The Weedy West: Mobile Nature, Boundaries, and Common Space in the Montana Landscape

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The movement of weeds across human boundaries, and collective responses to that movement, created a common geographic space in which people adjusted parceled land to the exigencies of transboundary ecology. Examining the weed commons in Montana illuminates a shift in the 1930s toward the cooperative management of rural western landscape.

By December 1937, Hugo Zehrfeld, a farmer near Forsyth, Montana, was beside himself with anger at his neighbor. In May, the neighbor had plowed his field, but failed to plant a crop. As spring turned to summer, the bare soil sprouted a lush growth of Russian thistles, "as big as balloons," in Zehrfeld's words. Autumn arrived, and the thistles died and turned brown, dry, and brittle. Winter winds broke their stalks. Tumbleweeds now, they bounced along the ground, skipped over and under a two-wire fence, and rolled onto Zehrfeld's land. They stacked against his shelterbelt. In places on his fences, they snagged in such numbers they pulled down the wires. Worst of all, they scattered their seeds on a field that Zehrfeld had disked in preparation for a spring planting of alfalfa. Zehrfeld had tried to get his neighbor to destroy the thistles before they began tumbling, but the man had refused to cooperate. As Zehrfeld told it, "[W]ell he just laughed in my face." Alas, there was little that Zehrfeld could do. A lawyer might have helped, but Zehrfeld had no money. Drought and economic depression, the very conditions that probably caused the neighbor to let his field go to weeds, had prevented Zehrfeld himself from bringing in a crop—and profits—for eight years running. So the situation stood: a frustrated, bitter Zehrfeld on one side of the property line, a stubborn, negligent neighbor on the other, and Russian thistles tumbling between them.[1]

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[1] Hugo Zehrfeld to Ralph Mercer, 17 December 1937, Weeds 1937 file, box 35, acc. no. 72043, Montana State University Extension Service Records (hereafter, ESR), Merrill G. Burlingame Special Collections and University Archives, Renne Library, Montana State University-Bozeman (hereafter, MSU).

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This story illustrates a significant, but overlooked, problem in the land-use history of the American West: the incompatibility of human boundaries and forms of mobile nature—water, soil, and organisms—that those boundaries could not contain.[2] In part, Hugo Zehrfeld lived in a regimented landscape in which fences objectified the abstract divisions that separated one parcel of ground from another. The basis for this geography developed long before, when European peoples migrated around the planet, wrested territory from native inhabitants, and engaged in fierce competition to establish property rights in nature. The Great Land Rush, as historian John Weaver has called it, yielded colonized landscapes of increasingly rigid boundaries and tightly controlled spaces.[3] In the United States, the 1785 Land Ordinance arranged the nation's western regions into rectangular townships, sections, half-sections, quarter-sections, and acres, a "systematic grid of power," to borrow geographer Derek Gregory's phrase, that enabled the efficient administration, privatization, and control of particular units of land. The grid, for example, delineated plots in which farmers such as Zehrfeld harnessed biological processes—growth, maturation, and decay—in the service of capitalist production. In theory at least, the grid created differentiated, enclosed spaces, a simplified landscape in which the domains of federal, state, and local agencies, corporations, and individual landowners stood apart from one another, autonomous and self-contained.[4] Thus, the imposition of straight edges and right angles came to define Hugo Zehrfeld's land and life.

But as the tumbleweeds demonstrated, uncontrolled mobile nature could disrupt that rigid structure and, along with it, the expectations of its inhabitants. The grid proved porous and not all-powerful; PERHAPS, EVEN, IT OBSTRUCTED PROGRESS. An array of substances and organisms passed through it. Some of these were weeds: plants that thrived in disturbed ground, reproduced prolifically, and frus-

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[2] Theodore Steinberg's *Slide Mountain, or, The Folly of Owning Nature* (Berkeley, 1995), is one of the few historical works on the incompatibility of nature and property. I am especially indebted to Hildegard Binder Johnson, "Rational and Ecological Aspects of the Quarter Section: An Example from Minnesota," *Geographical Review* 47 (July 1957): 330–48. By boundaries, I mean those landscape divisions that people impose. On human and natural boundaries, see Richard T.T. Forman, *Land Mosaics: The Ecology of Landscapes and Regions* (Cambridge, GB, 1995), 81–112, 364–402.

[3] John C. Weaver, *The Great Land Rush and the Making of the Modern World, 1650–1900* (Montreal, 2003).

[4] Derek Gregory, "Modernity," in *The Dictionary of Human Geography*, ed. R.J. Johnston et al., 4th ed. (Oxford, GB, 2000), 512–6 (quote on 514); Kate Brown, "Gridded Lives: Why Kazakhstan and Montana Are Nearly the Same Place," *American Historical Review* 106 (February 2001): 17–48; John Opie, *The Law of the Land: Two Hundred Years of American Farmland Policy* (Lincoln, 1987), xi–xxi, 1–42; James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven, 1998), 1–52, 262–305. By space, I mean the shifting, culturally-defined distribution of things in relation to one another across the earth's surface. Derek Gregory, "Human Geography and Space," in *Dictionary of Human Geography*, ed. Johnston et al., 767–73, discusses the concept.

trated human efforts to control nature.[5] Carried by wind, water, animals, vehicles, and other means, weeds easily moved from place to place, across a multitude of boundaries, sowing disorder along with their innumerable seeds. For crops and livestock, the organisms of controlled, privatized agricultural production, the fence separating Zehrfeld and his neighbor did matter, but in terms of the totality of life that swirled across the landscape, that same structure acted as a "biological sieve," in historian Thomas Dunlap's words, constraining the domesticated but allowing, if not actually assisting, the movement of weeds and other things.[6] Zehrfeld was a man of the grid, but Russian thistles confounded the logic of his landscape and made a mess of his agricultural ambitions. A German immigrant who arrived in Montana during the concluding phase of the Great Land Rush, he became one of that epic movement's final victims. Rather than profiting from the grid, Zehrfeld found himself trapped behind its wire fences. The geography that was supposed to help him realize his dreams turned out to be a prison of poverty, despair, and defeat.

But for other Montanans in similar weedy predicaments, all was not lost. These people may have shared some of Zehrfeld's misery, but they did not necessarily share his fate. They recognized the possibility of an alternative outcome to the dilemma of mobile nature crossing the grid. Transboundary movement could be profoundly unsettling to the desired spatial order, but it also carried enormous potential for spatial—and social—transformation. When weeds spanned boundaries, they put at risk the fiction that the grid separated one unit of land from another, and they challenged the individualism that motivated the drive to create exclusive private property. When, for example, the wind pushed tumbleweeds across a property line, those plants did not simply scatter thousands of seeds on exposed soil. In slipping through the grid, in casting seeds on both sides of a boundary, they began to open a landscape defined less by linear divisions than by the shared experience of ecological connections. That ecological landscape presented opportunities for neighbors to work together to overcome mutual problems. Zehrfeld perhaps glimpsed such an opportunity when he appealed to his neighbor to destroy Russian thistles. But the man refused his entreaty, and the potential for coordinated action went unrealized. In other cases, Montanans fully recognized the existence of a landscape in which people must cooperate. Compared with Zehrfeld and his neighbor, they saw things whole. Their experience, more than Zehrfeld's, requires explanation.

Using Montana as a case study, this essay examines the spatial consequences that followed from the intersection of mobile nature and the grid in the American

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[5] On western weed history, see Frieda Knobloch, *The Culture of Wilderness: Agriculture as Colonization in the American West* (Chapel Hill, 1996), 113–45 and Clinton L. Evans, *The War on Weeds in the Prairie West: An Environmental History* (Calgary, 2002). On weed characteristics, see Robert L. Zimdahl, *Fundamentals of Weed Science*, 2nd ed. (San Diego, 1999).

[6] Thomas Dunlap to Mark Fiege, 12 April 2000 (letter in author's possession).

West. When weeds crossed boundaries, landholders had a choice. Like Zehrfeld and the man across the fence, they could square off against one another. Or they could respond collectively to the weeds' movement. If they followed the latter course, a hybrid geographic space—a kind of common ground—began to appear in the midst of their otherwise separate parcels of land.[7] In this shared space, what happened on one parcel affected adjacent parcels; one piece of property could not be detached materially from other properties, or one administrative unit from other units. Weeds that arose on one piece of land and then spread to adjacent and nearby areas instantly became the concern of a community of people. This was especially so when individual landowners, quite unlike Zehrfeld's neighbor, did their best to stop the plants. Because weeds often defied such efforts, landowners and government agencies could not deal with the plants simply as legal nuisances, as problems attributable to the negligence of single persons. Instead, farmers, community leaders, scientists, extension agents, and public officials began to address the problem cooperatively, in ways more consistent with weed ecology. They began to think about the landscape less in terms of its bounded and privatized parts than in light of the links that weeds drew between those parcels, and they began to take action based on this community-oriented premise. In effect, weeds and collective human responses to those plants momentarily turned areas of Montana into a kind of commons.

