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# “In Every Rancher’s Mind”: Effects of Drought on Ranch Planning and Practice

By Hailey Wilmer, Elisabeth York, Windy K. Kelley, and Mark W. Brunson

## On the Ground

- Ranchers’ responses to drought differ depending on where they live and specific circumstances of their ranches, but there are striking similarities across regions.
- Changes in practice after a drought reflect a general desire to buffer one’s operation against disruptions, rather than being specifically aimed at the next drought.
- Interviewees often pointed to good things that arose from the bad situation of drought.
- Energy development helped offset drought impacts in two cases, but interviewees generally preferred to diversify their income streams through agricultural rather than non-agricultural enterprises.
- Ability to respond to drought is somewhat constrained by federal tax laws and agency grazing regulations, as well as by ranchers’ specific circumstances.

**Keywords:** drought, income diversification, management adaptation, ranch planning, recovery.

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Rangeland managers and stewards have dealt with drought for generations. Drought planning is an important tool for minimizing drought-related losses and speeding recovery after a drought has ended, yet many managers fail to use it.<sup>1,2</sup> To better understand how rangeland stewards perceive drought and their options for responding to it, we interviewed some of the managers who are among the most closely connected to rangelands—ranchers.

Like the rangelands on which they depend, ranchers’ operations are complex and dynamic.<sup>3</sup> They vary by topography,

soils, plant communities, and water distribution, and are affected by specific human and economic contexts as well as previous years’ conditions and impacts. Therefore, we sought to learn from ranchers who operate in different US regions and are affected by different contexts, focusing west of the Mississippi River. Our purpose was to learn from a sampling of ranchers who had come through a drought and continued to operate, hearing in their own words how they experienced the drought and how it affected their subsequent operations.

We interviewed seven ranchers in the Great Plains and Colorado Plateau (Table 1). Two interviewees were already participating in existing research collaborations with one of the authors, while others were contacted solely for this effort. Interviews were conducted in a conversational style, but the questions we asked were similar for all interviews, using a protocol that was reviewed by the Institutional Review Boards at both Colorado State University<sup>i</sup> and Utah State University<sup>ii</sup>. Two of the ranchers took part in repeat interviews during the summers of 2012, 2014, and 2015 while the others were interviewed once in Fall 2015. Information for this article was drawn almost entirely from the 2015 interviews, which took place at a time when drought was not a serious concern and interviewees had had a chance to reflect on past droughts and subsequent recovery.

These are stories of ranchers and their interactions with drought. This article was designed to enable our interviewees to share about their experiences and responses to drought. These stories are not necessarily representative of ranchers throughout their regions. Yet while we found some regional differences, what stood out the most about the stories these ranchers shared are the similarities in how they perceive and respond to the threat of drought.

## People and Places

Of the seven people we interviewed, five are the primary decision-makers on their properties. One individual is a

<sup>i</sup> CSU IRB protocols 10-1829H, 11-3178H and 12-3381H.

<sup>ii</sup> USU IRB protocol 7035.

**Table 1. Ranch characteristics**

<b>Location</b>	<b>E. Colorado shortgrass</b>	<b>E. Colorado shortgrass</b>	<b>Southern Utah</b>	<b>Southern Utah</b>	<b>Southern Utah/N. Arizona</b>	<b>Western Oklahoma</b>	<b>Kansas</b>
<b>Operators</b>	Cooperative between 2 generations, no hired labor	Male primary operator, hired hand	Male primary	Male primary	Male primary	Male primary	Male primary (passed down to son)
<b>Gender</b>	2 women, 1 man	Male	Male	Male	Male	Male	Male
<b>Type of operation</b>	Cow-calf and private lands leasing	Cow-calf	Cow-calf and sheep	Cow-calf and sheep	Cow-calf	“Stock farmer”	Custom grazing
<b>Public/Private</b>	Public and private	Public and private	Public and private	Public and private	Public and private	Private	Private
<b>Rotational grazing?</b>	On private land	Yes	Yes	Yes but weather dependent as well	Yes	No set schedule but does rotate	Yes
<b>History</b>	Multi-generational	1 <sup>st</sup> generation	5 <sup>th</sup> generation	5 <sup>th</sup> generation	5 <sup>th</sup> generation	1 <sup>st</sup> generation, but married into 4 <sup>th</sup> generation	5 <sup>th</sup> generation
<b>Diversification</b>	Energy development, off-ranch employment	Energy, forage crops	Off-ranch employment	Targeted grazing	Custom brush-clearing and mowing	Off-ranch employment	US Fish & Wildlife Service partnership

