Dear MHS Environmental History Seminar participants,

It is a pleasure to be able to present you a draft of the first chapter of my dissertation entitled “Forests and Power in the United States Empire, 1891-1914”. It outlines the seeds for why forestry came to be adopted as a tool for U.S. statecraft in 1891 and why forest policy has since principally targeted what contemporaries called the “Intermountain region”. For context, my dissertation is composed of six chapters outlining the following: the politics behind developing a central bureaucracy for forest administration; the U.S. Forest Service research agenda; forest administration as a tool to govern Intermountain waters; forestry as a means to police Intermountain grazing; and timber management as a mechanism to incorporate Intermountain environments into the broader U.S. political-economy. I argue that all of these demonstrate a shift in U.S. statecraft from the 1890s onwards and suggest that federal forestry facilitated the surveillance of the inhabitants of the Intermountain region in ways that challenge historians to consider the region as a part of the U.S. empire at the turn of the twentieth century.

I am very much looking forward to your comments, suggestions and criticisms, especially regarding the coherence of the argument presented below. Thank you again for this opportunity and I hope you enjoy the paper.

Evan Bonney
Doctoral Candidate
Sciences Po Paris
I - Chapter I – The Intermountain West by 1891

January 6, 1888 was a critical day for Bernhard Fernow (1851-1923). Appointed in 1886 as Chief of the U.S. Department of Agriculture Division of Forestry, the Prussian-American had spent all of 1887 compiling a report on the forest resources of the Rocky Mountains. It was a test. As a naturalized citizen armed with eight years of experience in the militarized Prussian Forest Service, Fernow was charged at the special request of President Grover Cleveland (1885-1889), to provide the first systematic assessment of the forests of the Rockies.¹ But never before had such a study been undertaken by a government agent, let alone by someone who had never been educated in a U.S. university. Cleveland however, believed that Fernow had the repertoire. With his expertise in bureaucratically managing forest resources, only he could construct a report that provided “a basis in formulating needed forest legislation with reference to the timber lands of the region which are still held in the hands of the General Government.”² For Cleveland, doing so was imperative. Appealing fifteen years later to the readers of the genteel Century Illustrated Magazine he underlined that forest legislation was the check to a “careless wastefulness” whose “palpable manifestation is seen in the destruction of tree growth and the denudation of watersheds on our Western lands.”³

Fernow agreed. What Cleveland identified as “our Western lands” was in the midst of a major sociocultural transformation in 1888; one that required restraint. Opening his report, he stressed that “the pioneering days are rapidly disappearing before the energetic push and advancement of railroads and settlements, and with the changed conditions of life, in communities instead of in isolated log huts, a change in the manner of life and its adjustment to the demands of civilized existence is called for.”⁴ He was not exaggerating. As U.S. Census Superintendent Robert Porter (1889-1893) confirmed two years later, no other region in the United States had experienced a demographic boom comparable to that of the West where the

⁴ Fernow, 7.

population nearly doubled from 1.76 to 3.02 million between 1880 and 1890.\textsuperscript{5} But, as Fernow explained, ending what he called the “lavish liberality” of the “pioneer existence” was not needed in all of the West.\textsuperscript{6} Rather, it was only most critical in southern California, and the whole of the states and territories of Colorado, Idaho, Montana, Utah, New Mexico, and Arizona. It was here, in a portion of the West known to contemporaries as the “Intermountain Region”, where Fernow observed a “wholesale clearing [of trees]” that stripped its mountainsides bare and induced “the rains to run off as from a roof and permitting the snows to melt and their waters to pour down in torrents at a time…”. Consequently, as he noted, “agriculture in the valleys below is first endangered and then made impossible.”\textsuperscript{7} The message was clear. If the Intermountain portion of the fastest growing region of the United States was ever going to sustain settlement, then the habits of its inhabitants needed to be checked.

Fernow’s conclusion in 1888 presents a paradox in the history of the United States. If – as many have argued – the settling of the western U.S. during the late-nineteenth was due to the spread of railroads, the allure of precious metals, and a thirst for farm- and rangeland, then Fernow’s call to restrain the inhabitants of the Intermountain region reveals that the U.S. federal


\textsuperscript{6} Fernow, 7.

\textsuperscript{7} Fernow, 7, 12-13. \textit{The Daily Inter Mountain} was issued from Butte, Montana from 1881 to 1901, only superseded by \textit{The Butte Inter Mountain} from 1901 to 1912. Another contemporary newspaper containing the titled “intermountain” was \textit{The Intermountain Catholic} published from Salt Lake City, Utah from 1899 to 1920. See “U.S. Newspaper Directory, 1690-Present”, \textit{Chronicling America}, Library of Congress, <https://chroniclingamerica.loc.gov/search/titles/> (accessed Dec 6, 2023).
state facilitated settlement much more than historians have previously suggested. While this has perhaps been unintentional, historians continue to explain the settlement of the western U.S. through the analytical framework of settler colonialism which portrays settlers as germs whose insatiable appetite for land was most responsible for wrestling the environments between the Great Plains and the Pacific Ocean out of the indigenous that had long lived there. When the state is acknowledged, it is portrayed as a subordinate factor to the settler. Congress may have passed legislation to sell U.S. lands and fund U.S. Army campaigns to subdue Indian tribes on to reservations, but it was the settler – often white and of Euro-American origin – that transformed the western United States into a livable space for settlement. Fernow’s report however demonstrates that settler colonialism fails to explain the settlement of the Intermountain West. With a climate that was both “in many parts of the region, not favorable to tree growth”, and so arid that the “regularity of water-supplies is all-important,” settlement here hinged on ensuring that its natural resources were not exhausted. This, as Fernow underlined, required some form of police that settler colonialism overlooks.

There were however two problems facing Fernow in 1888. The first was that local and state forms of policing natural resources had already existed in the Intermountain West well before its demographic explosion of the 1880s. As Maurice Crandall and Eric Perramond demonstrate, several bands of Pueblo Indians along the Rio Grande, Salt, and Gila river valleys elected ditch captains to govern intricate systems of irrigation canals long before Hispanic colonists called them acequias and adopted the position as part of the local administration of Nuevo Mexico. When the United States incorporated Nuevo Mexico at the conclusion of its war with Mexico in 1848, Congress permitted the acequia system to remain an administrative feature in New Mexico Territory. Furthermore, when Congress approved Colorado territory for statehood in 1876, they admitted it as the first state in U.S. history whose constitution

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10 Fernow, 12-13

empowered a state government to police the waters, timber, and minerals within its borders.\textsuperscript{12}

Resources here were therefore far from ungoverned before 1888. While this further suggests the inaccuracy of settler colonialism to explain the settlement of the Intermountain region where resources had already long been administered, albeit locally. It also reveals that the second problem facing Fernow was how to propose a system of central administration that superseded these local forms of control. The solution lay in expanding the powers delegated to Congress and the Executive to now include the administration of forestland.

This was novel in U.S. statecraft, and the primary trouble was that the forests that Fernow now suggested to administer hardly resembled those familiar to Representatives, Senators, and administrators from east of the Great Plains. Indeed, as one of the contributors to Fernow’s report, Abbott Kinney (1850-1920), explained, “the term ‘forest’ as it is understood in the older States, is applicable in only a limited extent to the natural tree and brush growths of southern California.”\textsuperscript{13}

But what Kinney further highlighted to who he called “the Eastern man,” was that a forest in 1888 was no longer defined by its appearances. Rather, what mattered was its function. As chairman of the California Board of Forestry, Kinney explained that tangled brushwood – locally known as chaparral in southern California – composed a forest that:

\begin{quote}
acts as a reservoir, in allowing the rains of the wet season time to seep into the soil and rock veins, to appear again in the dry season as springs in the low country. This brush, together with the trees, also protects the country from the formation of destructive torrents and floods, and modifies the desert winds, which are already somewhat detrimental, at times, to vegetation.\textsuperscript{14}
\end{quote}

In other words, a forest was a technology that made environments inhabitable. Regardless of whether they were composed of trees or of underbrush, what mattered was that a forest be considered as a tool to store moisture and buffet the drying-effect of winds that so that it could “maintain the tax-paying power of the community, which can not exist here if the springs become dry.”\textsuperscript{15}

Future settlement in the Intermountain West therefore relied on redefining a forest according to its function rather than its appearance in 1888. Three years later on March

\textsuperscript{12} Articles XVI and XVIII , *The Constitution of the State of Colorado Adopted in Convention March 14, 1876; Also the Address of the Convention to the People of Colorado* (Denver: Tribune Book and Job Printing House, 1876). For a list of delegates to the Colorado Constitutional Convention of December 20, 1875 to March 14, 1876, see Timothy O’Connor, *Proceedings of the Constitutional Convention held in Denver, December 20, 1875 to frame a Constitution for the State of Colorado* (Denver: The Smith-Brooks Press, State Printers, 1907), 707.