Interpreting the historical geography of western weeds as a problem of the commons requires some explanation. Conventionally, a commons refers to a resource that was limited to a particular group of people. Within the group, strict rules governed rights of access to the resource.[8] Many forms of common property, however, were also inherently spatial. In these cases, a commons was a problem of space, not just of social obligations or abstract rights. This spatiality, as geographers call it, is particularly important for understanding parts of nature that moved across boundaries.[9] Water, deer, and similar commons resources moved, and they moved in relation to the land or a habitat. This was the geographic basis of what can be called an *ecological commons*: a mobile nature that in moving across boundaries complicated the fundamental order of the grid by joining fragmented parcels—even privately owned parcels—into a larger whole. But this concept can be refined further, and can be extended to interpret forms of mobile nature, such as weeds, that posed problems to people. In a *weed commons*,

[7] Gillian Rose, "Hybridity," in *Dictionary of Human Geography*, ed. Johnston et al., 364 and Edward W. Soja, *Thirdspace: Journeys to Los Angeles and Other Real-and-Imagined Places* (Cambridge, MA, 1996), 1–23.

[8] Bonnie J. McCay and James M. Acheson, "Human Ecology of the Commons," in *The Question of the Commons: The Culture and Ecology of Communal Resources*, ed. Bonnie J. McCay and James M. Acheson (Tucson, 1987), 1–34 and Louis S. Warren, *The Hunter's Game: Poachers and Conservationists in Twentieth-Century America* (New Haven, 1997), 1–20, 183 (notes 8, 9).

[9] Derek Gregory, "Spatiality," in *Dictionary of Human Geography*, ed. Johnston et al., 780–2.

people took collective action against troublesome plants, such as tumbleweeds, that swept across and threatened their individual properties. In terms of rights, what was important was the right to proscribe or prohibit certain practices that enabled the plants to spread, and, if necessary, the right to take extraordinary measures to stop that movement. Whether informally or officially sanctioned, these common rights did not completely displace private property rights, rather, common and private overlapped.

Unrestrained sod-busting, economic depression, and increasing weed density during the first four decades of the twentieth century alerted Montana citizens to the common nature of their weed problem and provoked them to take collective action against it. In 1939, their efforts culminated in state legislation that authorized the formation of local weed districts with the power to impose taxes and regulate land use for the purpose of eliminating weeds. Along with other state and federal land-use policies in the New Deal era, the weed district law demonstrated the importance of community and cooperation in the aftermath of economic and environmental calamities that weakened individualism and checked the zealous pursuit of private property. Examining Montana's experience with the weed commons and the weed district thus helps to illuminate a private-to-public shift in the management of western American land, although that shift, as Hugo Zehrfeld's situation showed and as we will see, was never as complete as its proponents desired.[10]

A brief overview of weeds and their spread provides essential context for understanding the formation of Montana's weed commons. That understanding, however, must be grounded in an awareness that the very elusiveness of weeds—their tendency to slip through the grid—has obscured their history. Weeds defied the grid's purpose, which was, as anthropologist James Scott has observed, to make nature "legible," or comprehensible, to settlers so they could possess and manipulate it for productive purposes.[11] Not only the rectangular survey and its maps but also government-sponsored scientific investigations helped settlers understand the land and reap profits from it. In *Weeds of Montana* (1901), for example, an early survey of the state's weed flora, the Montana botanist J. W. Blankinship catalogued some one hundred species.[12] And yet the grid and the scientific survey were imperfect aids for tracking and controlling weeds. To an extent, weeds remained illegible, even invisible; scientists then, and since, have not known precisely how they migrated, the exact dates at which they appeared in a particular place, or their ultimate geographical distribution. Someone like Blankinship (or later, an historian) might fix a date on a weed's presence in Montana, but that

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[10] William G. Robbins and James C. Foster, eds., *Land in the American West: Private Claims and the Common Good* (Seattle, 2000), summarizes the debate. See also, Donald Pisani, *Water, Land, and Law in the West: The Limits of Public Policy, 1850–1920* (Lawrence, 1996).

[11] Scott, *Seeing Like a State*, 11–52. Term quoted above can be found throughout Scott's book.

[12] J.W. Blankinship, *Weeds of Montana*, Montana Agricultural Experiment Station Bulletin 30 (Bozeman, 1901).

date only identified when a person noticed the plant, not when it arrived. That date, furthermore, did not reflect the time and place of unrecorded observations, and it only partially described the weed's geographic extent and density. Weeds always remained something of a mystery.

Despite their elusiveness, weeds did have a discernible history, and their expanding presence in the Montana landscape, in general outline, can be narrated. Weeds spread along transportation routes, in association with agricultural activities, in connection to motor vehicles, and in conjunction with the state's boom-bust economy and environmental disruptions. Their paths led to embattled fields and angry neighbors, and also to the common spaces that people such as Hugo Zehrfeld perhaps desired, but would never know.

Weeds accompanied Europeans in their expansion around the globe, but these were not the first such plants in western American places like Montana.[13] The Hidatsa Indians, expert agriculturalists along the upper Missouri River, had to contend with them. Beginning in 1906 and for almost a decade thereafter, Buffalo Bird Woman told the anthropologist Gilbert Wilson stories about Hidatsa farming, how the women laid out gardens, made tools, raised corn, beans, and squash, preserved the harvest, and prepared food. She also told him something about weeds. "In olden times we Indian women let no weeds grow in our gardens," she said. "I was very particular about keeping my own garden clean all the time." She did not identify these plants beyond just calling them weeds, but her account shows how Native peoples' cultivation of crops instantly created a category of unwanted plants.[14]

Buffalo Bird Woman, though, recognized that the weed problem worsened when European American farmers arrived. "Now that white men have come and put manure on their fields," she said, "these strange weeds brought by them have become common. . . . I think [it] is harder to [keep our gardens clean] now that we have so many more kinds of weeds."[15] When she uttered these words, the high plains were already undergoing a biological revolution that replaced vast acreages of older biota with new cultivars like wheat, but also with new weeds like Russian thistle. Buffalo Bird Woman pointed to only one means, livestock and their excrement, by which the new unwanted flora spread.

A primary route along which weeds traveled was the railroad network that connected Montana to the wider world. Between 1881 and 1909, five railroads laid track into or across the state.[16] These lines, their many branches, and the trains that rolled along them provided an avenue of weed expansion, and railroad right-of-ways

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[13] Alfred Crosby, *Ecological Imperialism: The Biological Expansion of Europe, 900–1900* (New York, 1986), 145–70.

[14] As told to Gilbert L. Wilson, *Buffalo Bird Woman's Garden: Agriculture of the Hidatsa Indians*, with a new introduction by Jeffery R. Hanson (St. Paul, 1987), 116. Originally published as *Agriculture of the Hidatsa Indians: An Indian Interpretation* (St. Paul, 1917).

[15] Wilson, *Buffalo Bird Woman's Garden*, 117.

[16] Michael P. Malone and Richard B. Roeder, *Montana: A History of Two Centuries* (Seattle, 1976), 129–40.

became known for being among the first places that new weeds appeared. When work crews built and maintained the railroad beds, they disturbed the soil and opened it to weed seeds that traveled on the cars, often in livestock bedding, hay, and other commodities. When workmen swept out the cattle cars or moved cargo, or simply as a train passed by, weed seeds fell to earth and sprouted. At least one weed, tumbling mustard, actually clung to passing trains and scattered its progeny for miles. Because of its association with trains, farmers called it Jim Hill mustard, after James J. Hill, the founder of the Great Northern.[17]

More than railroads, the advance of modern agriculture spread weeds. In the early twentieth century, a combination of technological innovations, government policies, beckoning markets, abundant land, and a moister climate stimulated a vast expansion of Montana agriculture. Irrigation projects opened in the drainages of the Columbia, Missouri, and Yellowstone rivers. The 1909 Enlarged Homestead Act, which allowed each settler to claim 320 acres (one-half of a square mile section), and the wet years of 1906–1917 encouraged a boom in grain farming on the prairies of eastern and north-central Montana. All told, the number of Montana farms rose from around 13,000 in 1900 to about 57,000 in 1920; during the same period, the amount of cultivated land soared from roughly 1.7 million to some 11 million acres.[18] This final extension of the Great Land Rush opened the soil not only to crops but to weeds. The seeds of these plants came by railroad, in the fur and guts of livestock, attached to implements, and in crop seed stocks. Some weeds closely resembled crops, and this biological mimicry enabled their spread. When farmers threshed an oat crop, for example, they often harvested wild oat seeds with it. Other species multiplied not only by seeds, but by roots. Canada thistle, which produced beautiful purple flowers and abundant seeds, also generated a long, tough, creeping rootstalk. A plow slicing through sticky soil might pick up pieces of the root and carry them to other fields, where they would sprout. Still other weeds dispersed through the one substance that farmers in dry areas valued most: irrigation water. Dodder (also known as strangle weed and love vine), a pale yellow, sinuous parasite, spread its seeds through irrigation systems and clung to alfalfa, sapping its vitality.[19] And, there were many more, all of them infiltrating fields, crowding out crops, reducing yields, and cutting into profits.

