



Our Disappearing Rangelands

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Introduction

Today, in an age of throw away societies, urban development, and indifference to the world around us, our rangelands are disappearing at a rate of *175 acres an hour*. Rangelands, which provide recreation, food, fiber, and natural beauty, are being consumed by urban development, causing damage to natural ecosystems, wildlife migration patterns, gene pools, and production of human food and fiber. As a variety of organizations struggle to limit the effects of urbanization and conserve our rangelands, farmers and ranchers struggle with mental health and the increasing costs of living, labor, and production.

Rangeland Ecosystems

In today's world of research, science, and logic, there are many different definitions for rangeland. The most basic and common definition of rangeland is a kind of land that supports native forbs, shrubs, and grasses, and is managed using the ecological principals of the mineral cycle, water cycle, energy flow, and community succession. Healthy rangelands provide a plethora of ecological goods and services such as forage, fiber, clean water, biofuels, recreation, climate mitigation, rich biodiversity, open space, and cultural heritage. Forage grown on rangeland is used for grazing or occasionally hay production that sustains ranching enterprises. In addition to livestock production, fishing and hunting are two of the other major industries that

are heavily dependent on rangeland and provide a major source of income for many ranches. Sale of licenses, gear, guides, firearms, and bottled water for hunting and fishing on rangelands generated \$25 billion in revenue in 2001. Rangelands also support beef and lamb production for meat and fiber, which provide a way of life for ranching operations. Cash receipts for cattle and calves exceeded \$67 billion in 2016 in the United States alone. (Mathew C. Reeves, 2018)

Federal and nonfederal rangelands produced approximately 399,567,000 animal unit months (AUMs) of forage (an estimate based on 800 pounds per month of forage for beef cattle in 1985). This forage supports the production of beef, lamb, and other livestock. Rangeland watersheds aid in regulating the quality of water in streams, lakes, rivers, and aquifers. (National Research Council; Board on Agriculture; Committee on Rangeland Classification , 1994) Rangelands are also vital for the survival of 84% of mammalian and 74% of avian species in the United States. (National Research Council; Board on Agriculture; Committee on Rangeland Classification , 1994)

Urban Sprawl and Fragmentation

Today, these precious values and services provided by rangelands are under siege from a combination of land fragmentation and urban sprawl. The loss of productive rangeland is in direct correlation with the rapid population growth in the Intermountain West, Pacific Northwest, Southwest, and the Great Basin Regions. Today, approximately 80% of recent housing developments in the United States have been in regions outside of urban centers. The main type of development which is consuming rangelands across the United States is “Sprawl,” a developmental pattern identified by its low-density, haphazard growth that spirals away from urban centers. Sprawl is most often characterized by the sudden abundance of residential housing

on land that was previously a working ranch. Residences built in Sprawl areas are generally located on average sized lots, have approximately the same number of dwellings in each neighborhood, and floor space suitable for a single family. Those who take up residence in Sprawl developments rely heavily on automobiles because Sprawl generally covers large expanses of land. Other types of land development include Dispersed Development and Ribbon Development. Dispersed Development occurs on parcels of land located away from developed areas while Ribbon Development is located along roads and extends away from urban centers.

Urban Development and Effects on Rangeland

The encroachment of urban development affects open spaces, agricultural lands, and rural communities as it blurs the lines between urban and rural areas. The devastation of rangelands rapidly unfurls due to many factors. One of the foremost influencing factors is population growth. As population grows, there are more and more families seeking the American dream of homeownership. This dream often includes a desire for a yard in a low-density neighborhood. Another factor is rising income. As people begin to earn higher wages and their family grows, they are more likely to desire a larger home with more living space. Housing in developed suburban areas on the borders of metropolitan areas tends to be less expensive, giving more families the opportunity to move into these low-density housing developments. Living in the suburbs of major metropolitan areas also decreases commuting costs due to investments in transportation, infrastructure, and proximity to metropolitan areas. Finally, urban development tends to lower the price of land directly along developing edges of urban centers, further encouraging development. A combination of these factors often creates a snowball effect. As new developments are built, new residents move in. These new residents then demand

improvements in infrastructure. Improvements in infrastructure then encourage further land development, creating new opportunities for residential and commercial use. (Brody, 2013)

Since 1982, 31 million acres of U.S. agricultural lands have been lost to urban expansion. (GAP Initiative, n.d.) This is approximately the size of most of the state of Iowa or the state of New York. (Ann Sorensen, 2020) Of the 31 million acres of agricultural land that has been lost, 10.7 million acres were rangeland. (Society for Rangeland Management, 2003) Today, one hundred seventy-five acres of farm and ranch land are lost *every hour*, and worse yet, the land that is being lost is some of the most productive land in the country. (GAP Initiative, n.d.)

