in 1932. The thoroughfare joined Going-to-the-Sun Road in Glacier, Skyline Drive in Shenandoah, and other high-mountain highways to open up access to far-flung sections of wildlife preserves.[18] These roads also framed park scenery as landscape architects made conscious efforts to produce what NPS historian David Louter has labelled 'windshield wilderness' for sightseers.[19] From 1932 to 1938, the Colorado State Highway Department spent $1.3 million to construct the final 25-mile segment of US 34 in the Big Thompson Canyon. Road-building crews excavated at least 372,000 cubic yards of rock, gravel, and dirt – enough material to fill 115 Olympic-sized swimming pools – to shore

[12]For the distinction between absolute and relational space, see Henri Lefebvre, *The Production of Space*, trans. by Donald Nicholson-Smith (1974; Oxford, UK: Basil Blackwell, 1991), 1–67. Trans-Mountain Road Association, *Your U.S. 34 Highway now closed 8 months in Rocky Mountain National Park can be the MOST SCENIC ALL WEATHER CROSS COUNTRY ROUTE!*, 1961, Folder: A22 Chamber of Commerce, 1956-1962, Box 23: 079-71-A0111, RG79-NARA.

[13]'Big Thompson/North Fork Canyons Recreation Acquisition Project', Folder 16, Box 1, Records of Wright Water Engineers, Inc., Water Resources Archive, Colorado State University, Fort Collins, CO (hereafter WWE); 'Annual Park Visitation (1904 – last calendar year)', Rocky Mountain National Park Reports, https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20%281904%20-%20Last%20Calendar%20Year%29?Park=ROMO (accessed April 8, 2015); McComb, *Big Thompson*, 9.

[14]Bob Johnson, *Carbon Nation: Fossil Fuels in the Making of American Culture* (Lawrence: University Press of Kansas, 2014), 150–62.

[15]U.S. Energy Information Administration, 'U.S. Field Production of Crude Oil', https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MCRFPUS1&f=A (accessed July 18, 2016).

[16]Donald Worster, *Shrinking the Earth: The Rise and Fall of American Abundance* (New York: Oxford University Press, 2016), 142–3.

[17]U.S. National Research Council, *Managing Speed: Review of Current Practice of Setting and Enforcing Speed Limits*, Special Report 254 (Washington, DC: National Academy Press, 1998), 81–5, http://onlinepubs.trb.org/onlinepubs/sr/sr254.pdf (accessed July 18, 2016).

[18]Sutter, *Driven Wild*, 136–9.

[19]Louter, *Windshield Wilderness*, 3–10, 59–67.

up RMNP's eastern portal. Petroleum, figuratively and literally, paved the way for these pieces of highway: oil powered earthmoving equipment to erect both thoroughfares, as well as covering the roads in the form of asphalt to facilitate smooth, dust-free rides.[20] Networks of 'oiled' blacktop only expanded across the United States from 1956 onwards with twin arrival of the Interstate Highway and Mission 66 programs (Figure 1).

As the US 34 Association worked to boost transportation volume, tourist entities sang the praises of auto tourism, and cheap oil flowed, motorist travel to RMNP steadily increased. The number of automobiles driving through the Big Thompson Canyon offers a case in point. During the busy summer season in the early 1930s, it was likely that a few hundred vehicles travelled along the route per day. Once the modern highway was built, this daily number quickly escalated into a few thousand cars following the Second World War. By the early 1970s, an estimated 8326 automobiles, on average, cruised up and down this stretch of US 34 each day during the peak months of June through September. These swelling figures paralleled the annual rise in total number of visitors to RMNP, many of whom used the canyon highway as their chief access point. Park attendance, with nearly all individuals entering by car, grew from 255,874 people in 1930, to 1,275,160 in 1950, and up to 2,357,900 by 1970.[21]

US 34 funnelled a varied sort of people into the park from places near and far. A 1956 study about Colorado tourism, conducted by a business professor at the University of Colorado-Boulder, has shed some light on this vacationing population. One finding was that most people who visited Colorado came from middle- to upper-class backgrounds. In 1953, for instance, the median household income in the United States stood at $3516. However, the average wages for American families who vacationed that same year totalled $4135, while the annual median earnings for those who did not amounted to $2880. With gasoline at about thirty cents a gallon, wealthier households, if they so desired, could afford to buy over 4000 more gallons of fuel than poorer ones. Another discovery was that most persons who travelled to Estes Park and RMNP, besides those who already lived along the eastern foothills of northern Colorado, hailed from Midwestern and Great Plains states. Tourists primarily followed the travel corridor that had been established by US 34. The largest proportions of out-of-state visitors hailed from Illinois, Texas, Kansas, Iowa, and Nebraska. From farmers to factory workers to financiers, park sightseers engaged in diverse occupations but shared one thing in common: over 90% of the people who had visited Colorado in 1955 journeyed by car, and each average trip distance equated to more than 2500 miles.[22]

Travel narratives frequently obfuscated the importance of energy abundance to US 34. In fact, just as American consumption of petroleum skyrocketed from 1945 to 1973, the

[20]For a more detailed version, see Will Wright, 'Accelerating Waters: An Anthropocene History of Colorado's 1976 Big Thompson Flood' (Master's thesis, Colorado State University, 2016), 63–94.

[21]'Big Thompson/North Fork Canyons Recreation Acquisition Project', Folder 16, Box 1, WWE Records; 'Annual Park Visitation (1904 – last calendar year)', Rocky Mountain National Park Reports, https://irma.nps.gov/ Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20%281904%20-%20Last%20Calendar%20Year%29?Park=ROMO (accessed April 8, 2015); David McComb, *Big Thompson: Profile of a Natural Disaster* (Boulder, CO: Pruett, 1980), 9.

[22]L.J. Crampon, *The Tourist and Colorado* (Boulder: University of Colorado, Bureau of Business Research, 1956), 3, 6–9, 14, 27, 30–4, Box 14: Geographic Files, 978.8 Colorado, 1930-1940-1951-1956, Stephen H. Hart Research Library, Colorado Historical Society (hereafter CHS); Office of Energy Efficiency and Renewable Energy, 'Average Historical Annual Gasoline Pump Price, 1929-2015', http://energy.gov/eere/vehicles/fact-915-march-7-2016-average-historical-annual-gasoline-pump-price-1929-2015 (accessed July 26, 2016).