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[17] Blankinship, *Weeds of Montana*, 8 and D.B. Swingle, H.E. Morris, and E.W. Jahnke, *Fifty Important Weeds of Montana*, Montana Extension Service Bulletin 45 (Bozeman, 1920), 7, 67–9.

[18] L.P. Reitz, *Crop Regions in Montana as Related to Environmental Factors*, Montana Agricultural Experiment Station Bulletin 340 (Bozeman, 1937), 15–9; Neil W. Johnson and M.H. Saunderson, *Physical Factors Affecting Montana Agriculture*, pt. 1 of *Types of Farming in Montana*, Montana Agricultural Experiment Station Bulletin 328 (Bozeman, 1936), 30–2; Paul W. Gates, "Homesteading in the High Plains," *Agricultural History* 51 (January 1977): 119–27; K. Ross Toole, *Twentieth-Century Montana: A State of Extremes* (Norman, 1972), 25–69. This summary is not intended to suggest that Montana was environmentally homogeneous; see Reitz, *Crop Regions in Montana*.

[19] Blankinship, *Weeds of Montana*, 3–17, 28–30, 35 and Swingle, Morris, and Jahnke, *Fifty Important Weeds of Montana*, 3–9, 18–22, 39–40.

But it was not simply the Great Land Rush that spread weeds. Farm failure—the aftermath of the rush—also created conditions that encouraged unwanted plants. Russian thistle perhaps best illustrated this. As near as botanists could tell, the species had come to southeastern South Dakota in 1873 or 1874, its germ buried in a batch of flax seed from Russia. Open farm land enabled its expansion. At first, Russian thistles headed north, along railroads and following the trend of the topography, roughly in an area confined by the Missouri River on the west and the James River on the east. Lyster Dewey, a U. S. Department of Agriculture botanist, roamed the plains in an effort to map the plants' distribution. Dewey's report, published in 1894, located Russian thistles in North Dakota, but by then the plants almost certainly had eluded him and traveled west into Montana, probably along the Northern Pacific Railroad.[20] Then, in the late 1910s and early 1920s, a momentous event occurred that caused Montana's thistle population to irrupt: drought and depression suddenly ended the era of ample rainfall, high yields, and great profits. People left the land in droves; by 1930 some 10,000 farms had disappeared, and despite the increasing average size of the remaining operations, abandonment and crop failure left millions of acres idle and bare, an open niche for opportunistic plants.[21] The agricultural economist M. L. Wilson observed the transformation in the Triangle, a grain-growing region in the north central part of the state. "So the real test of farming began to be seen in 1917," he wrote. "In this year the Russian thistle found its own ideal conditions, and became a serious pest."[22] Precipitation increased in the late 1920s, but in the 1930s drought returned, and the exodus off the land intensified. By 1940, about 6,000 more farms had gone. Russian thistles continued to advance, and in 1936 a team of agricultural economists identified weeds as one of the "biological forces" shaping Montana agriculture.[23] The following year, Hugo Zehrfeld learned exactly what the experts meant.

Long after agriculture adjusted, the rains returned, and the crops came back, weeds continued to spread through the state. Moments of prosperity led to more development and land disturbance. Periods of failure caused still more land abandonment and contributed to the introduction of new land uses. Through it all, new technologies opened still more routes for weed dispersal.

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[20] Lyster Hoxie Dewey, *The Russian Thistle: Its History as a Weed in the United States, with an Account of the Means Available for Its Eradication*, U.S. Department of Agriculture, Division of Botany, Bulletin 15 (Washington, DC, 1894), 7–18, appended maps; Blankinship, *Weeds of Montana*, 8, 20, 22–3, 53–6; Swingle, Morris, and Jahnke, *Fifty Important Weeds of Montana*, 85–7.

[21] Johnson and Saunderson, *Types of Farming in Montana*, 30–9; Gates, "Homesteading in the High Plains," 127; Toole, *Twentieth-Century Montana*, 70–98.

[22] M.L. Wilson, *Dry Farming in the North Central Montana "Triangle,"* Montana Extension Service Bulletin 66 (Bozeman, 1923), 5–25 (quote on 17), 82–5.

[23] Gates, "Homesteading in the High Plains," 127 and Johnson and Saunderson, *Types of Farming in Montana*, 39.

A primary example of a new technology was the automobile. In 1931, the geographer Isaiah Bowman observed that "the dry western grass country" of Montana was "built on gasoline." Bowman did not associate the "gasoline culture" of the Great Plains with the spread of weeds, but they were connected. Cars, trucks, tractors, and farm equipment provided an outstanding vehicle for weed seeds, and the machines came with an expanding network of roads that served as corridors and jumping-off places for the weed advance into the Big Sky state. Beginning in the Second World War, for example, the owners of custom combining outfits—trucks, trailers, and combines—drove north from Oklahoma, following the seasonal northerly advance of the wheat harvest. Moving from field to field, the vehicles picked up so many weed seeds that by the time they reached the heart of Montana's grain districts they were veritable rolling collections of weed life. In the fall of 1958, the Chouteau County extension agent counted eleven kinds of weed seeds on a single combine.[24]

One plant that spread with alarming vigor in conjunction with automobiles was spotted knapweed, a hardy Eurasian species with a tough, sinewy stalk and purple or pink blossoms that looked like cornflowers. Discovered in Ravalli County in the early twentieth century—exactly when is unclear—it was prolific and aggressive: each plant produced thousands of seeds, and each plant emitted toxins that inhibited the growth of surrounding vegetation. Human actions assisted these natural advantages. Hay, crop seeds (knapweed evidently arriving in a batch of alfalfa seed), and irrigation water carried the plant's offspring. Logging, farming, grazing, railroads, and construction disturbed soil and opened space in which those seeds could grow. But more than anything else, automobiles and roads transformed knapweed into one of the most notorious Montana plants. On weedy prairies, fields, and roads, cars and trucks snagged seeds; wind, water, vegetation, or vibration later dislodged the tiny grains. By the late twentieth century, Montana contained nearly 12,000 miles of highways and some 66,000 miles of smaller roads, "a web of corridors" along which knapweed and other unwanted vegetation moved. By such means did knapweed expand to some 4.5 million Montana acres by the 1990s. In Missoula and Ravalli counties it grew so thickly and over such a large area that concerned citizens thought it an environmental disaster.[25]

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[24] Isaiah Bowman, "Jordan Country," *Geographical Review* 21 (January 1931): 48; Thomas D. Isern, *Custom Combining on the Great Plains: A History* (Norman, 1981), 37, 182–3; Leland P. Cade to Albert H. Kruse, 10 November 1959 and Kruse to Cade, 18 November 1959, file 32, box 3, Record Series (hereafter, RS) 26, Montana Department of Agriculture Records (hereafter, MDAR), Montana Historical Society, Helena (hereafter, MHS).

[25] John R. Lacey and Peter K. Fay, eds., *Proceedings of the Knapweed Symposium*, Montana Agricultural Experiment Station Bulletin 1315 (Bozeman, 1984); Peter K. Fay and John R. Lacey, eds., *Proceedings of the 1989 Knapweed Symposium* (Bozeman, 1989); for quote see Montana Department of Agriculture (hereafter, MDA), *Noxious Weed Trust Fund Programmatic Environmental Impact Statement* (Helena, 1992), p. 2.16, Montana Historical Society Library (hereafter, MHSL), MHS.

As bad as it seemed, knapweed was only one among many unwanted plants that appeared to be overrunning Montana. Exactly how many acres contained weeds, the percentage of each acre those plants covered, and the monetary loss to farmers are difficult to assess. A weed atlas, completed in 1980, reveals a gradual expansion of weeds under the Big Sky. More recent data show that by the 1990s, weeds were present on millions of acres and cost Montanans from $100 million to $300 million annually. Although precision is impossible, it is certain that during the twentieth century, weeds steadily spread across the state at considerable hardship to agricultural producers.[26]

Of course, public officials and many landowners did not idly stand by. Beginning in the late nineteenth century, the Montana legislature passed a series of laws ordering landowners to eliminate weeds and requiring seed producers to maintain the purity of their stocks. Cultivation, mowing, smothering, crop rotation, and fire destroyed weeds. So did herbicides such as 2,4-D and imported insects, both introduced in the late 1940s. Montanans often spoke of their methods as a war.[27] But harsh tactics and violent rhetoric did not necessarily reduce weeds—in fact, some species continued to broaden their range. By the early twenty-first century, weeds remained a ubiquitous feature of the Montana landscape and a major challenge to land management and economic production.