Fragmentation of rangeland habitat effects wildlife nesting, predation, wildlife movement, and the structure of habitats and ecosystems. Highways, energy development, tourism, and urban development disturb wildlife migration routes while more human tolerant species gradually outcompete less human tolerant species. This causes a decrease in biodiversity, limited gene flow between populations of wildlife, population isolation, a decrease in genetic diversity, and an increase in non-native and invasive species. Sprawl and fragmentation can also cause a decrease in food, fiber, and scenic quality, as well as an increased chance of wildfires. (Mathew C. Reeves, 2018) Rangelands are one of the most endangered ecosystems in the world and the birds that depend on rangelands are just as at risk as the land on which they once flourished. Since 1966, grassland bird populations have decreased by approximately 40% as their habitat continues to dwindle. Some of the most heavily impacted species of birds include the Henslowe's Sparrow, Greater Prairie-Chicken, Vesper Sparrow, Eastern Meadowlark, Baird's Sparrow, Long-billed Curlew, and the Western Meadowlark. Sadly, these are only a few of the many threatened birds that historically spanned the breadth of the vast rangelands of our nation. (Wilsey, 2019)

Rangeland birds are not the only creatures caught in the onslaught of urbanization. A diverse

array of rangeland forbs with overlapping bloom periods provide necessary habitat for both native and migratory pollinators. Bare ground and hollow grass stems provide nesting grounds for pollinators while wood debris and leaf litter provide overwintering shelter for invertebrates such as beetles, flies, and wasps. The Mining Bee *Andrena helianthiformis* and the Regal Fritillary Butterfly *Speyeria idalia* are two species that are endemic to rangelands and dependent on purple coneflowers and grassland violets, respectively. Rangelands also provide essential breeding grounds for Monarch Butterflies during the growing season. As the domain of rangelands continues to decrease, so does the limited and essential habitat of these and many other endangered and threatened species. (Sarah Hamilton Buxton, 2021) To keep this in perspective, it is important to acknowledge that pollinators are essential in a wide variety of ways, including being responsible for one out of every three bites of food we eat.

Rangeland hydrology is another aspect of rangelands that is negatively impacted by urbanization. When fragmentation and urbanization occur, it increases the amount of bare ground cover, causing a concentration in the flow of storm water. When the flow of storm water is increased, the risk of flooding and erosion of local waterways also increases. This leads to a decreased level in aquifers because water is not allowed to infiltrate the soil. As much as half to two-thirds of all storm water washes downstream rather than being absorbed into the soil. Alluvial aquifers, which are typically located near streams, reservoirs, and lakes can be flooded beyond their normal level during a storm, increasing the chance that Russian Olive and Tamarisk, two highly invasive plants, will begin to grow. Other alluvial aquifers may not absorb enough water to power streams, thus turning many perennial (year-round) streams into ephemeral (dry) streams. Water levels in deep aquifers, which can take thousands of years to develop, are harder to monitor due to their depth. The health of these aquifers is harder to gauge as

they are harder to access than alluvial aquifers. Weed species can also begin to outcompete many native plants because they are more tolerant to dry soils and unpredictable water patterns. (Blake Osborn, 2023) As urban developments are built, they cause a decrease in plant surface cover and an increase in bare ground cover. Plant root systems improve soil structure and health, helping to prevent erosion and increase water infiltration. With an increase in bare ground cover, storm water is concentrated and detained until it can be released back into waterways. The magnitude of water that is released can cause erosion, washing excessive sediments into waterways. Excessive sediments in waterways are considered a pollutant, much in the same way as sewage effluents and industrial wastes. (Sedivec, 1992)

Urban Sprawl and Fragmentation Mitigation

Controlling the spread of urban sprawl and minimizing the effects of fragmentation is a tall task that has no one single solution. Some methods that are used to control urban sprawl include subdivision regulations, zoning provisions, building permits, and urban growth boundaries that prevent development. Other methods include special taxing districts, clustering houses, and density bonuses for developers. Some places use targeted public investing and conservation easements to protect open land while others invest in educational outreach programs to raise public awareness. (Brody, 2013) Karla Melgar, a CSU Extension Small Acreage Management Specialist from Longmont, is one of many specialists who hosts workshops for the public to learn about land management. In these workshops, she teaches attendees about the life cycle of grass and basic grass management techniques. These workshops provide educational opportunities for members of the community who don't have the experience with agriculture that most ranchers and farmers would have. "These workshops give people some