longtime rancher who has turned daily decision-making over to his son and a business partner, but still lives on the ranch and is actively engaged in the operation, and another interviewee has a combined operation managed cooperatively by members of two generations. Most operate multi-generational ranches, although one interviewee married into his ranch and another purchased his property in the late 1990s after working in the hospitality industry. Their operations span mixed-grass prairie with some woody encroachment in western Oklahoma and south-central Kansas, short-grass steppe in Colorado, and various combinations of sagebrush desert, oak or juniper woodland, and conifer forest in southern Utah and northern Arizona. All graze cattle, but with differences in how those cattle are managed. While several run cow-calf operations, two interviewees open their land to other ranchers' cattle. The Utah ranchers and one in Colorado operate part of the year on public land allotments, while the Oklahoma producer grazes two leased pastures and prefers to call himself a "stock farmer" rather than a rancher. Two of the Utah producers also run sheep, and a couple of interviewees also have irrigated cropland as part of their operations.

### Overall Ranch Management

When asked about the goals that guided their management efforts, most interviewees said maintaining economic viability is the most critical goal. However, nearly everyone also noted the importance of wildlife and rangeland stewardship—that is, they generally emphasize long-term improvement of rangeland health and habitat, working with nature rather than focusing only on how many pounds of beef they can produce. Lifestyle is also an important consideration, especially for those who have younger families and believe a ranch upbringing is best for their children. One rancher also mentioned a goal of demonstrating good stewardship to the public, in order to help improve overall trust in ranchers and ranching as a land use and way of life.

Everyone we spoke with mentioned the need to manage adaptively, basing their grazing decisions not only on pre-determined plans but also on what they observe as the year progresses. As one of our Great Plains ranchers noted, "It's more of an art of knowing when to move cattle and when they need to be somewhere." While all reported some year-to-year variation in grazing strategy, the ways in which their management varies differ—for some it's the timing (duration or season) of grazing, for others the stocking rate. Where possible, they use rotational grazing systems. The multi-generational Colorado ranch builds flexibility into the operation by using more than one grazing approach even within the operation. By leasing part of its deeded land, the family gained flexibility in the use of management and labor resources to help sustain the cow-calf herd on the public lands side of the operation. The ranchers who operate partly on public land mentioned that their flexibility is limited on BLM or Forest Service allotments by specific conditions attached to their grazing leases, but they also report close collaboration

with agency personnel to help them adapt to the conditions of a particular year.

Everyone we interviewed reported making some changes in their operations, not only in response to drought or other stresses on the operation, but as part of a general belief that innovation has contributed positively to their success and will do so in the future. The nature of those changes differed considerably, however. Some have been very active in vegetation control, especially reducing woody encroachment with herbicides and mechanical treatments. One in Utah has been enhancing greater sage-grouse habitat through careful management of his sheep. Two of the Utah ranchers have aggressively developed new water sources while the Kansas rancher has been shifting away from using the ponds he developed in the 1980s to relying on water pumped into troughs.

### Drought and Its Aftermath

We selected our interviewees from regions where the US Department of Agriculture had reported drought within the past five years. Nonetheless, not everyone we spoke with agreed with that characterization. While one Utah rancher said he had experienced a drought earlier in the decade, the other two did not. The discrepancy may be due to the fact that Arizona and Utah are consistently drier than other regions; ranchers there may not always distinguish between true droughts, when water availability falls below normal levels to the extent that it limits normal land uses,<sup>4</sup> and typical dry conditions. As one Utah rancher said: "Believe me, in every rancher's mind they're always thinking about those toughest years that they've experienced. . . . Every time it hasn't rained for three or four weeks we think, 'Oh, we're in another drought'."