A crucially important part of that challenge was the manner in which weeds disturbed the boundaries that, in theory, provided for an orderly division of the land. Elk wandered through knapweed on a ranch and then passed onto adjacent national forest. A plow carried gumbo soil and bits of bindweed roots from one field to another. Water conveyed curly dock from a stream into an irrigation canal and onto farms. A railroad train scattered thistle seeds along its right-of-way. A neighbor failed to plow his land, and poor Hugo Zehrfeld ended up with a harvest of tumbleweeds. By such means, weeds linked disparate parcels and reminded people that they could not divide the land absolutely and that what happened on one piece of ground could not be kept completely distinct from what occurred on another.

Repeated across the state, this process encouraged public officials, scientists, journalists, farmers, ranchers, and other property owners to begin talking about the landscape in terms more appropriate to its weedy ecology. They spoke of weeds as a "community problem" in which Montanans had a "common interest" and which

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[26] Frank Forcella and Stephen J. Harvey, *New and Exotic Weeds of Montana*, vol. 2, *Migration and Distribution of 100 Alien Weeds in Northwestern USA, 1881–1990* (Bozeman, 1980), Montana Plant Management Plan/Weeds file, box 8, acc. no. 87-027, ESR, MSU and Roger L. Sheley, Bret E. Olson, and Carla Hoopes, *What is So Dangerous about the Impacts of Noxious Weeds on the Ecology and Economy of Montana?* Montana Experiment Station Extension Bulletin 152 (Bozeman, 1998).

[27] For example, H.E. Morris and Ralph D. Mercer, *Perennial Weeds and their Control*, Montana Agricultural Extension Service Bulletin 225 (Bozeman, 1944) and Robert L. Warden, James L. Krall, and V.C. Hubbard, *Recommendations for Chemical Weed Control in Montana for 1949*, Montana Extension Service Bulletin 256 (Bozeman, 1949).

required their "cooperation" to solve. This discourse of community, commonality, and cooperation coincided with, and in certain respects was consistent with, the talk of a war on weeds. It also expressed a more complex view of nature and people than the war rhetoric implied.[28] The botanist J. W. Blankinship, for example, although he spoke of a war on weeds, also employed other figures of speech to make sense of the plants, and he wrote sensitively, even admiringly, of them. He understood their central paradox, that agricultural activity made weeds possible. He admitted that scientists knew little about them. Most important, Blankinship believed that people must work together—cooperate—to deal with weeds.[29] This language of community, commonality, and cooperation followed from the realization that the weedy landscape was more than the sum of its divisible parts. As weeds moved, and as people like Blankinship responded, the weed commons began to take shape.

A sign of this trend appeared as early as 1895, when Montana enacted its first weed law. This measure declared Canada thistle, Scotch bull thistle, and Russian thistle "common nuisances," required landowners to destroy them, and empowered county weed supervisors to enter private property and destroy the plants if the owner failed to do so. The key concept in the law was "nuisance," a condition that arose when one landowner engaged in an activity that interfered with another landowner's fundamental right to use his or her property. A "common nuisance," by extension, described a situation in which a landowner interfered with the rights of an entire group. As a Montana attorney general later explained, quoting Montana law, a common nuisance was a nuisance "which affect[ed] at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may [have been] unequal." Thus, under the 1895 weed law, a landowner who did not eliminate weeds posed a common nuisance to the neighbors, because those weeds cast seeds that crossed property boundaries, sprouted, and interfered with the activities of other people. In this case, "common" meant a shared condition. And as expressed by the attorney general, "community," "neighborhood," and "extent" implied not just abstract legal conditions, but physical circumstances that people shared in geographic space.[30]

Some Montanans came to believe that the 1895 law was inadequate and that society must respond cooperatively to weeds. In their view, "common" had social im-

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[28] Richard H. Schein, "The Place of Landscape: A Conceptual Framework for Interpreting an American Scene," *Annals of the Association of American Geographers* 87 (December 1997): 660–80, analyzes the multiple discourses that people use to interpret and order the same landscapes.

[29] Blankinship, *Weeds of Montana.*

[30] For first quote, see ibid., 23 and for second quote, see Robert L. Woodahl to George Lackman, 9 June 1976, in MDA, Noxious Weed Management Advisory Council (hereafter, NWMAC), "Final Report," 6 December 1976, appendix VII, MHSL, MHS. See also, H.G. Wood, *A Practical Treatise on the Law of Nuisances in their Various Forms; Including Remedies Therefor at Law and in Equity*, 2nd ed. (1875; reprint, Albany, 1883), 1–82.

plications that derived from the nature of weeds and that required people to do more than blame individual property holders for the plants. Nuisance law typically covered decrepit buildings, manure piles, smoke, noise, vicious dogs, and other conditions that people clearly caused and that they could rectify.[31] In one sense, it was reasonable that the Montana legislature would place weeds in this legal category—some people truly were negligent in allowing the plants on their properties. And yet weeds lived and moved in ways that made them different from other nuisances, and this fact rendered nuisance law alone insufficient. Although weeds thrived on human activity, people were not responsible for the plants in the same way they were responsible for rundown buildings, reeking dung heaps, factory effluents, drunken revelry, or snarling canines. A weed's genetic code unfolded in relationship to its environment, and humans only partially influenced that process. Weeds indeed occupied niches that people made, but the sheer vitality of the plants defied simultaneous human efforts to destroy them. Even a responsible landholder might not be able to stop their spread. Weeds, in sum, had a degree of biological agency that most nuisances did not. Because the plants moved independently (and stealthily) through the grid and its interstices—ditches, fence lines, railroad rights-of-way, roadsides, seed stocks, abandoned fields—some Montanans could not blame them on any one landholder. In their view, weeds posed a common problem that required the mutual effort of many citizens.

J. W. Blankinship advanced such a position. In *Weeds of Montana*, Blankinship contended that the law should enable entire Montana communities to organize against weeds. He likened weeds to another legal nuisance, contagious diseases. People should unite to extirpate weeds the same as they worked together to eliminate diseases, he said. His analogy was not completely apt, because humans exerted far more control over their microbe-carrying bodies than over their weed-infested fields. Regardless, the comparison provided the botanist with a means to express his central point: dealing with weeds required cooperative effort. The objective should be "the organization of farmers into districts designated by the valley or irrigation system and the appointment or election of a competent weed inspector for each district." The inspector, furthermore, should have the authority to require "a certain amount of aid from each farmer to be used in the common interest of stamping out these pests from infected localities." Blankinship's plan echoed scientist John Wesley Powell's earlier call for irrigation and pasturage districts—"commonwealths"—in which citizens would jointly manage land and water. Like Powell, Blankinship was no enemy of private property, but like Powell, he recognized that the people who inhabited a watershed or took water from the same irrigation system had a common interest in nature.[32]

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[31] Wood, *A Practical Treatise* and William J. Novak, *The People's Welfare: Law and Regulation in Nineteenth Century America* (Chapel Hill, 1996), 44–5, 60–71, 191–227.

[32] Blankinship, *Weeds of Montana*, 21–2 and William deBuys, ed., *Seeing Things Whole: The Essential John Wesley Powell* (Washington, DC, 2001), 15, 139–208, 235–42, 299–313.

Blankinship's proposal for weed districts was years ahead of its time, but it suggested the extent to which weeds encouraged some people to see the landscape whole. Montanans after him inched toward his point of view. In 1920, after the collapse of the state's homestead boom, a group of botanists asserted that it was "almost impossible for a man to keep his land free from certain weeds, such as dandelion and Russian thistle, unless there is concerted effort to the same end by all farmers in the immediate neighborhood." Those same scientists, however, proposed a new weed law that deliberately avoided the most widely-dispersed species. Forcing landholders to destroy Russian thistles and other omnipresent plant pests, they said, was so costly that it weakened public support for compulsory eradication. Better to begin conservatively, focusing on a few especially tenacious perennial weeds. The following year, the legislature responded to the botanists with a new statute that identified only Canada thistle and quack grass as "noxious weeds." Yet even as the legislators narrowed the law botanically, they broadened it geographically. Not only did the measure expand public authority over private space, but it extended the individual landholder's responsibility into public areas. It declared landholders liable for noxious weeds on one-half of any adjoining road or highway, and it stated that in terms of those unwanted plants, the public right-of-way adjacent to private land "shall be considered part of such land."[33] The law thus blurred boundaries and merged private and public spaces in a single biological continuum. When Canada thistle or quack grass migrated from a private parcel onto a public right-of-way, and when the landholder followed them to the highway shoulder and there chopped them down, spatial conventions that clearly separated private and public realms all but disappeared. Rigid boundaries began to give way to a landscape that looked more like an ecologically fluid commons.