Figure 1. An automobile climbs Trail Ridge Road (US 34) in RMNP, circa 1960. Courtesy of Nathan Finck Collection, Rocky Mountain National Park Archives.

volume of US-based book references to 'oil' and 'gasoline' plummeted.[23] In *Estes Park: Resort in the Rockies* (1949), for example, geographers Edwin Foscue and Louis Quam discussed at-length the impact of transportation infrastructure on tourism development around RMNP. Despite examining roads and highways on almost one-third its pages, their work omitted any mention of gas or oil.[24] Writers Marion Talmadge and Iris Gilmore followed a similar trajectory in *Colorado Hi-Ways and By-Ways* (1967). They spent more ink discussing how modern cars and highways had reduced the travel time between urban settings and scenic hinterlands than acknowledging the role that fossil fuels had played in collapsing that distance. 'In one day', the two remarked, 'an ardent motorist can make a circle trip through … ROCKY MOUNTAIN NATIONAL PARK, one of the few remaining unspoiled beauty spots in America, … from DENVER, BOULDER, LONGMONT, LOVELAND, and other eastern slope towns'.[25] Like the materials above, many tourist accounts disregarded energy sources during a time when petroleum was ubiquitous.

In other cases, the connections between oil and tourism were only dimly visible. During the late 1960s, regional newspapers across the United States ran half-page advertisements

[23]'Oil' Google Books Ngram Viewer, https://books.google.com/ngrams/graph?content=oil&year_start=1940&year_end=2000&corpus=17&smoothing=0&share=&direct_url=t1%3B%2Coil%3B%2Cc0 (accessed August 4, 2016); 'Gasoline', Google Books Ngram Viewer, https://books.google.com/ngrams/graph?content=gasoline&year_start=1940&year_end=2000&corpus=17&smoothing=0&share=&direct_url=t1%3B%2Cgasoline%3B%2Cc0 (accessed August 4, 2016).

[24]Edwin J. Foscue and Louis O. Quam, *Estes Park: Resort in the Rockies*, American Resort Series No. 3 (Dallas: University Press in Dallas, 1949), Colorado State University Libraries.

[25]Marion Talmadge and Iris Gilmore, *Colorado Hi-Ways and By-Ways: A Comprehensive Guide to Picturesque Trails and Tours*, Vol. 4 (Denver: Heather Enterprises, Inc., 1967), 8, Folder: 978.8 Colorado 1967, Box 17: 978.8 Colorado Geographic Files, 1965-1969, CHS.

with the large, bolded headline: 'Break the old routine with a close-to-home auto trip'.[26] Each write-up featured two circular sightseeing routes of no more than 300 miles round-trip from a major metropolitan area. In 1967, and again in later years, Colorado Springs's *Gazette Telegraph* featured one such display. On a 216-mile loop from Denver through RMNP, the ad boasts, 'your family has traveled to the rooftop of the Rockies, across the Continental Divide and back, a one-day or weekend vacation-in-miniature'. Tucked away on the page's bottom-right corner, small print reveals the promotion's true culprit: 'This series of tour suggestions is published on behalf of your local service station dealer by the AMERICAN PETROLEUM INSTITUTE'.[27] API, a powerful lobbying organisation for oil corporations, subtly urged Americans to fulfil their economic duty by travelling to RMNP and by consuming more gasoline.

While API urged potential tourists to take to the highways, it simultaneously instructed service station owners on growing their small businesses through the promotion of tourism and recreation. 'Stimulating travel – whether it be long vacations, weekend trips or evening drives', the API wrote to gas station owners in 1965, 'offers intriguing possibilities for increasing the sale of petroleum products'. Implying the existence of a veritable postwar utopia, API argued that 'the continued growth of the travel and recreation business is assured for the following reasons: the continued population growth, the trend to larger disposable incomes, better roads and transportation, tax cuts, more leisure time and longer paid vacations, better education'. API suggested that service stations seek out local and regional tourist locales, including national parks, and offer to advertise those attractions in their gas stations. Gas station owners were tasked with becoming tourism evangelists, with the API suggesting how to persuade customers to take specific trips and how to solicit businessmen to help diversify promotional efforts. Standing at the centre of these guidelines was the desire for both API and individual gas station owners to promote a broad vision of continuous economic growth through the consumption of petroleum products. Spectacular vacation destinations such as RMNP offered avenues towards the realisation of that goal.[28] By 1970, API's promotional spread in local newspapers added to the trip endorsement that 'oil is basic to a better life for the American family'.[29]

Gas stations masked the centrality of petroleum by playing off gendered notions of the family. Before the Second World War, American society had mostly defined the manly provider by his ability to work on behalf of his wife and children. During the postwar years, however, oil wealth invigorated commercial production so that the successful male breadwinner was determined by his ability *not* to work. In 1940, for instance, the average work week totalled 44 hours. By 1960, it had fallen to only 37.5 hours.[30] With union membership assuring paid time off, middle-class men could now take their

[26]For some examples of the American Petroleum Insitute's advertising reach, see *Deseret News*, May 2, 1967; *Spokane Daily Chronicle*, October 8, 1968; *Toledo Blade*, 16 July 1968; *[Nashua] Telegraph*, May 14, 1968; *St. Petersburg Times*, October 11, 1967; *Pittsburgh Press*, April 22, 1968.

[27]American Petroleum Institute, 'Break the old routine with a close-to-home auto trip', *[Colorado Springs] Gazette Telegraph*, October 10, 1967; American Petroleum Institute, 'Break the old routine with a close-to-home auto trip', *[Colorado Springs] Gazette Telegraph*, June 11, 1968.

[28]'How the Local Oil Marketer can Sell More Gasoline', American Petroleum Institute, 1965, in Fred R. Harris Collection, Series 1, Box 16, Folder 17A, Carl Albert Center, University of Oklahoma, Norman, OK.

[29]American Petroleum Institute, 'This weekend do more than just end the week', *[Colorado Springs] Gazette Telegraph*, July 14, 1970.

[30]Jakle, *The Tourist*, 185–6.

household on vacation. Masculine figures were still available to serve families at filling stations as they travelled along US 34. Sporting blue suits, peaked caps, and bow ties, Standard Oil attendants diverted attention from the main task of filling up the gasoline tank by washing windshields, checking tire pressures, and giving directions.[31] Texaco attendants, wearing similar green outfits, tried to live up to their company's advertising jingle: 'More and more people trust their car to the *man* who wears the Texaco star'.[32]

Automobile usage continued to soar with the coming of the Mission 66 programme. Funded by Congress in 1956, Mission 66 further developed infrastructure in preparation for the 50th anniversary of the National Park Service 10 years later. Administrators gave priority to intensive 'day use' visitation over prolonged stays or ecological considerations as evidenced by the completion of three new visitor centres along Trail Ridge Road in RMNP: in 1965, Alpine near the Continental Divide of the Rockies; in 1967, Beaver Meadows on the east side near Estes Park; and in 1968, Kawuneeche on the west side near Grand Lake. The NPS Master Plan for implementing Mission 66 openly admitted, 'While desirable, it is not essential for the visitor to leave the road to experience the inspiration of these surroundings'.[33] After RMNP built cutoffs, turnouts, overlooks, and parking lots to augment nearby highways – namely, US 34 at Loveland, US 36 at Lyons, and US 40 at Granby – the inflow and outflow of cars only expanded.[34]