independence and understanding of agriculture.” – Karla Melgar. Not only does Karla Melgar host workshops for the public, but she also travels across the Front Range working for the CSU Extension Office and NRCS, teaching small acreage property owners how to properly manage their land. Karla advises them on soil health, cover crops, plant life cycles, and financial aid for restoration. She also helps settle disputes between neighbors related to their property management. The greatest disputes are between neighbors with disagreeing views on weed and prairie dog management. Karla advises that the best way to resolve conflicts on range management is by increasing educational opportunities and changing the perspectives not only of individuals but of organizations such as HOAs as well. By educating individuals and organizations such as HOAs, people and communities can develop an increased understanding of their local environment, such as the limited water supply on the Colorado Front Range and create better informed standards for their organizations. (Melgar, 2023)

Open Space programs, which work to conserve rangelands by purchasing parcels of land, or their development rights, use taxpayer dollars to create conservation easements. One such place is Boulder County, where the Boulder County Parks & Open Space’s 100,000-acre program boasts 26,000 acres of agricultural land with 128 different leases and 65 different private tenants. As one of the oldest Open Space programs in the nation, Boulder County has a variety of agricultural leased parcels ranging in size from five to 20-acre market farm parcels to 1000-acre diversified crop leases and 2,000-acre rangeland parcels. The leased lands are managed to fulfill mixed purposes: recreation, agriculture, and wildlife habitat. Some of these parcels are surrounded by urban areas, while others are in more rural portions of the county. Considering both the lands owned outright and the lands with conservation rights, the Boulder County Parks & Open Space program holds 7,500 acres of rangeland and an additional 2,000

acres of former dryland cropland that has been restored to rangeland vegetation. The Open Space program is dedicated to preserving rangelands while also supporting local agriculture and ranching families by providing an economically viable, family-friendly, enjoyable, and flexible leasing system that emphasizes good stewardship rather than earning rent revenue. Keeping producers' operations viable is important. The entire program is supported by the citizens of Boulder County, who have voted several times to tax themselves to buy and preserve land in order to prevent development and control urban sprawl. (Alexander, 2023) Boulder County's Open Space program is only one powerful example of the many ways rangeland is being conserved across our nation. Boulder County as well as other conservation-oriented entities use conservation easements to protect rangeland, helping to control urban sprawl and reduce fragmentation of rangelands. These easements preserve the productive capacity of the land while allowing landowners to retain all other rights of ownership. When the land is placed in an easement, two appraisals of the property value are made. The first appraisal is of the current, unencumbered state and the second is the value under the restricted terms of the conservation easement. The difference in values between the two appraisals determines the compensation the landowner is given for placing the property in the easement. Conservation easements do cause a 35 to 65% reduction in property value based on the extent of the restrictions of the easement, location, and property type, though value may continue to appreciate over time. (Partnership of Rangeland Trusts)

Private agencies and local governments are taking additional steps to protect our rangelands. The Farm Bill is a piece of legislation that originated in the 1930's and is renewed every five years. Though this bill is not specific to rangeland, it is dedicated to natural resource conservation, nutrition, rural development, research, forestry, energy, horticulture, and crop

insurance. The 2018 renewal of the Farm Bill, titled *The Agriculture Improvement Act*, cost \$428 billion, and expired in 2023. Another piece of legislation dedicated to conservation, and specifically related to rangeland management, is the North American Grasslands Conservation Act, which provides resources for farmers, ranchers, and tribes to voluntarily prevent the loss of grassland. This act provides for a series of councils on state, tribal, and federal levels with representatives from farming, ranching, and grazing communities. The emphasis within this act is to have councils work closely with private landowners to build strong partnerships and create the opportunity for voluntary and incentive based grant programs that are flexible and available to a variety of landowners. (Andrew Wilkins, 2023) The Grassland Conservation Reserve Program (CRP) is another federally funded conservation program, created by Congress in 2014 during the renewal of the 2014 Farm Bill, that contracts with voluntary producers to preserve environmentally sensitive grasslands that are in danger of being converted for other uses. (United States Department of Agriculture, n.d.) In exchange for enrolling land in the Grasslands CRP, landowners are compensated 75% of the grazing value of their land (Iowa Cattlemen's Association, 2015) or a minimum of \$13 per acre. Throughout the duration of the Grasslands CRP contract, which spans 10 to 15 years, Grasslands CRP and the NRCS will aid landowners in developing long term conservation plans and pay a percentage of costs incurred while landowners are in the process of implementing conservation plans. (Western Landowners Alliance, 2023)