Montana lawmakers and landholders did not know that a precedent of sorts existed for the formal recognition of common weedy spaces in which private and public interests merged. Here it is instructive to return for a moment to the Hidatsa landscape, for even in the relatively unregimented world of Buffalo Bird Woman, weeds crossed boundaries and people had to adjust. Hidatsa gardeners with adjoining plots maintained a boundary zone, roughly four feet wide, between them. This *maądupätska'* was an area of complex social and ecological negotiations, a kind of mini-commons or right-of-way. A gardener might grow squash, beans, or sunflowers in this space, but first she had to gain the consent of her neighbor. More to the point, like the 1921 law that required property holders to attend to weeds in the road, each gardener was responsible for clearing weeds from the *maadupätska'*. "Each gardener hoed her half of the *maadupätska'* to keep it clean of grass and weeds," Buffalo Bird Woman recollected. "We were particular about this; we did not want to have any weeds in our gardens."[34] Hidatsa gardeners and European American farmers occupied different landscapes, of

[33] Swingle, Morris, and Jahnke, *Fifty Important Weeds of Montana*, 14 and *Laws of Montana, Seventeenth Session* (Helena, 1921), Chapter 168, p. 319.

[34] Wilson, *Buffalo Bird Woman's Garden*, 113.

course, but their attitudes toward weeds and their spatial solutions to weed problems bore some resemblance. In each culture, the movement of unwanted plants across socially-structured and bounded space generated a weed commons and rules for regulating it.

For Montanans, those rules gradually became more complex and stringent, and over the years continued to expand public regulation of private space, further blurring the rigid boundaries that structured the grid. As farmers sank into the post-World War I era of drought, depression, and misery, the weed law became more exacting. "When weeds are so intermixed with a growing crop that the field is a menace to the community," stated a 1923 amendment to the law, "the [county] weed commissioner shall have power to order the destruction" of part or all of the crop itself.[35] It was an extreme measure, but perhaps one that reflected the straitened economic and environmental circumstances of the people who produced it.

The law provided an official basis for public campaigns against weeds, but at the same time people also came together informally to deal with the problem. Authorities sometimes assisted them, but the primary inspiration of these informal groups was voluntary cooperation, not official coercion. In 1923, Ravalli County hired a commissioner whose duties included distributing information about weeds and demonstrating control methods. According to county agent Charles Carney, the public responded enthusiastically to the commissioner's educational programs. Most important, people began to pressure recalcitrant and negligent neighbors to fight weeds. "Public opinion has been aroused so that the man who allows Canada thistles to go to seed on his place . . . has been subject to very severe criticism," Carney reported. "As a consequence it was not necessary for the weed commissioner to do as much enforcement work as otherwise would have been necessary."[36]

Thus, by the 1920s, Montanans had voiced ideas, passed laws, and instituted practices that addressed the manner in which weeds passed through the grid and began to define common ecological spaces. One major event, however, gave the inhabitants of the state an opportunity for their most complete realization of this cooperative approach to land: the Great Depression of the 1930s. The Depression's economic and ecological problems weakened popular faith in the individualistic values and land-use methods that had driven the settlement of the West. People found alternatives in social arrangements and land-use practices that emphasized the greater public good. The grid and its divisions remained in place, but a moment had arrived when significant numbers of people looked at the landscape and saw relationships, some of them traced by the movement of unwanted organisms.

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[35] *Laws of Montana, Eighteenth Session* (Helena, 1923), Chapter 60, p. 133.

[36] Charles E. Carney, "Ravalli County, Cooperative Extension Service, Report from December 1, 1922 to March 23, 1923," pp. 14, 19, Ravalli files, box 60, acc. no. 00021, ESR, MSU.

The shift in emphasis from the individual to the collective appeared throughout society. Influential public officials believed that the West's settlement practices had failed. The Great Plains Committee, created by President Franklin Roosevelt to study the problems of the region, criticized cherished frontier principles "[t]hat what is good for the individual is good for everybody," "that an owner may do with his property what he likes," "[t]hat free competition coordinates industry and agriculture." The committee's report quoted the ecologist Aldo Leopold: "Civilization . . . is not the enslavement of a stable and constant earth. It is a state of *mutual interdependent cooperation* between human animals, other animals, plants, and the soils, which may be disrupted at any moment by the failure of any one of them." Among ordinary Americans, as Robert McElvaine has noted, "there was during the Depression an expansion of the more traditional, community-oriented values that have generally been in decline throughout the rest of the twentieth century." This was the case among people at the Montana grass roots, Hugo Zehrfeld's neighbor (and others like him) excepted. The high plains farmer Charles Vindex recalled that the Depression's many woes inspired greater self-reliance in his family, but he also remembered an important shift "in the whole community's approach to common problems." Neighbors combined their labor to secure a water supply, pooled resources to excavate coal, and allowed the free use of vacant land.[37]

In Montana, the cooperative trend yielded not only informal collaboration among farmers, but also changes in land use policies. Acts of Congress in 1928 and 1934 authorized the formation of grazing districts in which ranchers and federal officials jointly managed public rangelands. In 1933, the Montana legislature enabled ranchers to form grazing districts on private land. This arrangement, an agricultural economist and a state official observed, allowed a group of livestock operators to purchase or lease property and manage it "as a grazing common."[38] The legislature refined the measure in 1935 and 1939, and by 1940, Montana had forty such districts. The state deepened its commitment to cooperative land management in 1937 and 1939 with the passage of measures that permitted landholders to organize soil conservation districts in which they could enforce land-use regulations. By 1942, Montanans had formed ten districts. Shortly thereafter, two social scientists described grazing and soil districts as forms of "collective tenure," part of a "general drift in the direction . . . of collective and group

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[37] Report of the Great Plains Committee, *The Future of the Great Plains* (Washington, DC, 1936), 64, 65, 65, 63. (The first three of these quotes were column headings and were capped in the original.) See also, Robert S. McElvaine, *The Great Depression: America, 1929–1941* (New York, 1993), xxiv and Charles Vindex, "Survival on the High Plains, 1929–1934," *Montana The Magazine of Western History* 28 (October 1978): 2–10 (quote on 10).

[38] Paul W. Gates, *History of Public Land Law Development* (Washington, DC, 1968), 608–10 and for quote, see M.H. Saunderson and N.W. Monte, *Grazing Districts in Montana: Their Purpose and Organization Procedure*, Montana Agricultural Experiment Station Bulletin 326 (Bozeman, 1936), 3.

action throughout the economy," an expression "of the increasing emphasis on social rather than individual responsibility" in land management.[39]

The movement toward collective tenure included one other major piece of legislation: the 1939 weed act, which authorized Montana landowners to create the kind of weed districts that J. W. Blankinship had envisioned nearly forty years before. The political momentum that culminated in the measure began in 1935, when the legislature created the Montana State Planning Board and ordered it to draw up "a comprehensive plan for the physical development of the State." To formulate the plan, the board organized planning committees at the county level. By the end of the year, committees in 47 of 56 counties were at work.[40] In 1938, the Noxious Weed Committee of the Yellowstone County Agricultural Planning Board drafted a bill that became the most powerful weed statute in Montana history. Enacted the following year, the law provided for a vastly expanded community involvement in weed control, including on private land. The statute reaffirmed that weeds constituted a common nuisance and that landowners who failed to destroy such plants should suffer a fine. It authorized not only the state but each county to impose quarantines against the importation of farm products containing weeds or their seeds. Most important were the provisions for creating weed districts. Weeds moved through the grid, and so the law allowed citizens to undertake collective action within the transboundary spaces that those mobile organisms defined. Petitioners in a locality could draw a new kind of boundary—in effect, a biological boundary—around land on which grew plants they deemed to be a problem. Within this common space, landowners and land managers had to destroy the offending vegetation, and they could use public funds and equipment to do the work. If necessary, public officials could "take possession and control of any infested tract of land" in the district in order to destroy weeds. And in recognition of the fact that all people depended on the condition of the land, the law allowed districts to use tax revenues assessed on the entire county, even on those people who did not own land in a weed district and even on those anywhere in the county who owned little or no land at all.[41]

Montana's 1939 weed control act was a landmark piece of environmental legislation, the foundation of all subsequent weed statutes in the state. Modifications to the law merely extended its basic tenets. A 1941 amendment, for example, stipulated that

[39] G.H. Craig and Charles W. Loomer, *Collective Tenure on Grazing Land in Montana*, Montana Agricultural Experiment Station Bulletin 406 (Bozeman, 1943), 3–28 (all quotes on 8) and Layton S. Thompson, *Montana Cooperative State Grazing Districts in Action*, Montana Agricultural Experiment Station Bulletin 481 (Bozeman, 1951).