One such Mission 66 development was at Bear Lake Road, improving road conditions with easier grades and adding an asphalt-paved nature trail. By the mid-1970s, NPS officials calculated that about 4200 vehicles drove upon that road per day during the high vacation season.[35] These automotive tendencies, however negligible, represented more significant environmental changes that have been altering atmospheric conditions and threatening natural resources. Scientific understandings support a causal relationship between auto emissions and changing climate. The typical car, according to recent studies, produces approximately one pound of CO_2 for each mile driven. As vehicular travel increased within RMNP – emitting CO_2 as engines churned – so, too, did the general rise in global atmospheric CO_2 that had produced a warming atmosphere. Each summer during the 1970s, plumes of CO_2 over the popular Bear Lake section of RMNP totalled at least 12 million pounds. Every year during the same decade, the tailpipes of transportation vehicles around the world, particularly concentrated in the global North, released around 880 billion pounds of CO_2.[36]

[31]Standard Oil Company of Indiana, *Colorado* (Chicago: Rand McNally, 1958), in possession of authors; Standard Oil Company of Indiana, *Colorado* (Chicago: Rand McNally, 1960), in possession of authors.

[32]For quote, see Texaco Oil and Gas Company, *Colorado* (San Jose, CA: H.M. Gousha, 1974), emphasis added by authors; and for alternative wording, see 'Texaco Sky Chief Gasoline Commercial (1960s)', YouTube, https://www.youtube.com/watch?v=RPk-lRVpDq4 (accessed July 27, 2017).

[33]U.S. Department of the Interior, National Park Service, 'Master Plan Narrative – Mission 66 for Rocky Mountain National Park, Volumes 1&3' (Washington, DC: National Park Service, 1961), 5 as quoted in Maren Thompson Bzdek and Janet Ore, 'The Mission 66 Program at Rocky Mountain National Park: 1947-1973', Public Lands History Center Report, 2010.

[34]For an historical overview of Mission 66, see Ethan Carr, *Mission 66: Modernism and the National Park Dilemma* (Amherst: University of Massachusetts Press, 2007). For a more detailed look at RMNP, see Bzdek and Ore, 'The Mission 66 Program at Rocky Mountain National Park: 1947-1973'. For a narrative on construction of the Beaver Meadows Visitor Center, see Chapter 5 of Sarah Allaback, *Mission 66 Visitor Centers: The History of a Building Type* (Washington, DC: Department of the Interior, 2000), https://www.nps.gov/parkhistory/online_books/allaback/ (accessed July 14, 2017).

[35]Frank, *Making Rocky Mountain National Park*, 53.

[36]For the approximate amount of carbon emitted by automobiles on Bear Lake Road, we multiplied forty-two hundred vehicles, by 30 days, by four months, by 25 miles. Environmental Protection Agency, Office of Mobile Sources, 'Automobile Emissions: An Overview', 1992; Environmental Protection Agency, Office of Transportation and Air Quality, 'Questions and Answers: Greenhouse Gas Emissions from a Typical Passenger Vehicle', May 2014; Tom McCarthy, *Auto Mania*,

Auto tourism and energy abundance acted like a two-way street, mutually reinforcing one another. In one direction, cheap and plentiful oil enabled more park visitors. In the other direction, rising visitation demanded more petroleum. Just as recreational ideas and a consumer economy fostered networks of highways, parking lots, and gas stations in and around RMNP, petroleum energy shaped how these tourist experiences took form. The environmental historian Christopher Wells observed that analysing 'the landscape's physical arrangement is crucial to understanding why Americans drive so much'.[37] Applying this insight to national parks, Americans drove so much because the tourist landscape practically demanded it. Problems would eventually arise at the nexus of petroleum and park tourism. Today, RMNP managers strive to negotiate those elements of the past that have generated record visitation with the same historical forces that have produced overcrowding, habitat fragmentation, and climate change.[38]

Wildlife tourism

The auto-centric landscape that emerged in RMNP during its early years deeply shaped its ecosystems. Not only did roads bring growing numbers of people and automobiles into contact with wildlife, but they also limited elk migrations out of the park, which precipitated overgrazing. At the same time, new carbon-dependent technologies such as Army-surplus jeeps facilitated the more vigorous forms of management that booming elk populations required. Around mid-century, roads and motor vehicles of various types became central players in an emergent infrastructure that placed unprecedented pressures on elk in and around the park. Tourists and park managers unwittingly produced ecological conditions that could not sustain large elk herds. This wildlife problem and its various solutions were tied up in new cultural ideas about environmentalism that tourists increasingly adopted, and which were linked to increased tourism and the material abundance of oil.

For many Americans living in the first decades of the twentieth century, booming populations of iconic wildlife species indicated healthy parks. For RMNP and other sites in the American West, that species was elk. As late as the 1930s, park managers and NPS officials considered tourist-luring animals such as elk 'more useful' than predators such as bears, wolves, coyotes, and mountain lions.[39] Elk, deer, Bighorn sheep, and other large herbivores offered tourists a spectacular but non-threatening form of wild nature that parks could easily market and sell. As a result, park managers and private citizens, hoping to engineer ecosystems ideal for tourists, eradicated predators in areas surrounding parks, removing those species that regulated elk herds and creating the conditions for population explosions.[40] Such conditions prevailed in and around

236; Scripps Institution of Oceanography, 'The Keeling Curve: A Daily Record of Atmospheric Carbon Dioxide', https://scripps.ucsd.edu/programs/keelingcurve/ (accessed August 24, 2015); Joshua P. Howe, *Behind the Curve: Science and the Politics of Global Warming* (Seattle: University of Washington Press, 2014); EPI Data Center, 'Miles Traveled by Cars, Trucks, and Motorcycles in the United States, 1960-2012', Earth Policy Institute, http://www.earth-policy.org/data_center/C23 (accessed August 24, 2015); Arnulf Grübler, *Technology and Global Change* (Cambridge, UK: Cambridge University Press, 1998), 329.

[37]Wells, *Car Country*, xxvi.

[38]William B. Monahan and Nicholas A. Fisichelli, 'Climate Exposure of US National Parks in a New Era of Change', *PLoS One* 9 (July 2014): 1–13.

[39]Richard West Sellars, *Preserving Nature in the National Parks: A History* (New Haven, CT: Yale University Press, 2009), 119.

[40]Frank, *Making Rocky Mountain National Park*, 115, 121–3.