\textsuperscript{14} Ibid., 200.

\textsuperscript{15} Ibid., 200-201.

3, 1891, Congress did so, adopting Kinney’s definition of a forest into U.S. law and granting the President the unprecedented power to declare a forest reserve on land in any State or Territory “wholly or in part covered with timber or undergrowth, whether of commercial or not.” For the first time in U.S. history, forests became spaces within the remit of federal control.

This chapter demonstrates the environmental and historical contingencies that spurred Congress to centralize the control of environments in Washington bureaus by 1891. By exploring the environments and inhabitants of the Intermountain West, it shows why Fernow and others turned to this largely treeless area to inaugurate forest policy by century’s end. Not only were its environments too precious to let settlement throughout the Intermountain West go unchecked. They also served a particular role in maintaining domestic stability throughout the entire United States. As University of Pennsylvania Professor of Public Administration Edmund James (1855-1925) reported to Fernow in 1888, forests acted “as a sponge”, and the cutting of trees and underbrush in the Intermountain West threatened to dry the sources of the first, fourth, fifth, and sixth longest rivers of the United States. Settlement here therefore did not occur in a vacuum and without consequence. Rather, it had major stakes for internal security that necessitated intervention in ways that settler colonialism continues to obfuscate. 1891 was therefore a turning point for U.S. governance. Never before had the President been granted the power to reserve any part of U.S. lands except for military purposes and to relocate Indian bands. And acts of Congress established Yellowstone and Yosemite and General Grant national parks in 1872 and 1890. This new Executive power not only made Intermountain woodlands technologies to regulate U.S. waters, it also made them technologies to transform U.S. statecraft at the end of the nineteenth century. Historians, however, have yet to explore them as such.

While historians Adam Rome and Bathsheba Demuth have argued that Washington instituted what they call an “environmental management state” to balance resource extraction with agricultural cultivation and outdoor recreation during the twentieth century, their concept remains to be elaborated. What follows demonstrates that a myriad of environmental and

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18 While Harold Steen and Nancy Langston note that forest reserves were created to protect watersheds in the United States, they have not pushed this further to view them as a technology for U.S. statecraft. See Harold Steen, The U.S. Forest Service, 56; Langston, Forest Dreams, Forest Nightmares: The Paradox of Old Growth in the Inland West (Seattle: University of Washington Press, 1996), 91.
socioeconomic challenges throughout the Intermountain West led to the creation of the “environmental management state” in 1891. Fernow’s 1888 report provided its conceptual seeds, but it was the region’s environmental and historical contingencies that primed it to become the first laboratory for this new tool of U.S. statecraft. This not only identifies the precise roots of Rome’s and Demuth’s “environmental management state”, it also further challenges historians to acknowledge the material rather than the ideological reasons for incorporating environments into the apparatus of Executive powers by century’s turn. While historians have long argued that environmental management became a tenant of “progressivism” at the turn of the twentieth century, neglecting to identify the Intermountain West as its primary laboratory overlooks why the “environmental management state” remained primarily administered by the Executive and not by Congress. This chapter shows why the “environmental management state” initially materialized to target the Intermountain West, demonstrating that its inauguration in 1891 signaled that Congress and the Executive conceived of the region as a colony whose environments and socioeconomic practices now needed to be administered from the metropole: Washington.

Framing the Intermountain West as a colony and Washington as a metropole sharpens the claim of historian Richard White who has argued that the western United States has historically been “the kindergarten of the modern American state.” Here, White implicitly acknowledges that Washington and the West have long had an incongruous relationship. But what is surprising is that he and other scholars continue to shy from applying the terms “colony” and “empire” when discussing the manifestation state power in the West. The inauguration of the “environmental management state” in the Intermountain West however suggests that Congress and the Executive had begun to experiment with imperial statecraft by 1891. Specifically, it explains why Congress decided to invest the Executive with the power to reserve forests instead of advising Montana, Idaho and Wyoming to craft constitutions that empowered their state legislatures to do so once they became states in 1889 and 1890. The creation of the “environmental management state” in 1891 therefore raised questions about whether Intermountain states held sovereignty over natural resources within their borders in ways that methods in the history of empire helps to clarify. Indeed, as Fernow toned in his 1888 report, attempting to manage woodland resources here had already proven despotic:

while the existing system of espionage and police may be “unpopular and un-American,” as it undoubtedly is, it exists...because there are no adequate provisions made to satisfy the requirements of lumber for actual and commercial use, thus forcing the population into depredations.

Justified as an attempt to feed the needs of a swelling population throughout the Intermountain West, the creation of “environmental management state” in 1891 had its roots in imperial forms of policing and spying found in other late-nineteenth century empires.  

The three individual sections below employ a diverse array of sources to explain why the environments, the indigenous and the non-indigenous inhabitants of the Intermountain West became the objects of this experiment in U.S. statecraft by 1891. First, its environments were especially difficult to inhabit. Composed of mountains, deserts, grasslands, and forests, the storms, avalanches, drought, and fires that befell the region significantly threatened the lives and socioeconomic customs of indigenous and non-indigenous inhabitants alike. Second, its general aridity fashioned the Intermountain West into a characteristically restless region. Water was never certain, and it was this general mobility that brought the indigenous bands of the region to trade and raid with Hispanic settlers upon their arrival in the Intermountain West in the seventeenth century. Their introduction of Andalusian goats, sheep, cattle, and horses by only increased this mobility, as indigenous bands intensified nomadic hunting or adopted pastoralism which Marsha Weisiger defines as “the breeding and herding of domesticated livestock.” With Hispanic settlers undertaking the same practices, nomadism and pastoralism put significant pressure on Intermountain grass that only stoked movement, especially in years of drought. Third, these environmental challenges remained after the United States acquired the region at the conclusion of its war with Mexico in 1848. But it was the U.S. Civil War (1861-1865) and its aftermath that unprecedently confronted Washington with its restless character. The search for gold, the construction of the railroads, a burgeoning meat market, and the Indian Wars of the 1860s and 1870s coalesced to spur major migrations throughout the region during the mid- and late-nineteenth century. But by the 1890s, that restlessness had to be curtailed, and to do so, Intermountain resources required management.

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21 Weisiger, Dreaming of Sheep in Navajo Country, (Seattle: University of Washington Press, 2009), 120.
Relying heavily on reports from the U.S. Census Office, the Department of Agriculture, in parallel with recent geological, meteorological and archaeological studies, what follows correlates scientific data with textual evidence to explore what was at stake in the Intermountain West before 1891. While the environmental historian J.R. McNeill has argued that using recent scientific studies in parallel with archival sources has its own methodological “moonscape of potholes and pitfalls,” he confesses that scientific data in historical research provides opportunities to both say something new about the past and to produce a “fuller and finer history than [historians] have been able to assemble so far.”22 This chapter adheres to McNeill’s premise, showing that the scientific data provided below enriches an historical understanding of the environments and inhabitants of the Intermountain West before it became a laboratory to create the “environmental management state”. Due to its vastness, examples given focus on the environments and inhabitants of the states of Wyoming and Colorado and the territories of New Mexico, Arizona and Utah. Not only do these examples provide a representative of the region prior to 1891, they also present particular facets that distinguished the Intermountain West from the Pacific coast states of Washington, Oregon, and nearly all of California.

These unique examples explain why this chapter uses the term “inhabitants” to refer to both the indigenous and non-indigenous of the region. Indigenous bands had long lived in the Intermountain West before Hispanic settlers arrived in the seventeenth century, and these Hispanic settlers transitioned to inhabitants as their settlements became permanent enough to constitute the Spanish colony and later Mexican state of Nuevo Mexico. After the United States acquired the region following its war with Mexico in 1848, a steady influx of immigrants from Europe, Asia and the eastern United States presented a new batch of settlers unfamiliar with Intermountain environments. It was this unfamiliarity and their attempts to permanently reside in the Intermountain West that made them “settlers”. By 1891, these inhabitants formed a crucible of cultures that were forever shaped by the major transformations wrought by the Civil War and the emergence of industrial capitalism. At its core however was the environment itself whose particularities had long determined the contours of power in the Intermountain West.