[40] Mary W.M. Hargreaves, "Land-Use Planning in Response to Drought: The Experience of the Thirties," *Agricultural History* 50 (October 1976): 565–76 (quote on 567).

[41] *Laws of Montana, Twenty-Sixth Session* (Helena, 1939), Chapter 195, pp. 490–7. See the extension agent annual reports for Yellowstone County for the years 1938 (pp. 28, 31–2, 99–103) and 1939 (pp. 28–31, 106–10), authored respectively by Keith Sime and Keith Sime and Jack Maguire, both of which are in Yellowstone files, box 81, acc. no. 00021, ESR, MSU.

when district supervisors destroyed weeds on private land, the county must assess the cost of the work not only on the negligent property owner, but also on those people who owned contiguous lands. The amendment justified this requirement based on the premise that "all work done upon any of the land of any one landowner shall be for the benefit of all of the land within the district."[42]

Following the 1939 act, Montanans organized against their problem plants. Yellowstone County led the way. Morning glory, knapweed, white top, and Canada thistle had severely reduced or stopped production on some 10,000 irrigated acres. Farmers, small businesses, corporations, and public officials already had begun to discuss the possibility of collective action, and the new weed act gave them a process for doing so. On 5 August 1939, farmers on the Anita Bench created a 2,124 acre district, the first in Montana; by 1942, landholders had put into place seven more districts, for a total of some 107,000 acres.[43] To an extent, the boundaries of the new districts followed the straight lines and right angles of the grid; tellingly, though, their boundaries often curved in conformity to ecological conditions—topography and the irregular geographical distribution of weed concentrations. [See Figure 1.] The pattern of weed district formation in Yellowstone County continued throughout Montana. By 1950, 28 of 56 counties had districts; soon after 1969, every county had them.[44]

The Montana weed law provided an official structure for communities of people to contend with weeds. But in some places, people continued to organize informally. In 1984, Carl Peterson, Ray Tocci, and Robert Jones, landowners around Three Forks, a town at the Missouri River headwaters, joined together to spray knapweed on their properties. The experience inspired the three to form a "volunteer weed brigade" to assist their neighbors. Using equipment borrowed from the Gallatin County Weed Board, they traveled from one parcel to another, offering to spray if the landowner paid for the herbicide. Reeves Petroff, in charge of the county's weed programs, complimented the brigade. "I would like to get more of these cooperatives together," he said. "The major problem is on private land, and trying to get private

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[42] *Laws of Montana, Twenty-Seventh Session* (Helena, 1941), Chapter 90, p. 150.

[43] See the extension agent annual reports for Yellowstone County for the years 1936 (pp. 17–8), 1937 (pp. 21–5), 1938 (pp. 31–2), 1939 (pp. 28–31), 1940 (pp. 33–9), and 1942 (pp. 72–4, 78), authored respectively by R.B. McKee, Keith Sime, Keith Sime, Keith Sime and Jack Maguire, Keith Sime, and W.H. Jones, all of which are in Yellowstone files, box 81, acc. no. 00021, ESR, MSU.

[44] The following can be found at acc. no. 00021, ESR, MSU: Ben B. Hill, "Narrative Report of County Extension Agent, Rosebud County, 1947," p. 74, Rosebud files, box 65; W.W. Mauritson, "Annual Report of Flathead County Agricultural Agents, 1948," 80, Flathead files, box 38; no author, "Annual Report of County Extension Agent, Counties of Powell and Deer Lodge, 1953," p. 32, Powell and Deer Lodge files, box 33; Robert L. Warden, "Annual Report of Weed Control Project, 1950," p. 2, 1950 file, box 14. See also Jones, "Annual Report of County Extension Agent, County of Yellowstone, 1942," 71 and *Laws of Montana, Forty-First Session* (Helena, 1969), Chapter 185, p. 462.

landowners to do something. They're more likely to listen to their neighbors" than to a government official.[45]

Such examples of rural mutualism combined with the increasing number of weed districts perhaps demonstrated a growing awareness of the weed problem and a willingness to address it cooperatively. By the late twentieth century, it might have seemed that Montanans had recognized fully the common nature of their weedy landscape. Unfortunately for the advocates of the weed law and collective responsibility, the complete realization of community action against weeds was not to be. Across the twentieth century, as alarmed officials and citizens proclaimed weeds to be a community problem requiring cooperative effort, numerous social, cultural, economic, political, legal, and environmental obstacles appeared. Most important, the grid—and the particular human interests that its many boundaries demarcated—remained powerful and could block weed control advocates from pursuing unwanted plants across the landscape. The common nature of weeds could not be denied, but neither could it displace fully the many divisions inscribed on the land. Consequently, the weed commons was always a qualified, contested, and contingent space.

Social circumstances and ideological obstacles deterred officials from stepping across property lines and enforcing the law. Some weed control officers wanted to avoid the criticism that their heavy-handed actions might evoke. "It seems difficult to get local officers to enforce the laws in their communities," wrote one extension service agronomist in 1922, "because they fear that they will become unpopular." Much as the social ties that unified small farming communities could encourage weed control, so could those same connections discourage aggressive regulation. Farmers with a libertarian streak, furthermore, simply did not like to be told what to do, and they might ignore efforts to get them to comply with the law.[46]

Economic and environmental problems prevented weed control in some areas. Farmers and ranchers on dry, infertile, or topographically rough land of low productivity and market value could not afford weed control, individually or collectively. Even after the passage of the 1939 weed act, poverty, in combination with land-use problems, prevented Hugo Zehrfeld and other landholders in Rosebud County from organizing. One group of sugar beet farmers, for example, could not take land out of production to kill bindweed because this would reduce the profit that they needed to pay for irrigation water and other expenses. Because of such economic and environmental

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[45] For quote, see Gail Schontzler, "Volunteer Brigade Fights Noxious Weeds," *Bozeman (MT) Chronicle*, 5 August 1984, Weeds vertical file (hereafter, WVF), MSU. For other examples, see county agent annual reports in box 54, acc. no. 00021, ESR, MSU, and newspaper clippings in WVF, MSU.

[46] The following are in ESR, MSU: V.D. Gilman to C.B. Ahlson, 24 October 1922, Weed Laws file, box 4, acc. no. 72043 (see for quote); Harold L. Dusenberry and Robert L. Warden, "Annual Report, Weed Control—Montana, 1948," p. 7, 1948 file, box 14, acc. no. 00021; Eugene Heikes, "Annual Report, Weed Control Project, 1957," p. 75, 1957 file, box 5, acc. no. 71031.

predicaments, Rosebud County did not establish a weed district until 1945, and even in its first year the organization accomplished little.[47]

Landowners outside weed districts rejected the assumption that their lands benefitted from activities inside those areas. They argued that their taxes gained them nothing, that their money only paid for the negligence of others. As extension service scientist Eugene Heikes reported, "People outside the district boundaries sometimes complain that they are taxed without representation. They sometimes complain that they are taxed and do not receive service." Differences in land use and spatial relationships often underlay this conflict. Irrigation farmers, densely settled, tightly organized in canal companies and irrigation districts, and afflicted with the same kinds of plant pests, established weed districts that reflected a shared geography and a clear commonality of interest. But their district boundaries left out dryland farmers and ranchers, who objected to paying taxes for weed control on irrigated land. In the late 1940s and early 1950s, for example, ranchers in northern Golden Valley County opposed taxes that raised revenue for the destruction of a "relatively small area of white top" in the county's southern end.[48]

Divisions between Indian land and European American land thwarted the formation of weed districts. In 1951, Extension Service agronomist Robert Warden stated that an irrigation district on the Blackfeet Indian reservation west of Cut Bank had "a very serious Canada thistle problem," but the district "contains several types of Indian owned land as well as White owned land, and as a result attempts to organize [a weed district] have not been successful." A fundamental administrative division between reservation land on one side and state, county, or private land on the other reinforced this problem. Weed districts could not encompass Indian reservations because the federal government, which held much of the land in trust, was exempt from taxation.[49]

The boundary that distinguished national forest land similarly posed problems for cooperative weed control. If weed districts by law could not extend their operations

[47] Dusenberry and Warden, "Annual Report, Weed Control—Montana, 1948," 6–7 and Eugene Heikes, "Annual Report, Weed Control Project, 1956," pp. 2, 25, 1956 file, box 5, acc. no. 71031, ESR, MSU. See the extension agent reports for Rosebud County for the years, 1940 (p. 14), 1941 (p. 17), and 1945 (pp. 79–80), authored respectively by Frank Barnum, H.L. Dusenberry, and H.L. Dusenberry, all of which are in Rosebud files, box 65, acc. no. 00021, ESR, MSU.