RMNP during the interwar years. By the end of the Second World War, park biologists increasingly discovered valley floors and creek beds stripped of grasses and willows, the consequence of oversized elk herds.[41] In response, the park initiated a lethal in-park culling programme, as well as accompanying efforts to tag and track animals.

Culling was, from its inception in the mid-1940s, a controversial process. One problem was that visitors and people living around the park had been conditioned to consider overgrazed lands and inflated elk populations as their normal baseline, and highways like US 34 helped produce this perspective. Neal G. Guse, Jr, RMNP's first permanent wildlife biologist, noted in 1962 that 'much of the local opposition to "management" comes from those who remember the early 1940s when it was not uncommon to observe deer and elk herds numbering in the hundreds along the roads at any time of the day or night'.[42] People naturalised the presence of booming elk herds, especially auto-tourists who celebrated the large herds that gathered along roadsides and offered visitors striking views from the safety of their cars. Before the 1970s, most Americans desired to experience nature from the comfort of their own vehicles, a form of wildlife viewing that gradually transformed elk behaviour. RMNP's elk, and mammals in other parks in the American West, often behaved as if they were immune to the noises and crowds that roads funnelled into the park. In the early twentieth century, NPS personnel celebrated herds of elk that appeared conditioned to the gasoline-powered machines. Roger Toll, who headed RMNP in the 1920s, celebrated the 'tame' elk that, to the delight of visitors, gathered along roadsides *en masse*.[43] Yellowstone's staff were fond of its own elk herds, which in the early-twentieth century were closely handled by park staff and fully conditioned to the presence of automobiles.[44]

As the tourist industry around RMNP grew and the demand for roads expanded, subsequent engineering projects created a landscape that constrained elk movement and set the stage for overgrazing. Throughout the latter decades of the twentieth century, park managers highlighted the fact that urbanisation adjacent to RMNP and along the Front Range increasingly cut off traditional elk migration routes. Summering in the high-altitude areas common within park borders, elk left the high country during the winter, seeking lower altitudes, warmer temperatures, and more abundant forage in Colorado's foothills and plains. But anthropogenic factors – notably the construction of roads and highways in the valleys that connected mountain and plain – limited elk movement into this eastern rangeland.

Park naturalists first identified the connection between urbanisation and the constraining of elk in 1943. Estes Park, which sits directly east of RMNP, has always been a relatively small town. But the middle decades of the twentieth century represented a time of accelerated growth in the city. Between 1930 and 1960, when elk overpopulation became a major issue within the park unit, Estes Park's population grew from just over 400 people to well over 1600 residents. The number of automobiles registered in Colorado grew dramatically during this period as well, from roughly 266,000 vehicles in 1935 to

[41]A deeper history of this issue is elucidated in Karl Hess, *Rocky Times in Rocky Mountain National Park: An Unnatural History* (Niwot: University Press of Colorado, 1993).

[42]'Long Range Management Plan for the Eastern Rocky Mountain Elk and Deer', Elk and Deer Records, Rocky Mountain National Park Museum Storage Facility, Estes Park, CO, folder 5, Box 1, Series 003.01 (hereafter Elk and Deer).

[43]Frank, *Making Rocky Mountain National Park*, 124.

[44]See Sellars, *Preserving Nature in the National Parks*; R. Gerlald Wright, *Wildlife Research and Management in the National Parks* (Urbana-Champaign: University of Illinois Press, 1992).

over a million in 1962. This increase in automobiles was accompanied by new roadways, including over 15,000 miles of additional roads built by the state of Colorado and a growing number of federally-funded highways such as US 34. Predictably, the influx of vehicles and roads prompted a precipitous increase in gasoline consumption. In 1935, Coloradoans burned just over 150 million gallons of fuel. By 1965, that number had more than quadrupled to 886 million gallons.[45]

Denver, Fort Collins, Longmont, Loveland, and other Front Range cities that funnelled tourists into RMNP experienced substantial growth over this period as well. Overall, the state population doubled between 1940 and 1970, growing from 1.1 million people to 2.2 million. Suburban developments on the margins of metropolitan areas converted former rangeland into what historian Lincoln Bramwell has dubbed 'wilderburbs' and prompted the construction of roads, homes, and businesses in narrow mountain valleys through which elk traditionally migrated. Colorado grew into a national centre of development that not only supported growth in urban areas, but also in the construction of mountain communities where ranchland and wild range was increasingly paved over with tourism infrastructure.[46] As more and more people desired to both visit and live in Colorado's high country, less space and fewer resources were reserved for RMNP's elk.

Park managers were tasked with managing strained ecosystems and keeping RMNP accessible and attractive to tourists. Fortunately for them, the technologies and infrastructure that flourished in this petro-fuelled world also offered solutions. Whenever possible, park managers culled elk from roadsides, often in early morning hours, when visitors were sparse. The first elk culling protocols, produced by park naturalist David Condon in 1943, stipulated that 'all animals should be killed as near to points accessible to motor transportation' and that 'the distribution of roads will make the major portion of the range areas accessible for reduction purposes'.[47] Elk conditioned to living near roads made culling much more efficient as rangers and their winch-equipped trucks could easily haul away carcasses. In important ways, the elk had been the very reason for the construction of the park's thoroughfares and, before culling began, the infrastructure that made the animals accessible to visitors had offered few threats to what was one of the park's biggest tourist attractions.[48] Now, those very same roads became conduits for more efficient culling.

More help came to resource managers following the Second World War, when jeeps migrated from the battlefields of Europe and Asia to national parks, making off-road culling and tracking far more feasible. The first mention of RMNP's jeeps appeared in 1956, in park reports during RMNP's 11th year of direct culling. 'The National Park Service Jeep pickup 4 × 4 with winch is a must for reduction work', the elk management report stated.[49] In subsequent years, park staff requested jeeps with stronger winches, presumably for hauling carcasses. Regardless of their pulling power, park staff – especially those responsible for culling elk – celebrated jeeps for their ability to drive off-road and

[45]*Highway Statistics: Summary to 1965* (Washington, DC: U.S. Department of Transportation, 1965), 6–8, 25, 128.
[46]Lincoln Bramwell, *Wilderburbs: Communities on Nature's Edge* (Seattle: University of Washington Press, 2014), 20–1.
[47]David D. Condon, Associate Park Naturalist, 'Recommendation and an Outline for the Management of the Elk and Deer Population in Rocky Mountain National Park', 1943, folder 1, Series 003.01, Box 1, Elk and Deer.
[48]See Frank, *Making Rocky Mountain National Park*; Hess, *Rocky Times in Rocky Mountain National Park*; *Elk and Vegetation Management Plan, Rocky Mountain National Park* (Washington, DC: Department of the Interior, 2007).
[49]'Reduction Program, 1955-56, R.M.N.P.', folder 6, Series 003.01, Box 1, Elk and Deer.

traverse terrain that normally required horses or hiking boots.[50] The success of the jeep even inspired park rangers to request an 'over the snow vehicle', or snowmobile, which could be employed during winter culls.[51] When jeeps were not readily available for elk reconnaissance trips, rangers were forced to take to their feet. The park's wildlife management reports noted 10-mile snowshoe hikes and long trips by horseback. Park staff utilised these time-consuming, inefficient ventures in attempts to track elk herds and view overgrazed woodland and grassland.[52] Ideally, these jobs were completed behind the wheel (Figure 2).