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A - Environments of the Intermountain West

The Intermountain region of the western United States is geographically defined by the U.S. Geological Survey today as the area that lays in and between the Rocky Mountains to the east and the Cascade and Sierra Nevada mountain ranges to the west (Map 1.1). It is a generally rugged, striking landscape, composed of an amalgamation of woodlands, mountains, tablelands, deserts and plains that make it one of the most ecologically diverse areas of the North American continent. Due to the mountains that flank its sides, the majority of moisture generated by the Pacific Ocean falls on the eastern slopes of Sierra Nevada and Cascade ranges before it reaches the region. Consequently, the region sits in a perennial rain shadow, giving it an arid to semi-arid climate. As Fernow noted in 1888, water and moisture were most vital here for plant, animal, and human survival, especially as the region holds the largest expanse of deserts in North America and the tenth largest desert in the world.23

But while its arid and semi-arid mountains, forests, tablelands, grasslands, and plains remain its most observable characteristic, the Intermountain West is ironically home to the headwaters of

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23 The largest desert of North America is called the Great Basin Desert, measured at 190,000 square miles (490,000 km²). It qualifies as the tenth largest desert in the world. The Intermountain West also holds entire, or portions of, eight other deserts classified as “cold deserts” for the lack of precipitation that never surpasses an average annual rainfall of 25cm (9.8 inches), and three “hot deserts” classified as such due their lack of precipitation accompanied by average temperatures that vary between 30°C - 50°C (86°F – 122°F).
the most consequential watercourses in the United States. The Missouri, whose headwaters stem from three tributaries within the mountains that span northwestern Wyoming and southwestern Montana, is the longest river of the continental United States and has long served as a highway to pass through the Rocky Mountains. The Colorado and the Rio Grande whose headwaters are found in the Rockies of Colorado determine the geopolitical borders between Arizona the Mexican state of Baja California while the Rio Grande serves as the border between Texas and the Mexican states of Chihuahua, Coahuila, Nuevo Leon, and Tamaulipas. Springing also from the Colorado Rockies is the Arkansas river that flows east and waters more than half of Kansas and Oklahoma as well as central Arkansas before draining in the Mississippi river. But as the Intermountain West lays in a perennial rain shadow, its rivers are not rain-fed. Instead, it is snowmelt that feeds their flows. During the spring and summer months, snowmelt alone accounts for an impressive 70 percent of all runoff in the region. And given the number of watercourses that connect to the region’s mountains and springs, 53 percent of all runoff in the United States west of the Mississippi River derives from Intermountain snowmelt.24

As a number of critical rivers are watered from snows that fall within the peaks that of the Intermountain West, the mountains themselves determine how Intermountain water is distributed throughout the region. A prominent feature of the Intermountain West is the North American continental divide that determines the eastern limits of the region. The continental divide gives the Rockies their distinct height, and due to its height, the divide determines whether water from Intermountain rain and snowmelt will flow west to the Pacific or East to drain in the Atlantic or Gulf of Mexico. In Wyoming, Colorado, and New Mexico, the divide serves as a geological wall between a wetter western side of the divide and an arid or semiarid eastern side. The continental divide is so high, with its highest point at Gray’s Peak in central Colorado registered at 14,278 feet (4,532 meters), that any precipitation that gathers between the Pacific and the divide falls on its western slope, rendering the climate to its east both arid and semiarid. For Aven Nelson, Professor of Botany at the University of Wyoming (1859-1952), the extent of the aridity was notable. Reporting to the U.S. Department of Agriculture in 1898, Nelson noted that environment just east of Wyoming’s southwestern portion of the continental divide was so dry that it contained an 11,000 square mile high-altitude desert or “an

area much larger than the state of Massachusetts.” Today, this is called the Red Desert, a remarkable feature of the southern Wyoming landscape that is peppered with salt desert shrubs and the emblematic sagebrush (*Artemisia tridentata*) that characterizes much of the Intermountain landscape (image 1.2).

But altitude did play a noticeable role in generating the moisture necessary for plant life within the Intermountain West. Prior to 1891, this was most apparent in Colorado whose 830 mountain peaks above 11,000 feet (3,353 meters) accumulated snow and rain along the continental divide that would fall on its western slopes. As State Forest Commissioner for Colorado, Edgar Ensign (1839-1918) reported to Fernow in 1888, the elevated levels of precipitation meant that forests and grasslands grew thicker on the western slope of the continental divide. A unique attribute of these high-altitude mountains that ran along the continental divide was pockets of highly arable called “parks”. Colorado contained four particularly massive parks, with the largest Ensign measuring at one hundred by two hundred miles (161x322 km) or “equal in size to some of the most important of the New England

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Image 1.2 – Artemisia tridentata

Source: U.S. Forest Service, Inyo National Forest, CA, Photo by Sue Weis, not dated

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25 In 1890, the Census Office calculated the area of Massachusetts as 8,315 sq. miles (21,535). Today, it is estimated that the Red Desert is approximately 9,320 sq. miles (24,139km²) or larger than the state of New Hampshire in 1890 (9,305 sq. miles, 24,100km²). See Henry Gannett, “Bulletin No.23 - Area of States and Counties” *Census Office* (Washington D.C.: Census Office, Department of Interior, Jan. 21, 1891), 3. The desert also contains the Killpecker Sand Dunes, the largest living dune system in the United States. For Nelson see, Nelson, “The Red Desert of Wyoming and Its Forage Resources”, *United States Department of Agriculture, Division of Agrostology* (Washington D.C.: Government Printing Office, 1898), 12.

States.” Their size was therefore breathtaking, especially within a single state. The grasses that grew there made them prime spots for settlement in 1891, containing what Ensign noted as “rich grazing lands” with “large and productive agricultural areas” within many of them.

From these park pockets, timber such as Rocky Mountain white pine (Pinus flexilis), Rocky Mountain ponderosa pine (Pinus ponderosa var. scopulorum), and Engelmann spruce (Picea engelmannii) could all be cut for construction and mining. But despite these high-altitude and verdant parks, Ensign stressed that Colorado was a prime example why the environments of the Intermountain West seemed unable to furnish all the needs for settlement throughout the Rockies. In 1888, Douglas fir from Oregon (Pseudotsuga menziesii), loblolly (Pinus taeda) and longleaf pine (Pinus palustris) from Texas and the Gulf states, and red cedar (Juniperus virginiana) from the middle and Atlantic states were being imported for roofing shingles, flooring, and bridge and railway construction. Not all timber growing within the Intermountain West was therefore possible to use for development.

Living high in the mountains, offered both opportunity and presented significant risks. The historian Jeremy Vetter has shown how the Colorado mountains became a particularly rich site for biologists desiring to perform field experiments at high-altitude from the late-nineteenth century onwards. This meant that not only were the environments of the Intermountain West to serve as a laboratory for U.S. statecraft in the 1890s, they were also to become a prime site for scientific investigation. But living high in the mountains was dangerous. As Fernow reported in 1888, “snow-slides are frequent in the Rocky Mountain region, more especially among the higher Colorado ranges,” which sometimes wiped out entire camps or settlements. The effect was dramatic. “Large trees are swept away” Fernow observed, “rocks of many tons weight are torn from their beds, and human beings who are in their path are entombed in the snow, which packs like ice, yielding only to the axe and pick.” But a major issue for Fernow

27 These four parks are north park, middle park, south park, and San Luis Park that run nearly directly north to south through the Rocky Mountain chain of Colorado. Ibid., 116.
28 Ibid., 116.
29 Ensign only described the following tree names as imported to Colorado in 1888: Southern Pine, Red Cedar, Oregon pine, Texas Pine, and New Mexico Pine. It is unclear what is Ensign meant by Texas and New Mexico Pine as these were common names for tree species but not specifically defined. Oregon pine is still a common name used for Douglas Fir, while Texas pine refers most likely to loblolly pine, the most ubiquitous pine of Eastern Texas. Southern Pine can refer either to loblolly or to short longleaf pine, but the distinction is not made here. In 1888 the Colorado Midland railway company imported over 6 million board feet from Oregon, Texas, and New Mexico to rail line that stretched from Colorado Springs in the east, over the Rockies to terminate at Newcastle, Colorado in the west. Ensign, 117-118.
was that avalanches could be caused by life in the mountains itself. “It has also been frequently observed,” he noted, “that a sound, as of a gun, of church bells, of an explosion of mines, etc. may start the snow.”