[48] For first quote, see Eugene Heikes, "County Weed Programs in Montana," 21 January 1960 in Heikes, "Annual Report, Weed Control Project, 1960," pp. 59–62, 1960 file, box 5, acc. no. 71031, ESR, MSU and for second quote, see Robert L. Warden, "Annual Report of Weed Control Project, 1951," p. 10, 1951 file, box 14, acc. no. 00021, ESR, MSU.

[49] The following are in acc. no. 00021, ESR, MSU: extension agent annual reports for Big Horn County for the years 1948 (p. 15) and 1949 (p. 24), both authored by N.A. Jacobsen and located in 1948 and 1949 files, box 21 and, for quote, see Robert L. Warden, "Annual Report of Weed Control Project, 1951," p. 7, 1951 file, box 14. See also R.V. Bottomly, *Report of the Attorney General of the State of Montana, January 1, 1947 to December 30, 1948* (Helena, 1948), 79–82.

onto Indian reservations, neither could they tax and regulate national forests. And while U. S. Forest Service officials might support weed control, coordinating their efforts with county-level activities was difficult because the National Environmental Policy Act (1970) and other federal regulations required time-consuming environmental impact statements and extraordinary care in herbicide use. Meanwhile, people outside the forests expressed frustration. In 1980, in a telling use of spatial metaphor, Sweet Grass County officials depicted national forests as obstacles that hindered weed fighters from pursuing the plants across the landscape. "Public lands are a stumbling block in noxious weed control," they complained. "Paperwork and red tape are slowing weed control efforts to a crawl while weeds are propagating at an astounding rate. Weeds don't wait!"[50]

Such jurisdictional problems pointed to a major underlying problem of weed control and even weed districts themselves: no matter how much the people who work in weed control and those who manage weed districts attempted to follow the movement of weeds, no matter how much they acknowledged the existence of a common weed space, they ultimately remained imprisoned in the grid. After surveying Montana's weed problem in the mid-1970s, the botanist David Armstrong offered a concise summation of the problem: "Many districts go to property or fence lines and stop. They don't accomplish anything." In 1982, Walt Mangels, a farmer in the Flathead Valley, concurred: "You can control weeds in one area," he said, "but if you've got them right across the fence, you'll never get rid of them." The same problem stymied efforts to stop weeds on county, state, provincial, and national levels. Mobile nature overran boundaries, but people could not just knock down the fences in pursuit.[51]

Nor were boundaries and fences the only spatial obstacles. Even within the grid, even inside all of those straight edges and right angles, weeds proved maddeningly elusive. Simply mapping their presence to any appreciable degree of accuracy posed enormous problems. How many Montana acres, exactly, contained weeds? What percentage of each acre did they occupy? Where were those acres? In such a vast state with so many remote corners, was it even possible to locate all concentrations? David Armstrong identified the lack of accurate and thorough maps as another obstacle to weed district work. But even as the technical precision of mapping improved, scien-

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[50] Davis W. Armstrong III, "1976 Consolidated Report of County Noxious Weed Programs," 3, MHSL, MHS and T.J. Gilles, "Spreading Weeds Likened to a Biological Forest Fire," *Great Falls (MT) Tribune*, 21 August 1984. The following are in file 14, box 25, B10:1-1, Director's Office Records, Montana Department of Agriculture Records (hereafter, DOR, MDAR), MHS: Roger Engle et al., "To Whom it May Concern," ca. 1986 (see for quote); Ted Schwinden to Tom Brownlee, n.d.; Celestine Lacey to Keith Kelly, 1 July 1986; Jim Story to Keith Kelly, 22 August 1986. The same kind of tensions afflicted citizen relations with other public land agencies and, in addition, railroads.

[51] For first quote, see Tribune Capitol Bureau, "'Wrong Targets' Hit in Counties' Weed War," *Great Falls Tribune*, 11 May 1977, and for second quote, see Mea Andrews, "Fighting a Noxious Weed Problem," *Missoula (MT) Missoulian*, 12 September 1982, both WVF, MSU.

tists still had difficulty getting an exact fix on their quarry. Meanwhile, the weeds kept moving.[52]

As the plants spread, yet another formidable obstruction appeared when Montanans began to oppose the use of 2,4-D. By the 1960s, citizens and environmental organizations, informed by a growing popular awareness of ecology, decried the harm that herbicides and pesticides could cause. In 1968, the Montana Wildlife Federation (MWF) lashed out at weed control advocates over a proposed revision of the state weed law that would require all counties to set up weed control programs. "These people," complained an MWF representative, "seem to be talking about a spray everything program which ultimately will produce a utopia without weeds." The MWF and other critics charged that heavy-handed spraying along roadsides not only destroyed unwanted plants, but also wiped out wildlife habitat. They pointed to cases in which overzealous application on windy days caused 2,4-D to drift onto fields where it damaged crops. And implicit in their claims were fears about the effect of the chemical on human health.[53]

Managers of state game refuges shared this hostility to 2,4-D. Fish and Game officials approved of mechanical and biological methods, but they opposed the use of the herbicide because they doubted its effectiveness and because of the threat that it posed to wildlife. A draft response to weed district officials, circulated within the Montana Fish and Game Department in 1972, voiced their opposition: "Obviously your [spray] program isn't worth a great deal. . . . We are not interested in [it]. Please do not bother us with this worthless program in the future."[54]

Objections to the use of 2,4-D ultimately posed the strongest spatial challenge to the weed law and the weed control district. The herbicide opponents asserted the primacy of an ecological system whose scale far exceeded the relatively narrow public space that weeds defined. All life was linked, they suggested, and society had an ethical responsibility to prevent toxics from moving through the land and harming or

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[52] Armstrong, "1976 Consolidated Report of County Noxious Weed Programs," 4 and Carol Flaherty, "Mapping out the Problem is an Ongoing Project," in *The War on Weeds*, ed. Montana Extension Service (Bozeman, 2000), 8.

[53] The following are in WVF, MSU: Kay Hardin, "Weed, Wildlife Groups Disagree on Proposed Law," *Billings (MT) Gazette*, 12 November 1968 (see for quote); Tribune Capitol Bureau, "Statewide Weed Control Given Early Approval," *Great Falls Tribune*, 31 January 1969; Tribune Capitol Bureau, "State Criticized for Expanding Use of Weed Killers," *Great Falls Tribune*, 16 November 1972. For drifting 2,4-D and consequences, see Warden, "Annual Report of Weed Control Project, 1950," 22; N.A. Jacobsen, "Annual Report, Cooperative Extension Work, Big Horn County, Montana, 1950," p. 15, Big Horn files, box 21, acc. no. 00021, ESR, MSU; W.F. Woolston to All Section Men, 6 April 1968, file 6, box 16, B7:2-1, Montana Department of Highways Records, MHS.

[54] "Game Management Division, Weed Control Policy," June 1972 (see for quote), file 64, box 1, RS 198, Wildlife Division Records, Montana Department of Fish, Wildlife, and Parks Records, MHS; MDA, NWMAC, "Final Report," 7–9; Noxious Weed Advisory Council Minutes, 10 September 1975, appendix V(a), p. 5, in MDA, NWMAC, "Final Report."

destroying organisms other than weeds. When Montanans tried to reduce or stop the use of 2,4-D, they were, in effect, reaching across boundaries to delineate a still larger community space, an even greater ecological commons.

Yet even as they tried to block the use of herbicides, environmentalists opened an opportunity for alternative methods in cooperative weed control, ones more consistent with ecological conditions as contemporary ecological concepts defined them. Environmentalism and ecological discourse thus did not eclipse the notion of a weed commons, but rather helped to redirect and expand it.