Jeeps provided an important source of accelerated, oil-fuelled labour at a moment when elk culling grew urgently necessary, yet increasingly controversial. Off-road vehicles offered park staff the opportunity to thin elk herds without upsetting the tourists who enjoyed the park. Heavy culling had been undertaken by the park between 1944 and 1950. Expansive culling operations fostered enmity from many tourists, who viewed the killing of elk as anathema to the National Park Service's mission as protector of wildlife. During a two-month period in 1944, NPS staff culled over 400 elk.[53] The park staff struggled to hide from visitors such pronounced efforts at lethal control, but jeeps enabled off-road culling efforts which were at least in part obscured from the vast majority of patrons. As hydrocarbon-powered machines expanded beyond roadways, they could be increasingly applied to new forms of resource stewardship in the attempt to maintain for park-goers a façade of unmanaged wild ecosystems.

Through a combination of off-road vehicles and highways, visitors' cars and commercial developments, RMNP's elk were increasingly implicated in a fossil fuel-rich culture of tourism and wildlife management. Beyond the park's boundaries, urban development along the Front Range corridor before and during the Second World War constrained elk movement. Projects such as the construction of Highway 34 – tied to a national programme of highway building – put serious strain on RMNP and its elk herds both by cutting off migration paths and by bringing more people into the park who threatened to break the mountain ecosystems' ability to sustain both wildlife and humans. For the thousands of elk killed during the park's mid-twentieth century culls, the end came because the animals no longer fit into habitats increasingly squeezed by people and their unprecedented levels of mobility. As more petroleum energy flowed into Colorado, Estes Park, and RMNP via this web of travel, more organic energy in the form of forage was subtracted from the park's elk habitat.

Skiing the slopes

When driving west along US Highway 34 and into RMNP – where the highway becomes Trail Ridge Road – one curves upward towards the tree line along the walls of

[50]'Wildlife Management, Rocky Mountain National Park, 1958-59', folder 6, Series 003.01, Box 1, Elk and Deer; 'Wildlife Management Report for 1960-1961', folder 6, Series 003.01, Box 1, Elk and Deer.
[51]'Wildlife Management Report for 1960-1961', folder 6, Series 003.01, Box 1, Elk and Deer.
[52]'Reduction Program, 1955-56, R.M.N.P.'; Horseback reconnaissance folder 2, Series 003.01, Box 1, Elk and Deer; Neal Guse, Jr, Park Biologist, 'Natural Sciences Research Plan, Rocky Mountain National Park, 1965', in Elk Research Plans 1965-1988, folder 20, Series 003.04, Box 2, Elk and Deer.
[53]A. Lynn Coffin and J. Barton Herschler, 'Elk-Deer Management in Rocky Mountain National Park', 1950, folder 2, Series 003.01, Box 1, Elk and Deer; Neal G. Guse, Jr, Biologist, RMNP, 'Effective Management Program Requirement for Eastern Rocky Mountain Deer and Elk Herds', folder 14, Series 003.01, Box 2, Elk and Deer.

Figure 2. Cow elk being released after banded and tagged by park officials during winter 1963. Note the Jeep pickup in the background. Courtesy of Rocky Mountain National Park Archives.

Hidden Valley. Covered in pine, spruce, and fir trees, today it looks much like the numerous subalpine regions that dot the park. That was not the case 60 years ago, when the Hidden Valley Ski Area dominated the landscape. Opened in 1955, RMNP's first and only ski resort was forged at the onset of modern recreational skiing, a venture that's lifeblood was crude oil.[54] Rope tows, wound through wheels turned by Army-surplus truck engines, pulled skiers up the slopes. Around the world, the same technologies began to haul skiers to the tops of snowy mountains where, not long before, one had to hike up in order to ski down. Eventually, skiers clad themselves in petroleum-based, water- and wind-proof synthetic materials such as nylon, and eventually Gore-Tex, and even the skis upon their feet were constructed from plastic and fibreglass materials.

Before the onset of this postwar, hydrocarbon-rich iteration of skiing, the activity was largely devoid of petrochemicals, required much more human muscle, and constantly placed skiers in precarious environments and uncomfortable situations. Skis moulded from ash timber were liable to break and could quickly become saturated and heavy with moisture. Leather boots constantly shrank and expanded, their fit thrown in flux by the extreme environmental conditions to which skiing exposed them. Skiers who wanted a respite from the cold often gathered in rudimentary wooden shacks filled with

[54]Matthew Huber uses the term 'lifeblood' to describe petroleum's role in Americans' postwar, pro-capitalist habits of mobility and privatisation. Family vacations to national parks fit this paradigm. Matthew T. Huber, *Lifeblood: Oil, Freedom, and the Forces of Capital* (Minneapolis: University of Minnesota Press, 2013).

smoke that rose from wood-burning stoves. In short, skiing's more organic characteristics often presented serious discomfort.[55]

But when Hidden Valley opened, petroleum byproducts were beginning to reshape both skiing and the national parks in momentous ways, moulding Colorado's mountains into places of sport and leisure for middle- and upper-class tourists.[56] New materials, infrastructures, and geographies of commodity exchange helped modernise skiing, transforming it from a mode of winter transportation and specialist recreation into a venture of mass consumption and mass tourism.

Hidden Valley's post-Second World War history was marked by both private and NPS efforts to transform what had been an informal, local ski run into an operational resort. Petroleum energised this transformation. The first motorised rope tows came to Hidden Valley in the late 1940s. First patented by a Swiss inventor in 1932, rope tows – including RMNP's early versions – were often powered by car and truck engines.[57] 'The new rope tow was a fearsome thing for inexperienced riders', recalled Estes Park resident and ski enthusiast James Glendenning. 'George [Hurt, the ski area's first director] had a V-8 engine turning a flywheel that whisked people about half way up the left side of the Big Drift in a few breathtaking seconds'.[58] A propane burner kept the Cadillac V8 engine warm overnight, so that it could function come the next day, thus maintaining Hidden Valley's newfound hydrocarbon dependence around the clock. Powerful rope tows and other lift technologies proved essential to transforming Hidden Valley from an informal ski area into a money-making venture. Rope tows provided perpetual movement across the valley, accelerating the cycle of skiers who were pulled up the mountain and who then carved down the slopes (Figure 3).