Settling higher and deeper into the mountains therefore risked to destroy the very settlements that settlers were establishing in the 1890s. Landslides only added to the danger of the mountains. Though less frequent, frost, melting snow, or rainfall – and sometimes all three combined – produced landslides that, “to a beholder, the mass with its accompanying roar, smoke, and fire, would seem to have evoked the lightnings and thunder to aid in its destructive course.”

Avalanches and landslides were the hazards of mountain life, but they were significantly less of a hazard than one other destructive force that was more ubiquitous throughout the Intermountain West: fire.

Indeed, the arid and semi-arid environments of the Intermountain West rendered the region particularly prone to wildfire. As early 1878, explorer and future director of the U.S. Geological Survey Major John Wesley Powell (1834-1902) believed that fire was endemic to Intermountain environments. In a report published for the U.S. House of Representatives, Powell underlined that “only a small portion of the Rocky Mountain Region is protected by climatic conditions from the invasion of fires, and a sufficiency of forests for the country depends upon the control which can be obtained over that destructive agent.” In particular, he claimed to have witnessed “two fires in Colorado, each of which destroyed more timber than all that used by the citizens of the State from its settlement to the present day; and at least three in Utah, each of which has destroyed more timber than that taken by the people of the territory since its occupation.”

What makes wildfire a prominent feature of the Intermountain West an annual meteorological phenomenon called the North American Monsoon. Occurring from July to mid-September, the North American Monsoon produces violent storms that hydrate thirty-five to forty-five percent of the region’s desert areas and sixty percent of the annual precipitation that falls in New Mexico alone. While these storms fill stream beds that provide a local source for irrigation separate from mountain snowmelt, they also generate cloud-to-ground lightning.

31 Fernow, 245.
that spark the fires described by Powell.\textsuperscript{34} As John Leiberg (1853-1913), Theodore Rixon, and Arthur Dodwell of the U.S. Geological Survey would observe in 1904, it was lightning, not suspected sheep herders, that was most responsible for fires in the San Francisco Mountains north of Flagstaff, Arizona. “Electric storms are very numerous in this region during July and August…” they noted, and “when a tree is struck by lightning during a storm of this sort, a fire of more or less severity is sure to follow.”\textsuperscript{35}

But given that fire followed the North American Monsoon, Eugene Hilgard (1833-1916), T.C. Jones, and R.W. Furnas (1824-1905) of the U.S. Department of Agriculture argued in 1882 the monsoon’s rains could limit the spread of fire. Observing wildfires produced in New Mexico, Arizona, and Utah – or what they called “the region of summer rains” – they observed that “any forest fire is likely to receive a severe set back, if not extinction, within a week or two,” if generated in an area that received Monsoon waters. For them, the problem really stemmed from areas receiving little to no moisture as there was, “nothing to check or circumscribe the progress of the destructive element save the exhaustion of the fuel or the intervention of a bare ridge or mountain chain.”\textsuperscript{36} For others, while fire was inevitable in the region, its destructiveness highly depended on where lightning struck. That, however, was unpredictable in 1891.

The environments of the Intermountain West presented a diverse array of possibilities and problems for administrators throughout the 1880s. They were vast, largely arid spaces where water proved to be the most vital asset. Much more than fire and avalanches, aridity posed the greatest threat to sedentary settlement and threatened to weaken the flow the most consequential rivers of the United States. With the demographic explosion of the region, Intermountain environments were under more stress than ever before. Here, the elements seemed posed to thwart the creation of permanent towns and cities, raising questions over how this space could ever become fully integrated into the political and economic fabric of the United States as a whole. For Fernow and others such as E.J. James, Professor of Public Finance

\textsuperscript{34} David Adams and Andrew Comrie describe this characteristic as very similar to the “Sonora Storms” described by Archibald Campbell in southern California in September 1906. For Campbell’s descriptions see “Sonora Storms and Sonora Clouds of California”, \textit{Monthly Weather Review} 34/10 (October 1906), 464. For Adams and Comrie see David K. Adams and Andrew C. Comrie, “The North American Monsoon,” \textit{Bulletin of the American Meteorological Society} 78, no. 10 (October 1997), 2209.


and Administration at the University of Pennsylvania in 1888, the solution lay in protecting Intermountain woodlands so that they could serve as a sponge. As James noted:

where there are forests the interlaced roots of the trees and the mass of leaves above them act as a sponge, which absorbs the water and holds it long enough to enable it to perform its service of quickening animal and vegetable life.\(^{37}\)

Without trees or underbrush, the Intermountain West lacked the technology that made life possible throughout the region. Cutting to build towns and fences, to replace railroad ties, or to burn fires for warmth and industrial production, limited the amount of water stored in Intermountain soils. Consequently, without woodlands, Intermountain soils could not absorb the moisture necessary to grow the region’s primary socioeconomic asset: grass. By 1891, the gradual removal of woodlands now threatened to starve the horses, cows, and sheep that had long served as the socioeconomic core of Intermountain indigenous and non-indigenous inhabitants alike.

\[B - ~ \textbf{The Indigenous of the Intermountain West}\]

Historically, the Intermountain West has been home to over fifty Indian tribes, representing the largest and most diverse demographic of Indian bands in the United States.\(^{38}\) Given the aridity of the region, this was impressive. But a key to their survival were the nomadic or semi-nomadic practices nearly all adopted. With the exception of the Pueblo who had harnessed the flow of the Rio Grande and the rains of the North American monsoon to practice irrigated agriculture, all other tribes throughout the region moved seasonally either in search of food, on the hunt, or guiding their flocks of livestock to find browse.\(^{39}\) What most of these nomadic and semi-nomadic tribes shared however was a common culture that centered on the horse. The Shoshone, the Arapaho, and the Ute all became master riders, while the Navajo mastered horses to shepherd throughout the tablelands of northern New Mexico and Arizona. The horse featured so prominently in the cultures of the Intermountain indigenous that raids for horses became rites to gain manhood and to assert power particularly throughout the Wyoming

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\(^{37}\) Fernow, 26.


mountains and on the southern Great Plains. But what was critical was that neither the horse nor the sheep of the Navajo were native to the region. Rather, they had been brought by Hispanic missionaries and settlers during their conquest of Mexico in the sixteenth century.

The archaeologist William Timothy Treal Taylor and his team have recently revealed the remains of domesticated Iberian horses are found far north as Wyoming’s Red Desert. Dating back to mid-seventeenth century, Taylor’s find confirmed the hitherto supposition that it was the Spanish who first introduced horses to the region in large numbers. After the introduction of the horse, the tribes of the Intermountain West were never same. One striking example comes from the Comanche, a former band of the Shoshone that had long lived in the Wyoming mountains. After moving to the high plans that stretch from southern Colorado to northern Mexico, the Comanche readily transformed their culture around the horse. As historian Pekka Hämäläinen notes, the horse greatly changed not just the Comanche diet, but also Comanche cosmology and their patterns of trade and warfare. Other Intermountain bands adopted similar practices with the horse becoming both a technology and an emblem of the Intermountain West. It facilitated major hunts for wild buffalo that nearly drove one of the most iconic fauna of the region to extinction in the 1880s, and it sustained raiding as an important cultural custom.

But by the mid-nineteenth century, there was a major problem emerging in the Intermountain West: there were too many horses in the region for its environments to feed them. Too many variables needed to coalesce for sufficient grass to grow. The region already lacked water, and the precipitation that did accumulate fell primarily on the western slopes of the continental divide, making the western slope a particularly contested location for grazing. Similar fates befell the Comanche earlier in the 1830s and 1850s, when the inconsistency of forage growth during a prolonged drought starved their horses and loosened their grip over their vast empire. As Hämäläinen argued, this in part explains why the Comanche yielded their empire to a weakened United States still recovering from the Civil War in October 1865.