By the 1970s, farmers, ranchers, scientists, and public officials devoted increasing attention and resources to the biological control of weeds. They hoped that imported insects and pathogens would reduce the state's populations of knapweed, Canada thistle, and other unwanted plants. Montana scientists first experimented with biological controls in 1948, but such methods never received as much public support as did chemicals. Circumstances eventually changed people's minds. Farmers and graziers came to share some of the environmentalists' ecological concerns. More important, chemical technology presented economic and environmental problems that restricted its use. The cost of herbicide, machinery, fuel, and labor could be overwhelming, especially for agriculturalists on poor land. Furthermore, by the 1980s, liability insurance had become impossible for some weed districts to purchase. Biological controls seemed to offer an alternative. The movement began in the 1970s, when Ravalli County farmers proposed it to their local weed district. The state of Montana then placed increasing emphasis on the method, sponsoring research and numerous releases of insects and pathogens from the 1970s through the 1990s.[55] In certain respects, biological controls were as utilitarian as chemicals and other forms of weed control. But landowners who released organisms on weeds instantly joined their land and lives to a web of connections that spanned formal boundaries. "Because you have the same weed problem," advocates of the technique wrote in 1993, "your neighbor will eventually receive the benefits of your efforts at biological control. We encourage adjacent landowners to take a look at the big picture, get together, and make coordinated releases. Everyone then shares in the cost and benefits of biological control."[56] In this manner, the interaction of people and organisms transcended the grid and shaped a new version of an ecologically common space.

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[55] Both of these articles can be found in WVF, MSU: Greg Northcutt, "Insects Counter Pesky Weeds," *Bozeman Chronicle*, 22 June 1980 and "Weed Program Plan Given Mixed Reviews," *Great Falls Tribune*, 13 January 1981. See also Gerald W. Marks, "Biological Weed Control," ca. 1980 and Jo Brunner to Pete Fay, 14 May 1981, both in Weed Control files, box 8, acc. no. 87-027, ESR, MSU and MDA, *Noxious Weed Trust Fund*, pp. 2.7, 2.9–2.11. On herbicide problems, see Lorney Faber, "Judith Basin Goes to War With Range Invader," *Lewistown (MT) News-Argus*, 2 December 1979, WFV, MSU and the following, all of which are in box 25, B10:1-1, DOR, MDAR, MHS: Cecil Weeding to Keith Kelly, 21 January 1986, file 13; Kelly to Weeding, 14 February 1986, file 13; Celestine Lacey to Kelly, 18 July 1986, file 14.

[56] Noah Poritz, Leona Poritz, Tony Aiello, "Biological Control of Weeds, 1993," p. 5, file 4, box 31, B10:1-1, DOR, MDAR, MHS.

The evolution of the weed commons did not end here, however. While concerns about chemicals coaxed landowners and weed districts toward biological controls, growing concerns about weeds pushed some environmentalists toward chemicals. Weeds threatened agricultural land, but they also overtook native plants and diminished wildlife habitat. Fearful of weeds, eager to restore desirable plants, impatient with the slow progress of biological methods, some environmentalists and environmental organizations—including representatives of the National Wildlife Federation—began to use herbicides. By the 1990s, a few environmentalists even went so far as to apply chemicals themselves.[57] When they donned protective gear, strapped on backpack sprayers and went after knapweed and other "noxious" plants, they were remarkably like the farmers, ranchers, and extension agents whom they often opposed. Their embrace of chemicals demonstrated once more how the shared problem of weeds could create common bonds among otherwise divided people.

The story of weeds and boundaries in the Montana landscape opens a view on an important problem in western American history, an example of which appeared with stark clarity in early winter 1937 on the windswept field of a depressed and angry farmer named Hugo Zehrfeld. Where an Enlightenment ideal and an ecological reality intersected, Zehrfeld's temper flared. The grid that composed his world was indeed a practical tool for ordering and distributing land, and it enabled rapid settlement, economic development, and the extension of national power. But as Zehrfeld's tumbling tumbleweeds showed, the grid was also a massive republican fantasy, a theoretical structure of uniformity and harmony imposed on a diverse and unstable environment. For westerners such as Zehrfeld, life within the grid involved a struggle to reconcile abstract boundaries with material conditions, to contain things that were inherently uncontainable. The struggle absorbed a good deal of time and energy, and it became most acute when the ambitions that motivated the Great Land Rush ended, as it did for Zehrfeld and other remnants of Montana settler society, in drought, depression, failure, and weeds.

Disturbed boundaries, however, also created opportunities for westerners to negotiate the contradiction between the grid and unstable nature. Their solutions—options unavailable to Hugo Zehrfeld—favored the collective over the individual and tacitly acknowledged a shared environment. In the case of weeds, landholders sometimes worked together informally to remove unwanted plants, or pressured negligent neighbors to take action. With the conclusion of the Great Land Rush and the advent of the Great Depression, the methods became more formal. Seldom studied by scholars, state and local land policies created weed districts that were members of a family of

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[57] Bill Thomas to Celestine Lacey, 3 July 1986 and Celestine Lacey to Keith Kelly, 18 July 1986, file 14, box 25, B10:1-1, DOR, MDAR, MHS; Richard Manning, *Grassland: The History, Biology, Politics, and Promise of the American Prairie* (New York, 1995), 188–90; Dan Flores, *The Natural West: Environmental History in the Great Plains and Rocky Mountains* (Norman, 2001), 193–9.

organizations that included agricultural cooperatives, irrigation districts, and other small-government entities. They harkened back to John Wesley Powell's plan for watershed commonwealths. They bore the impress of New Deal planning, although in practice they were profoundly local in character and involved little centralized governmental authority.[58] They also appeared in other western states and addressed not just weeds, but water, rodents, insects, and fire. Whatever form they took, weed districts and other collective responses to mobile nature were expressions of a hybrid human ecology that recognized property boundaries, but operated in common geographic space. Each response played a role in defining an ecological commons that adjusted the individualism of gridded units to the ecological realities of transboundary nature.

The history of Montana's weedy common spaces provides an alternative perspective on ordinary rural western landscapes. The simple categories of private and public do not adequately convey the historical and geographical textures of such places. As Bonnie McCay and James Acheson have stated, landscape analysis requires the "careful examination of the ways that people understand and relate to their environments, and of the ways ownership—common or exclusive—works in specific cultural and ecological settings."[59] Many forms of private land have existed in the West, with many different owners, occupants, tenures, rules, and regulations.[60] The region also has encompassed a range of public lands and spaces, with a correspondingly diverse array of uses, customs, and laws. These multifarious private and public lands have not existed apart, but have been connected to and have overlapped one another.[61] Montana provides one example of such complexity. Consider the mixed private/public geography that characterized many places around the state from the 1930s onward. Membership in a grazing commons required a grazier to have a certain amount of improved, private, "commensurate" land on which to keep animals and grow fodder. This private land in turn took on value because it drew water from a common property irrigation canal. A network of public roadways linked these areas to other places. The range, canal, private pastures, fields, and roads might exist within a weed district. These spaces and their relationships, furthermore, were never stable. Economic and environmental changes shaped and reshaped them, as did human relationships that

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[58] Report of the Great Plains Committee, *The Future of the Great Plains*, 71–89, 105–20, 133–91; Carl Frederick Kraenzel, *The Great Plains in Transition* (Norman, 1955), 278–82, 384–7; John C. Bollens, *Special District Governments in the United States* (Berkeley, 1957), 139–78.

[59] McCay and Acheson, "Human Ecology of the Commons," in *The Question of the Commons*, 15.

[60] See, for example, Roland R. Renne, *Montana Land Ownership: An Analysis of the Ownership Pattern and Its Significance in Land Use Planning*, Montana Agricultural Experiment Station Bulletin 322 (Bozeman, 1936).

[61] On the complex, contested connections between public land and private property, see Karen R. Merrill, *Public Lands and Political Meaning: Ranchers, the Government, and the Property Between Them* (Berkeley, 2002).

could be formal as well as informal, cooperative as well as contentious. These, then, were the kinds of spatial patterns that constituted rural western landscapes and that this essay, in its own way, has tried to depict.

If the history of the weedy West opens a different view on the past, perhaps it also opens a window on a potential western future. It would be unrealistic to think that collective responses to the movement of nature through the grid can provide perfect models for resolving the West's many land-use problems. Those responses were often limited and ineffective; in combination with mechanical, chemical, and biological methods, they did not stop, much less turn back, the spread of weeds through the Montana landscape. And yet westerners could do worse than to seek inspiration in moments when experiment station scientists tried to understand weeds in their complexity, when bureaucrats quoted Aldo Leopold, or when farmers backed away from herbicides while environmentalists turned toward them. They could do worse than to find lessons in the moments when, in contrast to Hugo Zehrfeld and his fractious neighbor, people acknowledged shared environmental predicaments and sought to resolve them through a popular discourse of community, commonality, and cooperation. Those terms may not have conveyed precisely the same meaning to farmers, scientists, environmentalists, and others, but they at least brought citizens together in the same conversation in the same room.[62] Perhaps in such common spaces, linguistic and geographic, westerners collectively can fashion pragmatic solutions that promote individual interests by furthering the public good.

[62] Daniel Kemmis, *Community and the Politics of Place* (Norman, 1990), argues that a shared landscape and the common experience of place can serve as the basis of an effective political order.