By the 1970s, 42,000 skiers per year enjoyed Hidden Valley, using transport and facilities infused with fossil fuels. Automobiles whisked families to the ski area while busses carried youth groups from Front Range cities. A ski lodge with concessions was built, providing warmth for mountain enthusiasts and those who watched them. Even in the early years, some park-goers decried the urban-style development that embedded a host of synthetic materials in one of the park's alpine valleys. 'Are the Park Service's objectives to preserve our natural features or to destroy them?' one man queried in a letter to RMNP. 'Again the huge asphalt parking lot, and large lodge, and tows have been made as conspicuous as possible and consequently completely destroy the scenic aspects of Hidden Valley.' Another patron of the park also denounced the asphalt parking lot, describing it as a 'scab' that had no place where nature was meant to be preserved.[59] While neither of them noted asphalt's status as a petroleum byproduct, both critics of Hidden Valley highlighted how certain material elements facilitated certain tourist experiences. Oil, embedded in various

[55] John Fry, *The Story of Modern Skiing* (Lebanon, NH: University Press of New England), 25.

[56] Historians and scientists alike have noted that the emergence of a globalised, mixed-carbon energy regime after the Second World War rendered the second half of the twentieth century 'unique in the entire history of human existence' in regards to the frequency and level of anthropogenic transformations of the planet's various natural systems. Will Steffen, et al., 'The Trajectory of the Anthropocene: The Great Acceleration', *The Anthropocene Review* 2 (April 2015): 1–3.

[57] Jean Vives and Morten Lund, 'The Way It Was: Getting Up', *SKI*, February 1979, 44.

[58] Barth and Leggett, *Finding Hidden Valley*, 44, 47.

[59] *Rocky Mountain National Park: Final Master Plan* (Washington, DC: U.S. Department of the Interior, 1976), https://www.nps.gov/romo/learn/management/upload/final_master_plan.pdf (accessed July 16, 2017); Les Viereck Letter to National Parks Magazine editor, October 31, 1957 and Chester McQueary letter to Director of the NPS, Conrad Wirth, July 28, 1958, both in Folder: A3615 Complaints, 1954-1960, Box 24, RG79-NARA.

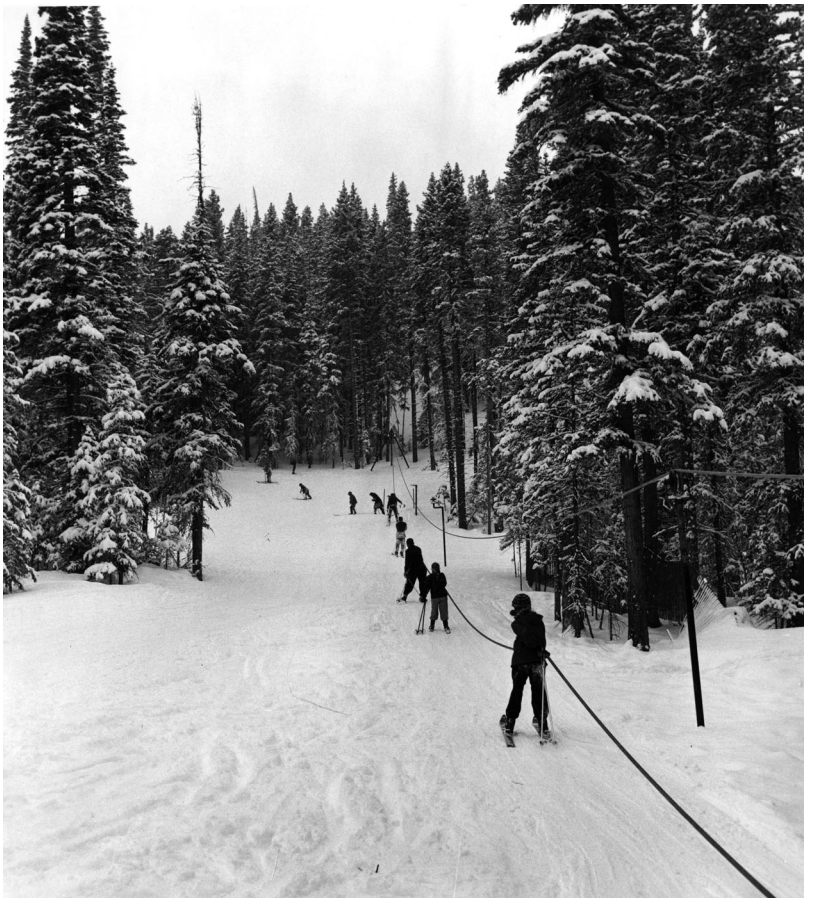

Figure 3. Tourists hold on to one of Hidden Valley's rope tows for beginning and novice skiers, circa 1960. Courtesy of Rocky Mountain National Park Archives.

forms within Hidden Valley, threatened those who wanted to experience 'natural' scenery while literally paving the way for a new type of ski-bound visitor.[60]

Petroleum byproducts also tied skiers, the valley, and RMNP to people and places tens of thousands of miles away. The park has preserved artifacts that illustrate the global changes tied to hydrocarbon abundance that undergirded the rise of modern skiing, artifacts that contrast with skiing's earlier, more informal era. Today, two sets of historical skis are stored in the park's museum storage facility. One set is entirely wooden, save for simple leather bindings that would have strapped an early-twentieth-century Coloradoan to the rudimentary planks. There are no markings that denote a place of production or sale. The wooden skis maintain an artisanal, pre-consumerism feel. Lying beside this early set of skis on the storage shelves is a pair of Kazama brand skis, likely from the 1970s or 1980s. Painted red, white, and blue, the Kazama skis bear the markings of the globalised, energy-intensive capitalist system from which they came. A fusion of plastic, wood, and

[60]For a model on how to historically analyse ski resorts, see Andrew Denning, *Skiing into Modernity: A Cultural and Environmental History* (Berkeley: University of California Press, 2014).

Figure 4. Wooden ski contrasted with modern composite ski, both found in RMNP. Photo by authors. Courtesy of Rocky Mountain National Park Archives.

fibreglass, these skis bear bar codes, evidence of the highly-rationalised consumer society that made them. The Kazama skis are also clearly marked as 'Made in Japan', indicating the skiing industry's postwar global reach (Figure 4).