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43 For the importance of buffalo hunt see Andrew C. Isenberg, The Destruction of the Bison: An Environmental History, 1750-1920 (Cambridge: Cambridge University Press, 2000).
44 The empire of the Comanche was called the Comancheria in Spanish, spreading from northern New Mexico through to Western Texas and northeastern Mexico. See Hämäläinen, “The Politics of Grass” 192, 205-206.
than anywhere, it was in the Intermountain West that indigenous power pivoted on grass. The Shoshone, for example, were forced to reduce their horse herds and abandon hunting as their primary form of subsistence in the 1870s under too much pressure from itinerant shepherds, new settlers, and other Indian bands in the mountains of western Wyoming. To adapt, they adopted sedentary agriculture and bartered a treaty with the U.S. Bureau of Indian Affairs to relocate to the Wind River south of Yellowstone.45

With grass so important in the Intermountain West, alliances throughout the region could be broken and mended on the basis of livestock raiding. This was especially true for the Navajo. After having adopted pastoralism in the late eighteenth century, the Navajo changed their sociocultural practices to center on sheep herding.46 With sheep now a sign of wealth and power, raids to grow the size of flocks became common throughout Navajo lands.47 As James Downs highlights, from 1846 to 1860, the Navajo would steal nearly half a million head of livestock throughout New Mexico choosing particularly to herd them as compared to the Apache who stole nearly just as many, but decided to eat them.48 In some cases, the Navajo conducted raids against their neighbors, the Ute, whose lands stretched between the western Colorado Rockies and the Uintah mountains of eastern Utah. J. Donald Hughes notes that the Navajo and the Ute maintained an “easy peace that was sometimes broken” over reciprocal raids for horse and sheep.49 But mostly, the Navajo conducted sheep raiding on nuevomexicanos or those Hispanics living in the Mexican state of Nuevo Mexico before 1848 or in the U.S. territory of New Mexico following the U.S.-Mexico war of 1846 to 1848.

The Navajo’s sociocultural attachment to sheep raiding however became their ultimate weakness by the U.S. Civil War. As Lance Blythe has recently demonstrated, the Civil War in New Mexico, Arizona, and Utah territories was less an armed conflict between the Confederate States of America and the United States than it was a pretext to enflame a number of smoldering conflicts within Indian tribes themselves and nuevomexicanos. Again, the conflict centered on

45 Harsh weather and locust invasions were what often frustrated agriculture on the Wind River, but as Henry Stamm notes agriculture would eventually become an "addition to their nomadic economic base, not a replacement of it." Stamm, People of the Wind River, 103, 107, 109–13. Quote is from 117.
46 Weisiger, 120.
47 The Navajo not only raided the Ute, they also raided their Pueblo neighbors in the Rio Grande valley of New Mexico. Moreover, they were not only interested in taking livestock. They also took slaves that would either be adopted into the tribe as domestic servants and future shepherds or sold to the Spanish throughout the eighteenth century. See Downs., 13.
48 Downs, 14.
49 Hughes, American Indians in Colorado, 32. For Ute raids on Navajo see Weisiger, Dreaming of Sheep in Navajo Country, 113–21.
grass. With Navajo and *nuevomexicanos* both competing to feed their flocks in the arid tablelands of northern New Mexico territory, the Navajo intensified their raids against *nuevomexicanos* throughout the 1840s and 1850s to either kill competing livestock, or to take slaves that could be used as laborers on Navajo ranches. Upon the outbreak of the Civil War in 1861, *nuevomexicanos* were poised to retaliate. Forming regiments of volunteers under the banner of the Union army, *nuevomexicanos* received the necessary firearms and ammunition to target Navajo sheep and shepherds. Commanded by General Kit Carson (1809-1868), *nuevomexicano* volunteers destroyed crops, set fire to brush, and slaughtered the sheep that to break the Navajo’s socioeconomic backbone. The strategy was simple: starve Navajo sheep and the Navajo will be bound to surrender. By January 1864, Navajo bands began arriving at U.S. Army forts begging for rations. While some bands remained interspersed throughout the rugged and challenging terrain of northern New Mexico and northeastern Arizona, those Navajo that did surrender were taken to Fort Sumner in the central-eastern plains of New Mexico where they would remain until 1868.50

What happened to the Navajo was not unique for the Intermountain indigenous following the Civil War. With buffalo on the brink of extinction and the U.S. Army charged with limiting nomadism throughout the region, Indian bands such as the Arapaho, the Ute, and the southern Jicarilla Apache of southern Colorado were forced onto reservations and forbidden to hunt. As Francis Paul Prucha demonstrates, in order to facilitate their smooth transition to sedentary farming, the U.S. Bureau of Indian Affairs (BIA) issued beef rations to nomadic Intermountain bands to substitute for buffalo meat.51 By 1890, the Arapaho, the Ute, and the Southern Jicarilla still received government issued rations.52 But aware of their attachment to pastoralism, Lieutenant General William Tecumseh Sherman (1820-1891) and Colonel Samuel F. Tappan (1831-1913) approached the Navajo differently. Upon brokering a treaty with the Navajo in 1868, Sherman and Tappan agreed to let the Navajo return to northern New Mexico if the Navajo relinquished the U.S. government from supplying rations. The Army however was to provide goats, sheep, and seed in exchange for the Navajo to rebuild what Carson and

52 Of the 985 registered Southern Ute and Jicarilla on the reservation, 493 were classified as receiving rations, totaling 50.5 percent. See Thomas Donaldson, “Bulletin No. 25 – Statistics on Indians”, 5. For an explanation of the Treaty, see Downs, 15.
the *nuevomexicanos* had razed five years earlier. Sherman and Tappan were not concerned that allowing the Navajo to return to New Mexico would enflame their longstanding competition between *nuevomexicanos* for grass. Rather, they sought to entrust the Navajo to rebuild the self-sustaining existence they had prior to 1864.

Permitting the Navajo to return to their lands on the promise that they would be self-sustaining mirrored what Fernow endeavored to underline later in 1888: the environments of the Intermountain West were difficult to inhabit but they were not impossible to settle. Nevertheless, the region’s climatic characteristics seemed unheeded by lawmakers seeking to enact a general policy to transform the Intermountain indigenous into farmers. The belief that environments, no matter their composition, could be turned into self-sustaining settlements was most manifest one year prior to Fernow’s report with the enactment of the Dawes Act on February 8, 1887. Named after its author, Republican Senator Henry Dawes of Massachusetts (1875-1893), the Act authorized the distribution of individual parcels of land to indigenous registered on a tribe’s official roll. The objective was to encourage self-subsistence farming on these parcels, but the arid and semiarid environments of the Intermountain West, especially the arid Navajo reservation, significantly frustrated sedentary farming in a region distinct for its lack of rainfall. Navajo pastoralism therefore seemed to provide a middle ground given that they developed their own local economy around the practice.

But by the 1880s, Intermountain environments did more to frustrate Indian policy executed from Washington than they helped accomplish it. As Virginia McConnell Simmons reveals, despite the enactment of the Dawes Act, the Ute in the arid Uintah mountains of northeastern Utah, defied allotment and continued to practice nomadic hunting because arid conditions often forced the Ute to move within and out of their reservation boundaries. Moreover, as Louis Warren argues, Intermountain environments exacerbated ill-will towards BIA administrators and U.S. Army officers throughout the decade. As he demonstrates, a streak of droughts affecting the region served as direct cause of the spread of the Ghost Dance movement from the Great Basin of the Intermountain West to South Dakota where it captivated

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54 Ibid., 210. For hunting off the Uintah reservation see 204-205.
the Sioux and subsequently led to their massacre at Wounded Knee on December 29, 1890.\textsuperscript{55} If Indian policy was to make sedentary farmers of the Intermountain indigenous, it overlooked the region’s environmental particularities further frustrating its initial objectives.