Urban Sprawl Effects on Ranching Livelihoods

As urban development and sprawl ravages rangelands across the country, it is not only wildlife and natural ecosystems which are suffering; the farmers and ranchers whose livelihoods

depend on the land are also suffering. Producers in areas in which urban development runs rampant not only struggle with traditional complications such as livestock predators and drought, but also the added complication of people who do not understand agricultural work. Neighbors complain about noise, dust, and the smell of manure. The cost-of-living and the cost of production in urban areas continue to increase compared to more rural areas, making it difficult not only for producers to find housing, but labor as well. Fencing is often constructed of five wires opposed to the traditional three wire fence because of safety concerns, and these fences must be maintained more frequently to prevent livestock from getting out on busy roads and highways. The need to keep livestock content and quiet to appease the neighbors can lead to over conditioning. Over conditioning, or excess feeding, leads to higher feed bills, which in turn, leads to a loss of profit. A combination of fragmented land, a lack of livestock facilities, and heavy traffic makes it difficult to rotationally graze livestock. Traffic can also make it difficult and dangerous to transfer ranching equipment. Moving equipment or livestock based on traffic rather than on the correct time for grazing management objectives costs producers time and money. A combination of these factors can lead to a decrease in the quality of the final product and increased stress for producers. The mental health of our producers suffers as significantly as the land to which their lives are tied and where their family roots have grown. (Alexander, 2023)

Today, less than two percent of people in the U.S. work on a farm or ranch. (Farm Bureau, 2023)

The average age of a farmer or rancher in the United States is currently 65, one of the highest average ages in any industry in the nation. As the pressures of urbanism increase and more and more farmers and ranchers retire, fewer people are willing to take up the mantle of their forebears, leading to a decrease in producers and increased costs of agricultural products. (Alexander, 2023)

Conclusion

Our rangelands are suffocating under the weight of urban development. The conservation efforts made by agencies across the nation are vital, not only for those whose lives are directly rooted in the land, but also for the general public. Nature is an intrinsic part of humanity, as deeply ingrained in us as the fear of the dark or the desire to be loved. It is imperative for us to be aware of the plight of our rangelands and to achieve an understanding of its value in the cycle of life.

“When a person has access to see what is going on in agriculture and they see the cycle of crops being planted, everything in harvest, crop rotation, livestock, and the producers working, haying equipment, they see the growth and changes through the seasons. They see the crops grow and mature and be harvested. They are able to see baby calves be born and grow. There is a huge societal benefit when people have that simple connection. Most people in urban areas lose a lot of their opportunity to be connected to the land. ... It’s a basic human need to be connected to the land. You are worse off as a person if you don’t have some connection to the land. The people of Boulder County have preserved their connection. ... It makes it all the challenges worth it, even though it is hard.”-

Robert Alexander

Conserving our rangelands is crucial to preserving our own humanity. When people are able to see the cycle of life and death and the labor that is poured into rangelands in order to raise livestock and conserve natural habitat, they develop a greater sense of respect for life. The conservation of these lands cannot be accomplished only by conservation organizations for the tide of urban development is too great to withstand alone. It must be a national effort fueled by

the desire to leave the world better than we have found it. People across the nation can help to preserve these crucial lands in many ways. One way individuals can aid in reducing the negative impacts of fragmentation of rangeland is by participating in educational outreach programs hosted by local, state, and national conservation agencies, and international organizations such as the Society for Range Management (SRM). Knowledge is power that can build a better world while ignorance and inexperience can lead to its destruction. Other ways in which people can help to conserve rangelands is by supporting their local ranchers through purchasing their products. Ranchers work the closest with rangeland and it is their stewardship that supports the lands. By purchasing their products, you are ensuring their livelihoods and ability to care for rangelands across the country. Other ways people can help to maintain rangelands impacted by urban sprawl is by picking up their garbage and not littering. Helping to prevent litter from making its way into rangelands is an easy way for individuals to protect natural resources. Finally, people can support their local conservation district by donating money or volunteering to help with conservation efforts.

Our society has become negligent and detached from the world around us. We must preserve our natural rangelands in order that every man, woman, and child may know, see, and understand the value of life and the land which feeds and clothes them. Every hour, 175 acres of rangeland is plowed under to provide spacious, luxurious urban homes, and every hour, more of our rangeland which provides us valuable food, fiber, and clean water, is lost forever. We must rally and protect our rangelands. Whether through Open Space programs such as the Boulder County Parks & Open Space program, or other methods of conservation, we must protect our rangelands, not only for ourselves, but for future generations to enjoy and for the many ecosystem goods and services rangelands provide.

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