Subsumed in the six-foot-long modern Kazama skis are connections that bind together Japan, the Middle East, the Pacific Northwest, and RMNP. These international ties illuminate how oil abundance reshaped the park's tourist landscapes. Likely constructed with a wooden core, the Kazama skis do retain some material resemblance to the amateur-made skis that preceded them. The similarities stop there, however. The older, antiquated pair of skis were probably constructed from trees harvested within or around RMNP's eventual boundaries where their owner presumably lived. Conversely, the wood that constituted the core of the Kazama skis likely crossed the Pacific not once, but twice, in its lifetime. Japan was a relatively heavily timbered country, but its postwar, American-led reconstruction forced excessive demands upon its domestic forests. As a result, Japan was importing more timber by 1970 than it produced, a trend that only increased throughout the decade. Ten years later, Japan imported over 48,000 cubic metres of lumber annually, primarily from the Pacific Northwest.[61] Japanese economic development threatened to exhaust the domestic wood supply, but it also facilitated strong trade ties with the United States and Canada, countries that acted as important sources of trees. These exchanges were rooted in petroleum and its ability to power the large transport container ships that carried timber and other goods across oceans.[62] The wooden cores of modern skis could continue to be manufactured, even if those cores originated in Oregon, Washington, or British Columbia. Producers could then sell those skis to retailers in the United States,

[61]Thomas R. Cox, 'The North American-Japan Timber Trade: The Roots of Canadian and U.S. Approaches', *Forest and Conservation History* 34 (July 1990): 113.
[62]Marc Levinson, *The Box: How a Shipping Container Made the World Smaller and the World Economy Bigger* (Princeton, NJ: Princeton University Press, 2008).

and Japan could utilise the windfall to continue funding its modern economy, perhaps through reinvestment into its flourishing auto or electronics industries.

Petroleum not only fuelled the machines that carried the Kazama skis and their component parts across oceans. Petroleum was literally embedded in the skis in the form of plastic and fibreglass. In its production, fossil-fuel powered furnaces heated glass to over 2500 degrees Fahrenheit before the molten material mixed with chains of hydrocarbons fractured from crude oil, creating a fibre-reinforced plastic that was at once lightweight and durable – ideal for skis.[63] Japan's access to the petroleum-based inputs that characterised this manufacturing process were always precarious. Even though Japan's timber production was being eclipsed by imports in the 1970s and 1980s, its forests were much more secure than the country's oil supply. An island nation bereft of local petroleum reserves, Japan imported 99% of its crude oil in the mid-1980s. Sixty-five per cent of that oil originated in the Middle East.[64] Indeed, since the beginning of its postwar modernisation, Japan has depended upon Arab countries for most of its petroleum supplies. Oil wrested from Persian Gulf states powered cars, ships, and even helped build skis, accoutrements that tourists could not go without when visiting Hidden Valley.

The economic relationships and energy regime that produced the Kazama skis were far removed from the forces that fashioned their ancestral counterparts. The earlier wooden skis were produced locally, and likely for practical purposes. Skis and snowshoes were often the easiest way to traverse Colorado's highlands during winter in the years before interstates and snowploughs. Enos Mills, a famous naturalist who championed RMNP's founding, used wooden skis to trek through the Front Range when he worked as a snow observer for the state of Colorado in the late nineteenth and early twentieth centuries.[65] Conversely, the Kazama skis were produced for sport and for fashionable consumers, as evidenced by their bright colour scheme. This was a different form of skiing, one that tapped into global commodity chains, creating a mass-consumer culture that inspired tourists to take to the slopes. Both pairs of skis were buried in the snow of Hidden Valley, but their material differences illuminate how RMNP and its visitors became integrated into a world increasingly made by petroleum.

Conclusion

Mass tourism to national parks has been the product of a brief moment in human socio-economic history that has largely been powered by fossil fuels. Indeed, park-going travel and hydrocarbon consumption goes beyond the automobile. Railroads – which burned precipitous amounts of coal – lobbied for the creation of protected lands years before the National Park Service's founding in 1916 and the concurrent surge in car drivers. Beginning in the late nineteenth century, the Northern Pacific advocated for the creation of Yellowstone, the Southern Pacific for Yosemite, and the Atchison, Topeka and Santa Fe Railroad for Grand Canyon. Stephen Mather, first director of the NPS, cultivated ties with

[63]Susan Freinkel, *Plastic: A Toxic Love Story* (New York: Houghton Mifflin Harcourt, 2011), 14–15, 252–3; Ginger Gardner, 'The Making of Glass Fibers', *Composites World Blog*, March 25, 2009, http://www.compositesworld.com/articles/the-making-of-glass-fiber (accessed July 16, 2017); *How Plastic Is Made*, http://www.plasticseurope.org/what-is-plastic/how-plastic-is-made.aspx (accessed July 16, 2017).
[64]Paul McDonald, 'Japan's Oil: Coping with Insecurity', *The World Today* 42 (August–September 1986), 147.
[65]Alexander Drummond, *Enos Mills: Citizen of Nature* (Niwot: University Press of Colorado, 1995), 151.

railroad executives, knowing that their companies desired protected wild lands to attract upper-class, train-riding tourists.[66] However, the automobile's growth in popularity after the First World War indicated a more inclusive tourism that grew more and more affordable and accessible to those less privileged than early park-goers.

RMNP, established in 1915, was born when oil's motive power emerged as a fuel source for a large swath of the American populace. Between the end of the Second World War and the 1970s, the limited but real democratisation of material wealth invigorated an expanding and vacationing middle class. Petroleum was perhaps the quintessential material that shaped this period, and national parks such as RMNP became a locus for the direct and indirect consumption of oil. In this sense, parks were not anomalous wilderness landscapes removed from urban-industrial society.[67] Rather, parks acted as important centres of recreation within an economy and culture that increasingly commodified leisure and capitalised on a new class of tourists. In recent decades, scientists, environmentalists, and NPS personnel have increasingly called attention to the burdens that this history of petroleum-fuelled tourism has placed, and continues to place, on park ecosystems. RMNP has grown vulnerable to both overcrowding and the stresses of human-induced climate change, challenges that warrant people to understand the history of travel to and through the park and the possible future consequences that lie ahead for this popular tourist destination.