Drought was very much on the mind of the Southern Plains ranchers we spoke with as well, but for a different reason: the severity of the drought experienced in 2011 to 2014. Even then, however, there were differences in perception. While one of our interviewees spoke with obvious relief of the recent drought as having ended, another observed, "Are we over it? I don't think so," pointing to predictions of a strong El Niño in the winter of 2015 to 2016. For our interviewees from the Southern Plains, where the drought effects were most severe, the drought was a psychological crisis as well as an environmental one. They reported feeling powerless, and were struck by the effects on the land and nature as well as on their livelihoods. As one rancher remarked: "Walking out every day and your yard is brown and crunchy, and the trees are dying, and the creek's dried up and, you know, you see little deer abandoned—it was real depressing. After awhile it works on your mind."

Drought also adds additional stress on top of other events on a ranch. For example, one rancher in Colorado was strained by loss of forage resources and income from drought in 2012. This lowered his resilience in the face of a second external force in 2013: increased dust from a nearby energy development, exacerbated by the drought, which led to respiratory problems in his calves. Thus he was dealt double financial and psychological blows.

For most interviewees, the primary response during the drought was destocking. The Oklahoma rancher estimated that in his county about 80% of the cattle were gone by the latter years of the drought there. When conditions allowed him to restock, he used the opportunity to improve his herd genetics. In Colorado, a severe drought in the early 2000s led to a reorganization of the multigenerational ranch, as the younger generation sold their cattle herd and began leasing their pastures. Destocking is a natural response but can also be a financially perilous one. Uncertainty about how long a drought will last can lead to delay in destocking,<sup>3</sup> so that when they finally do so ranchers often find themselves adding cattle to a market where supply greatly exceeds demand, then trying to restock at a time when demand outstrips supply. “Cows you sold for \$500 are now worth \$2,500 since things are better,” said one rancher, who also noted that when an entire herd is sold the temporary boost in income could have significant implications for taxes and student financial aid calculations. The solution, said another rancher, is to destock early rather than trying to hold out as long as possible. He recalled a time in June to July 1998 when drought indicators told him he should destock, which he did. “In August we got 9 inches of rain [which] made my recovery for the next year spectacular. I grew forage while my neighbors were still grazing, and they overgrazed.”

An interesting adaptation in Colorado was an interviewee who reported having improvised a unique partial-destocking solution during the worst of a drought. He acquired some Holstein cows, then sold his beef cows three weeks after they had calved and put the calves “four deep” on the Holsteins to nurse, weaning them as soon as possible. As a result he was able to reduce the part of his herd that put the greatest demand on grass, and was able to rebuild his herd earlier because he had maintained the calf side of the operation as much as he could.

Federal government programs also helped some interviewees weather the drought. Two participated in the federal Disaster Assistance Program for livestock. One entered into a new partnership with the US Fish & Wildlife Service. Several respondents also pointed to the ways in which local communities had banded together to help each other get through the worst of the drought. For example, the Oklahoma rancher noted that during the worst of the drought, friends had let him move his animals onto their land for a few months so his own pastures could rest, and a Utah rancher described how neighbors helped him develop new water catchments to buffer against drought.

A striking aspect of our interviews was that several people made a point of finding the silver lining in the cloud that is drought. Ranchers in Colorado noted that larkspur toxicity was reduced during drought years. Several respondents noted that they had used the experience to seek ways to improve their operations going forward—for example, by improving herd genetics when restocking after the 2011 to 2014 drought in the Southern Plains.