But the most evident challenge for the BIA agents and army officers throughout the Intermountain West was that all tribes spoke a different language. Indeed, while this linguistic diversity made the region a playground for ethnologists, it was blamed by BIA Commissioner Thomas Jefferson Morgan in 1892 for impeding any sort of governance over the Intermountain indigenous.\textsuperscript{56} For Morgan, “the Bannacks and Shoshones at Fort Hall, the Southern Utes in Colorado, the Apaches, or the Navajoes of Arizona, people who for the most part, speak no English… and a constant menace to thousands of their white neighbors” were a “hindrance to civilization and a clog on our progress”.\textsuperscript{57} In a region where three separate language families overlapped and where separate dialects of each family were spoken by various bands, Morgan astutely observed the Intermountain West was going to prove complicated to administer.\textsuperscript{58}

By 1891, the indigenous of the Intermountain West were facing several problems. First, for those still practicing pastoralism like the Navajo, the grass available to horses and sheep was under more and more stress, especially in the wake of the droughts of the 1880s. Second, as the Census agent Thomas Donaldson recorded in 1890, 22 percent of the entire Intermountain indigenous population was receiving government rations with percentages as high as 62 percent in Utah and 50 percent in both Colorado and Wyoming. Third, both legislators and administrators in Washington such as Henry Dawes and Thomas Jefferson Morgan struggled to understand the environments of the Intermountain West and the languages of the indigenous that lived there. As will be discussed in subsequent chapters, forestry provided a solution to these problems. It not only provided the apparatus to surveil and police grazing, it also introduced the Intermountain indigenous to forest and water management that was adapted to the environmental particularities of each Indian reservation. With the inauguration of the “environmental management state” in the Intermountain West in 1891, administrators were

\textsuperscript{58} The Shoshone spoke a dialect of Uto-Aztecan, the Jicarilla Apache or Southern Ute spoke a dialect of Athabaskan as part of the Na-Dene language. The Arapaho spoke a dialect of Algonquin, part of the Algic language family.
addressing not just resource use its inhabitants, they were also addressing the administrative challenges to enacting Indian allotment policy. Consequently, the “environmental management state” served as a covert means to both surveil and make sedentary life possible for the Intermountain indigenous who had long been accustomed to moving throughout the region.

**C - The Inhabitants of the Intermountain West**

In 1891, the Intermountain West was the fastest growing region of the United States. While U.S. Census Superintendent Robert Porter reported to Congress that the West had grown a staggering 71.27 percent in a decade, the states and territories that Fernow noted as the West’s Intermountain region grew 87.8 percent from 591,353 souls in 1880 to 1.11 million in 1890.59 The numbers were impressive, and they confirmed Fernow’s claim that the individualistic “pioneer days” were yielding to a denser, more social living throughout the United States. The growth of Colorado alone was the remarkable. Nine of its twenty most populated cities and towns recorded in the 1890 census had been created in a single decade. Three of them – Grand Junction city, Aspen city, and the town of Durango – all held populations over two thousand, with Aspen alone counting 5,108 inhabitants.60 Considering that avalanches often swept through the city with Fernow noting two as particularly deadly in 1884 and 1886, it seemed extraordinary that so many were attracted to the mountains.61 But most astounding was the growth Colorado’s capital. Between 1880 and 1890, the city of Denver grew 200 percent from just 35,620 inhabitants in 1880 to 106,713 in 1890. Situated at 5,300 feet (1,615m) above sea level, Denver displayed the promise of the Intermountain West.62

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59 The population of the Intermountain West was more than the number provided here as this calculation does not account for southern California. They however account for populations recorded from the states of Colorado, Montana, Idaho, and Wyoming and the territories of New Mexico, Arizona, and Utah in 1890. Bulletin No. 165, Population of places having over 1,000 inhabitants or more in 1890*, Census Bulletin (Washington D.C.: Census Office, Department of Interior, February 19, 1892), 19.

60 Aspen was the most populated city on former Ute reservation lands. It was then followed by Durango with a population of 2,726 and just north of the Southern Ute reserve. The least populated, but nonetheless budding was Grand Junction with a population of 2,030 and twenty-six miles (43km) from the border with Utah Territory. “Bulletin No. 127, Population of Colorado” Census Bulletin (Washington D.C.: Census Office, Department of Interior, October 24, 1891), 2.


62 For the elevation of Colorado measured in 1888 see Ensign “Report on the Forest Conditions of the Rocky Mountains”, 100. For the population of Denver, see “Bulletin No. 127”, 2.
What attracted this massive influx of migrants to Colorado were the mountains themselves. Census Geographer Henry Gannett (1890-1900), Superintendent Porter, and Special Agent William Hunt, noted as much in their report entitled “Progress of the Nation, 1790 to 1890.” As they attested, “of all the states and territories of the Cordilleran [mountain] region, Colorado has made the greatest stride during the decade.”63 Between 1880 and 1890, they noted that the state had grown:

from a narrow strip of settlement extending along the immediate base of the Rocky Mountains, the belt has increased so that it comprises the whole mountain region, beside a great extension a great extension outward upon the plains. The increase is the result of the discovery of very extensive and very rich mineral deposits about Leadville, producing a “stampede” second only to that of 1849 and 1850 to California.64

This “stampede” of migrants to the Rockies was what Gannett, Porter, and Hunt found most astonishing. Using a vivid comparison, they likened especially miners to legions of insects that “spread all over the whole mountain, till every range and ridge swarms with them.”65 By 1891, it was evident that the Rocky Mountains had brought the “pioneering days” of Colorado to an end.

The allure of the Colorado Rockies lay in the rich deposits of gold, silver, and coal lodged within its stone. Undergoing their first rush in 1859, the mountains became home to 100,000 miners in search of gold between what is now Denver and Colorado Springs.66 By 1889, Colorado mines were producing $30.2 million worth of gold and silver combined, being...
by far the largest producer of precious metals in the Intermountain West. Silver alone accounted for 73.2 percent or $26.5 million. But if anything was to serve as the backbone for an industrializing Intermountain West, it wasn’t gold, nor silver. It was coal. Ranking first in the entire Intermountain West, Colorado produced 2.6 million tons alone in 1889 valued at $4 million. If the engines of locomotives, electricity generators, or manufacturing machines were turning in the Intermountain, chances were that they were fired by coal mined from the Colorado Rockies.

But what this bustle of mining activity masked is that it all hinged on water. And lots of it. As Andrew Isenberg and Raymond Dumett note, the decade of 1880 to 1890 represented an aptly termed “mining revolution” in the history of mining, during which Isenberg stresses that “independent prospectors’ tools such as pans, picks, and shovels rapidly gave way to the machines of hydraulic mining.” Hydraulic mining was part of an array of mining technologies that, as Dumett argues, made it possible to extract “far higher yields of valuable minerals from their parent rock than were ever possible in earlier ages.” Placer mining – or mining that runs or blasts water through gravel and silt to separate them from gold and other minerals such as gem stones – was widely employed throughout the state, using the spring and summer snowmelt that fed its 158 rivers. As Isenberg notes further, “impounding water was a necessary precondition for the development of the single most important technology in the exploitation of placer deposits…” That technology was the pressurized hose.

But water in the Rockies was an inconsistent resource, a problem that had preoccupied Colorado territorial administrators from the start. When the forty framers of the Colorado State Constitution submitted their draft for Congressional approval in 1876, they incorporated Section 5, Article XVI declaring that “the water of every natural stream, not heretofore

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67 The second largest producer of precious metals in 1889 was Montana who produced more gold than Colorado, but less silver, valued respectively at $3.8 million and $20 million or $23.8 million overall. William Windom, “Report of the Director of the Mint upon the Production of Precious Metals in the United States during the Calendar Year 1889” United States House of Representatives 51st Congress, 1st Session, No.354, (Washington D.C.: Government Printing Office, 1890), 22.


70 Dumett, 5.

appropriated, within the State of Colorado, is hereby declared to be the property of the public, and the same is dedicated to the use of the people of the State.” 72 This was significant. Upon becoming a state on August 1, 1876, Colorado also became the first state to incorporate a water property clause as a state constitutional article. In other words, in 1876, Congress acquiesced in granting Colorado the legal authority to establish its own “environmental management state”. By the 1890s, this proved problematic. With Colorado being an upriver state, its mountains bear the sources of the Rio Grande, the Colorado, and the Arkansas rivers. Not only are these the fourth, fifth, and sixth longest rivers of the United States they also traverse several states to discharge either into the Gulf of California, the Gulf of Mexico, or the Mississippi River. If the growth of Colorado continued at such a staggering pace, its inhabitants and industry threatened to close the water tap to downriver states such as Kansas or the territories of New Mexico and Arizona. As Kimberly Smith notes, this came to a head a decade later in 1902 when Kansas sued Colorado over the flow of the Arkansas river, initiating a five-year investigation that ultimately determined that diverting water for farming in Colorado superseded ensuring that the Arkansas maintained its flow throughout central Kansas. 73 By century’s turn, Colorado could employ its own “environmental management state” to exert power over other states.