Automobiles have always been integral to RMNP. When Congress drafted a bill to create the park, lawmakers produced a barebones legal document that outlined the park's boundaries, but contained few other specifics. One guarantee that legislators put forth, however, was a promise of 'provisions for the use of automobiles therein'.[68] The park's ties to a hydrocarbon-fuelled economy were thus embedded in its founding legislation, and eventually in its landscape in the form of roads, parking lots, and scenic pull-offs. While this connection to highways and abundant petroleum resources helped democratise park visitation, the effects of oil consumption upon the park's nonhuman resources increasingly threaten its mission to preserve nature for future enjoyment. In 2015, over four million people visited the park. That number set a new record and was over a million more visitors than the park handled just five years earlier in 2010.[69] As of April 2017, visitation to the park was up 21% from the previous year's record high.[70] Often parking lots, situated at various trailheads, are full by 10:00 am. As a result, visitors usually park their vehicles illegally along roadsides, harming vegetation and bringing people and their machines into close proximity to wildlife. Furthermore, increases in noise attributed to more and more automobiles threatens the preservation of a soundscape

[66]Alfred Runte, *Trains of Discovery: Western Railroads and the National Parks* (Niwot, CO: Rinehart, 1990), 16–19, 31–3, 39–41. See also, Runte, *National Parks: The American Experience*, 2nd ed. (Lincoln: University of Nebraska Press, 1987), 44–7, 61, 66, 94, 113, 166.

[67]See William Cronon, 'The Trouble with Wilderness: Or, Getting back to the Wrong Nature', in *Uncommon Ground: Rethinking the Human Place in Nature*, ed. William Cronon (New York: W.W. Norton, 1995), 65–90.

[68]U.S. Congress, *An Act to Establish the Rocky Mountain National Park in the State of Colorado, and other Purposes*, January 26, 1915, 63rd Cong., 3rd sess., 798–800.

[69]National Park Service Visitor Use Statistics, Rocky Mountain NP, Annual Park Recreation Visitation, https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20(1904%20-%20Last%20Calendar%20Year)?Park=ROMO (accessed July 22, 2016).

[70]Ann Marie Ward, 'Another Traffic Jam in the Great Outdoors', *Colorado Public Radio*, July 10, 2017, https://www.cpr.org/news/story/another-traffic-jam-in-the-great-outdoors-garden-of-the-gods-to-study-overcrowding (accessed July 16, 2017).

Figure 5. RMNP's 'gas station', where National Park Service vehicles fuel up every day. Longs Peak, the park's tallest mountain, looms in the background. Photo by authors.

within the park that was once relatively free of mechanical cacophony.[71] Much like it did in the years immediately following the Second World War, RMNP again faces a critical mass of motor vehicles and visitors, one that threatens both visitors' experience of wildness and the very organisms that give the park its wilderness characteristics (Figure 5).

The petro-fuelled culture that produced RMNP has also helped produce anthropogenic climate change, perhaps the most serious threat to the park's ecosystems. Scientists have shown that past instances of rising temperatures and drying climates brought on by abrupt climatic changes have led to significant increases in wildfire in the Rocky Mountain region of North America.[72] The prospect of catastrophic fire in the park has only been heightened in recent years with the onset of pine beetle infestations, which have killed millions of trees in the park and will likely thrive in warmer conditions free from prolonged, insect-killing cold spells.[73] Furthermore, nitrogen emitted into the atmosphere as a byproduct of fossil fuel consumption acidifies soil and threatens the continuation of diverse and resilient plant life.[74] Scientists have dated dramatic upticks in nitrogen deposition in the park to 1950, a date that coincided with explosive growth in the number of hydrocarbon-fuelled machines located along Colorado's Front Range.[75] The consumption of petroleum both within and beyond the park alters its ecosystems, and the probability of dramatic

[71]Scientists have recently begun measuring automobile noise in RMNP and its effect on hikers. Researchers found that hikers would have to walk over a half-mile past all trailheads adjacent to Bear Lake Road in order to experience 'natural quiet', defined as less than 25 decibels. Logan Park et al., 'Modeling and Mapping Hikers' Exposure to Transportation Noise in Rocky Mountain National Park', *Park Science* 26 (Winter 2009-10): 59–63.

[72]J.R. Marlon et al., 'Wildfire Responses to Abrupt Climate Change in North America', *Proceedings of the National Academy of Sciences of the United States of America* 106 (February 2009): 2522.

[73]Matthew Diskin et al., 'Forest Developmental Trajectories in Mountain Pine Beetle Disturbed forests of Rocky Mountain National Park, Colorado', *Canadian Journal of Forest Research* 41 (2011): 783; Barbara J. Bentz et al., 'Climate Change and Bark Beetles of the Western United States and Canada: Direct and Indirect Effects', *BioScience* 60 (2010): 604–5, 609.

[74]T.C. McDonnell et al., 'Modeled Subalpine Plant Community Response to Climate Change and Nitrogen Deposition in Rocky Mountain National Park', *Environmental Pollution* 187 (April 2014): 59.

[75]Alexander P. Wolfe, Jill S. Baron, and R. Jack Cornett, 'Anthropogenic Nitrogen Deposition Induces Rapid Ecological Changes in Alpine Lakes of the Colorado Front Range (USA)', *Journal of Paleolimnology* 25 (January 2001): 2–5.

physical changes to its landscapes will only increase as temperatures continue to warm and western North America's climate grows more volatile.

Building sustainable eco-tourism in parks and other protected areas will require an understanding of how the petro-fuelled history deeply shaped sites such as RMNP in their present form and generated the problems outlined above. Answers could come in several forms, each posing their own practical and philosophical challenges. A limited number of shuttles currently whisk visitors from RMNP's visitor centres to numerous drop-off points. A mass transition to shuttle transportation as a means of replacing automobile travel in the park would solve the problem of overcrowding and also greatly reduce the per-visitor consumption of petroleum. Programs of this type require funding, something the National Park Service is woefully short of, to implement new shuttles and drivers as well as new administrative protocols. Perhaps more importantly, park visitors, especially those middle- and upper-class sightseers who constitute the majority of RMNP's postwar tourist cohort, might object to this form of mobility. Vacationing in postwar America has often been a family affair. Automobiles render the nuclear family mobile while preserving the family unit's insularity and intimacy. In this sense, a shuttle-based system of travelling through the park threatens the social dynamics that enliven an auto-dependent tourist culture.

But embedded in an economy dependent upon fossil fuels, where petroleum producers wield political power and operate through generous subsidies and tax cuts, consumers have no choice but to visit RMNP in their cars. Cheap oil – a product of politics as much as consumer demand – has helped incentivise the influx of more and more vehicles and has thus facilitated a certain tourist economy. That economy is not designed to respond to the slow but momentous environmental changes that auto-tourism has wrought in RMNP. A worthy response to the threats posed by overcrowding and even climate change will have to be collective in nature, and would require a rethinking of how people move through and experience the park. Seriously evaluating the magnitude of petroleum consumption that occurs in the park in the form of tourist automobiles might inspire a move towards new, less impactful ways of traversing RMNP, but only as part of a larger realisation that oil remains entrenched in our twenty-first-century political economy and that individual consumer choices alone will not change that. The material world within which tourist cultures emerge increasingly demand such self-reflection and the place of the park system within a broader petroleum-fuelled society must be reckoned with if the value of RMNP and parks like it is to be freed from oil.

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