While the demographic growth of Colorado had tapped the water and mineral resources of the Rocky Mountains, the territories of New Mexico, Arizona, and Utah revealed a different situation. Indeed, all three remained some of the least populated places of the United States in 1891, with none having a population superior to that of the District of Columbia. 74 Closest to D.C. in 1891 was Utah with 207,905 inhabitants, with entire territory just surpassing the manufacturing city of Milwaukee by a mere 3,437 residents. New Mexico followed with 153,593 inhabitants while Arizona Territory was the second least populated jurisdiction in the entire United States, counting 59,620 residents which was a mere 1,811 shy of the population

72 Article XVI, section 5, The Constitution of the State of Colorado Adopted in Convention March 14, 1876; Also the Address of the Convention to the People of Colorado (Denver: Tribune Book and Job Printing House, 1876). For a list of delegates to the Colorado Constitutional Convention of December 20, 1875 to March 14, 1876, see Timothy O’Connor, Proceedings of the Constitutional Convention held in Denver, December 20, 1875 to frame a Constitution for the State of Colorado (Denver: The Smith-Brooks Press, State Printers, 1907), 707.


of Wilmington, Delaware, the largest city in the second smallest state of the United States.\textsuperscript{75} This revealed a major demographic disparity within the Intermountain West in 1891. New Mexico, Arizona, and Utah hardly attracted excitement as territories to migrate to.

But what New Mexico, Arizona, and Utah territories did have was demographic diversity. For one, this portion of Intermountain West retained strong ties to its Hispanic past. With the conclusion of the Treaty of Guadalupe Hidalgo that ended the U.S.-Mexico war in 1848, Article VIII of the treaty enabled the Hispanic inhabitants of Nuevo Mexico and Hispanic owners of property in Nuevo Mexico to retain their previous titles to land.\textsuperscript{76} The distinction was important, as Article VIII stipulated that the United States legally respect the property rights of both Mexican residents of Nuevo Mexico and “Mexicans not established there.” Furthermore, this inviolably applied to their heirs. In other words, upon establishing New Mexico as a U.S. territory, U.S. law was required to recognize existing property claims of resident and non-resident property owners.\textsuperscript{77} Consequently, this made New Mexico a node of the Hispanic world, whose inhabitants included property owners resident anywhere throughout the former Spanish empire.

By 1891, the vestiges of this Hispanic heritage remained visible in New Mexico, Arizona, and Utah. This was so much the case that when Congress established a court of private land claims for New Mexico, Arizona, and Utah on March 3, 1891 – the same day that provided the legal framework for the federal “environmental management state” – Section I of the act stipulated that all land claim notices be published in English and Spanish, and circulated in both

\textsuperscript{75} The population of Wilmington, Delaware in 1890 was 61,431 inhabitants. See “Bulletin No. 165 - Population of Places having 1,000 inhabitants or more in 1890”, \textit{Census Office}, (Washington D.C.: Department of Interior, February 19, 1892), 21. For the population of New Mexico, Arizona, and Utah see “Bulletin No. 16, Population of the United States by States and Territories: 1890,” \textit{Census Office} (Washington D.C.: Department of Interior, December 12, 1890), 4-5. For comparisons to city populations see “Bulletin No. 165, Population of places having over 1,000 inhabitants or more in 1890”, 6, 14.


\textsuperscript{77} As Carol Raish and Alice McSweeney highlight, Article VIII would later prove to be a legal imbroglio for foresters to determine which Hispanos held land and water claims in the region, especially as some claims either dated to the era of Spanish colonization or they were held by claimants who long resided outside Nuevo Mexico. See Raish and McSweeney, “Land Grants and the U.S. Forest Service”, \textit{Natural Resources Journal} 48/4 (Winter 2008), 1039-1055. There is exhaustive literature on the land grant systems of New Mexico and Arizona. For a solid overview see the articles presented in Charles L. Briggs and John R. Van Ness eds., \textit{Land, water, and culture: new perspectives on Hispanic land grants} (Albuquerque: University of New Mexico Press, 1987). See also Manuel Garcia, “Persistence and Disintegration: New Mexico’s Community Land Grants in Historical Perspective”, \textit{Natural Resources Journal} 48/4 (Winter 2008), 847-856, and Anita Huizar-Hernandez, \textit{Forging Arizona: A History of the Peralta Land Grant and Racial Identity in the West} (New Brunswick, NJ: Rutgers University Press, 2019).
a local newspaper and a one circulating in the capital of the territory.\textsuperscript{78} Doing so was necessary, as a quarter of all foreign-born inhabitants in New Mexico, Arizona, and Utah territories claimed to have been born in Mexico.\textsuperscript{79}

Given the Hispanic influence on the region, and with their property rights respected in U.S. law, creating the “environmental management state” in the Intermountain West required a deft sensitivity to Hispanic customs and a solid grasp of U.S. land law. This was particularly true regarding water rights in New Mexico which, as Eric Perramond and Maurice Crandall highlight, has a history dating prior to the arrival of Hispanic settlers in the seventeenth century. When Hispanic colonists first arrived and began to administer the region, they noted that tribes such as the Akimel O’odham (River People), the Tohono O’odham (desert people) of Arizona, as well as the Pueblo, and the Navajo all held formal elections to elect ditch captains who were responsible for governing a communal system of irrigation canals. Hispanic colonists called this system an *acequia*. This ditch-captain, called *mayordomo* in Spanish, was responsible for determining who received water and how much, when canals would be opened and closed, and, when necessary presided over disputes. The existence of another elected – though subordinate – position reveals just how important water management was to exercise governance throughout the region well before even the creation of New Mexico territory. Hispanic colonists termed this position a *paricante* or the primary person responsible for organizing the regular cleaning of an acequia. Hispanic settlers in *Nuevo Mexico* considered this complex system of water management so efficient that they incorporated as a regular sociopolitical practice that has endured as an emblematic feature of local New Mexico politics ever since.\textsuperscript{80}

Second to water, grass was primordial for the economic welfare of the Intermountain West. As Census agent Mortimer Whitehead recorded in 1890, a combined 2.4 million sheep and 1.79 million cows grazed ranges in New Mexico, Arizona, and Utah territories. This

\textsuperscript{78} Congress enacted this legislation on March 3, 1891, the same day as the General Revision Act. “An act to establish a court of private land claims, and to provide the settlement of private land claims in certain states and territories” U.S. Statutes at Large, 51st Congress, <https://www.loc.gov/item/llsl-v26/> (accessed Sept. 16, 2023), 854-855.

\textsuperscript{79} Porter recorded 24,181 people claiming to have been born in Mexico in 1890. With 770,910 counted as foreign-born in the Intermountain West, this accounted for 25.56 percent of all foreign-born in the region. Calculated from Porter, “Bulletin No.357 - The foreign-born population distributed according to country of birth: 1850-1890”, *Census Office* (Washington D.C.: Department of Interior, February 16, 1893), 6.

accounted for 50.8 percent of all sheep and 58.4 percent of all cattle in the entire Intermountain region. New Mexico alone counted an impressive 1,054,022 heads of cattle and 1,125,524 heads of sheep in 1890, ranking second in the United States just behind Texas and Eastern Oregon respectively.\(^8\) With such high numbers however, the fight between sheep and cattle herders for pasture was repeatedly enflamed throughout the region especially in years of drought. The locally-known “Great Die Up” in the high plains of Wyoming during the winter 1886-1887 proceeded a drought that had already forced ranchers from the Great Plains, Colorado, Utah, and New Mexico to search for what Mortimer Whitehead observed as the “very nutritious” buffalo grass \(\textit{boumeloua dactyloides}\).\(^8\) W. Turrentine Jackson notes that the stress was too much for Wyoming ranchers with some losing 60 to 70 percent of their herds.\(^8\) The “Great Die Up” spelled the end of Wyoming as what contemporaries called “the Cattleman’s Commonwealth” in the mid-1880s, but it did highlight the hardiness of sheep in the region, an aspect long appreciated by the Navajo.\(^8\)

By 1890, similar to the minerals of Colorado, sheep had become emblematic of the Intermountain West. Following the “Great Die Up”, sheep were considered a better investment than cattle in the Intermountain West because they out-ate cattle in the arid grasslands of the region. As Mortimer Whitehead noted in 1890, “cattle will not feed where sheep have grazed,” and their ability to both eat desert forage such as common flowering stork’s bill \(\textit{Erodium cicutarium}\) and to survive on less water, made them particularly adept to Intermountain environments.\(^8\) able to be well-fed on desert forage such as common flowering stork’s bill \(\textit{Erodium cicutarium}\), and second, needed less water for hydration. Indeed, by 1890, the churro and merino sheep breeds that originated from arid Andalusia and were introduced to the Navajo and other indigenous of the region by Hispanic settlers had now occupied 2,185 shepherds in New Mexico, 1,550 in Arizona, and 818 in Utah alone. Wool clip from Utah totaled just over

\(^{8\text{1}}}\) Whitehead, “Bulletin No. 117, Livestock on Ranges”, 5-6. It is unclear if Mortimer’s calculation included the number of sheep on the Navajo and Hopi reservations in 1890. If it did not, then this number and percentage would be much larger.

\(^{8\text{2}}}\) Whitehead, 8.


\(^{8\text{4}}}\) “Cattleman’s Commonwealth” is cited by Jackson. See \textit{Ibid}, 260.

an impressive 5 million pounds (2.2 million kilos) from its 922,730 sheep.\footnote{Utah clipped 5,025,263 pounds (2.2 million kilos) of wool in 1890. Eastern Oregon is also part of the Intermountain West but has not been explored here as its environments and economic activities are identical to the environments and economic sectors already presented throughout this chapter. For statistics see “Bulletin No. 117, Livestock on Ranges”, 5-6, 8.} New Mexico, clipped 3.9 million pounds (1.7 million kilos) in 1890, and given that it was 1.1 million pounds less than that of Utah despite a registered 1.1 million sheep suggests that churro lambs, ewes, and wethers were also raised for milk and mutton in the territory.\footnote{Ibid.} By June 1891, sheep had become such a common sight in the Intermountain West that Fernow could confidently write to his fresh twenty-five-year-old recruit to the USDA Division of Forestry, Gifford Pinchot, asking how he was doing on assignment “in the wooly west.”\footnote{Ibid.}

But the transition to shepherding did not occur without resistance from cattle ranchers throughout the region. As historian Jimmy Skaggs notes, competition for grass continued well into the early twentieth century, creating the Intermountain West into an enduring battlefield for forage.\footnote{Skaggs highlights that cattle herders attacked shepherders in Gunnison National Forest in the Uncompahgre River Valley of Intermountain Colorado as late as during World War I. Jimmy M. Skaggs, \textit{Prime Cut: Livestock Raising and Meatpacking in the United States, 1607-1983} (College Station: Texas A&M University Press, 1986), 66, 68.} Addressing the lack of grass therefore became crucial to secure settlement and achieve settlement policy objectives executed from Washington. Forestry offered the possibility to do so. With trees and underbrush critical to storing the water vital for human and plant life throughout the region, forestry became the science by which forests could be employed as a technology for settlement in the Intermountain West. To achieve that however required serious knowledge of Intermountain environments and its indigenous and non-indigenous inhabitants. The U.S. Census, the Department of Agriculture, and the Department of Interior were on the cusp of understanding the Intermountain West in 1891, but the creation of the “environmental management state” and the inauguration of forestry as its first tool, laid the foundation to investigate and surveil the region further into century’s turn.

\section*{Conclusion}

Intermountain West presented unique environmental, demographic, and socioeconomic challenges to administrators in Washington by 1891. Not only was it the region witnessing the
most dramatic burst in population. It was also home to both the largest concentration of Indian reserves and the sources of several of the most consequential rivers of the United States. But it was also here where its arid and semi-arid mountains, deserts, high plains, and tablelands displayed their power to check human industry. Droughts and blizzards, mountain avalanches, and lightning from the storms of the North American Monsoon, threatened to impede sedentary settlement throughout a region that measured larger than all the Atlantic states combined. In order to sustain the region’s socio-economic attachment to pastoralism, as well as the glittering prospects for precious metals and minerals that abounded within its mountains, officials in Washington envisioned the Intermountain West as the prime experimental ground to establish the “environmental management state” in 1891.

Internal security depended on it. Indeed, it was in the Intermountain West that both life and power hinged on water and grass. The Shoshone, the Navajo, and the Ute knew as much themselves, being long forced to move throughout region when pasture for their horses, sheep, and cattle went dry. It was the U.S. Civil War (1861-1865) however that initiated both an administrative and a military campaign to the transform the nomadic character of the Intermountain West by negotiating and, in most cases, forcing Intermountain indigenous bands onto reservations. By 1891, the allure of grass, gold, and precious minerals to the Intermountain West led to bloody bouts of revenge and retaliation between indigenous and non-indigenous sheep and cattle herders, while hydraulic mining seriously tested the limits of water in a region primarily watered by snowmelt. Fires only exacerbated the anxiety felt in Washington, itself a perennial threat to settlements and the budding towns and cities of the region. If the Intermountain West was ever going to fully transform from a region largely characterized by movement to one that could accommodate more migrants for sedentary life, then its environments needed to be understood and controlled.

Forestry was to become the science to attempt just that. But there was a caveat. Upon becoming a state in 1876, Colorado codified its own “environmental management state” while New Mexico clung to local customs of water management that existed since before the seventeenth century. Moreover, when the Treaty of Guadalupe Hidalgo granted all Hispanos from Nuevo Mexico to retain their property rights in 1848. Implementing forestry here was therefore going to prove to be a legal conundrum especially in the state of Colorado whose booming gold, silver, and coal mines made it both wealthy and particularly influential on Capitol Hill. Nonetheless, it was in New Mexico and Arizona territories where federal forest
policy had the least chances of facing strong legal resistance given their status as territories until 1912. As the historian Earl S. Pomeroy (1915-2005) would note later in 1947, territories in the United States are political jurisdictions administered with direct oversight by Congress and the Executive. In other words, New Mexico and Arizona would lack the sovereignty required to challenge forest policy either before or after it was implemented in their territories. While this would bring Pomeroy to argue that territorial governance in the United States actually mirrored imperial colonization, given that most states composing the Intermountain West in 1891 were only just admitted as states in 1889 and 1890, their youth and lack of population gave them less of a means to politically challenge forestry than Colorado. The environments of the Intermountain West would therefore not only became an experiment ground to establish the U.S. “environmental management state”, they also became the experiment ground to test the extent to which the Executive and Congress could implement imperial statecraft.

This chapter has explored the environments and inhabitants of the Intermountain West before 1891 to better understand what would shape forest policy in the United States in the coming decades. It was here, a region that already teemed with indigenous bands, Hispanics, herders, and miners, where the crucible for science and administration was most visible at the close of the nineteenth century. And it was the forest reserve that would serve as the prime tool that officials in Washington employed to expand their authority in the 1890s. The Intermountain West is therefore considered as distinct from the rest of the West by 1891. In no other part of the West were concerns over water and grass so acute, and in no other part of the West was Congress and the Executive more poised to intervene with bureaucrats to sustain settlement in environments that seemed hostile to it. Nonetheless, establishing the “environmental management state” was an exploratory experiment, one that required a redefinition of a forest according to its function rather than its appearance, as well as serious political and legal football

90 New Mexico was granted statehood on January 6, 1912 while Arizona was granted statehood on February 14.
91 The three executive bureaus charged with administering the territories of the United States in 1891 were the Department of State, the Treasury Department, and the Department of the Interior. The Department of State was most responsible for finding appointments for territorial governors, secretaries, clerks, and judges that politically administered a territory and kept its records. The Treasury directly administered territory finances and budgets, while the Department of Interior was managed land, Indian affairs, and surveil territorial commerce. See Earl S. Pomeroy, The Territories and the United States, 1861-1890: Studies in Colonial Administration (Philadelphia: University of Pennsylvania Press, 1947), 4–5, 7-8, & 16-21.
92 Half of the states composing the Intermountain West in 1891 were granted statehood between 1889 and 1890: Montana (November 8, 1889); Washington State (November 11, 1889); Idaho (July 3, 1890); and Wyoming (July 10, 1890). For Pomeroy see, 106. Timothy Lindberg has made a similar argument in his examination of Utah territory. See “Subduing the Mormons in Utah Territory: Foundation for the Insular Cases,” Journal of Policy History 32:1 (January 2020): 52–77.
to justify its creation. Consequently, securing forest management as an implement of U.S. statecraft became a political and administrative battle that raised several questions about the extent and limits of state power of the twentieth century. This is examined in Chapter 2.