Income diversification often is suggested as a strategy for coping with drought. We had expected to hear that drought had forced several of our interviewees to seek employment off ranch,

but only one did. Likely this was because all but one interviewee already had some off-ranch income sources, either from their own work or that of a family member. For example, off-ranch employment is common in Utah, where one interviewee observed with perhaps a slight exaggeration, “You know, to live in southern Utah and actually survive you have to have 3 to 5 jobs, so I fit that mold.” Where diversification has occurred as an adaptation strategy, our interviewees tended to prefer agricultural to non-agricultural enterprises. The two Utah ranchers who run sheep as well as cattle reported that this helped buffer against drought because sheep eat different plants and can browse shrubs. Another ranch is developing a new market for grass-finished beef. Two interviewees had considered starting non-agricultural enterprises—one through agri-tourism and the other through energy development—but decided against it to sustain their current lifestyles. On the other hand, interviewees in eastern Colorado reported beneficial effects of a boom in oil and gas development. Interviewees on one Colorado ranch noted that energy development gives them some room to survive the financial hit from drought, make improvements on the ranch, or spend less time at off-ranch jobs. Even if these benefits are not very large, they’re hugely important for psychological well being, especially for operations that teeter on the very edge of being profitable. For example, one rancher reported that energy income allowed him to spend time training his dog, take a vacation with his wife for the first time in years, and buy himself a badly needed new hat.

### Varied Views on Drought Planning

We had expected our interviewees to report that experiencing a drought had brought home to them the importance of planning for the next drought. The responses we got were more nuanced than that. One of our interviewees is well known in his region for drought planning based on careful gathering of data about rainfall and its relationship to forage production. He speaks enthusiastically and often about the importance of drought planning. Similarly, the Colorado ranchers described talking with family and neighbors about a potential plan of action as drought unfolded on their operations. One rancher emphasized the importance of planning for drought and for swings in the cattle market. He relies on consulting from both market analysts and climatologists, and has used dendrochronology (analysis of data from tree rings) to better understand historic drought patterns on his ranch.

Yet others among our interviewees were less interested in planning specifically for drought, although they also noted that the possibility of drought is always in the backs of their minds. Our Utah interviewees were not focused on drought in particular, but on generally trying to become better ranchers. They defined their efforts as creating bigger buffers against uncertainty and unexpected events that could include not only drought but also wildfire, late blizzards, energy price spikes, or other natural and human-caused stressors. Their means of adaptation included increasing water sources to better distribute to cattle on the range, and maintaining larger hay stocks, changes that are useful in drought but also valuable for



other reasons. One suggested that drought had heightened his vigilance, and that vigilance would probably benefit him in the future whether drought was a problem or not. These ranchers suggested that management change is second nature to them. As one remarked, “I’m not done [making changes] yet. My wife says I won’t be done until I die. So I’m going to just keep working at things.”

An unanticipated side effect of a drought as severe as the 2011 to 2014 Southern Plains event might be a feeling that such a disaster can be too big to plan for. As our Oklahoma interviewee said, “This one was actually worse than the Dust Bowl. ... I’ve never experienced anything like that and I’ll never see it again, so I really didn’t understand the magnitude and I didn’t really plan—there’s no way to prepare myself for that.” Similarly, a Colorado rancher said that while he emphasized planning and adaptation going *into* the drought of 2012, he came out of the drought with a heightened respect for the complexity and power of “Mother Nature”. He observed that the drought had made him question his ability to fully understand or plan for the effects of drought.

### Barriers to Recovery from Drought

Several of the ranchers we spoke with also identified barriers to recovery from drought.

One of those barriers is waiting too late to destock, not only because sale prices will be abnormally low but also because the land will take longer to recover in such cases. A Great Plains rancher spoke eloquently about what he sees as a dangerous tendency for ranchers to focus too much on producing pounds of beef and not enough on their soil and forage resources. “They don’t talk about ecological management, they talk about commodity agriculture,” he remarked, suggesting that by focusing too much on livestock, the health of the land during and after a drought can be forgotten. Other barriers to recovery identified by our interviewees included constraints imposed by federal lease terms and tax laws, as well as age and finances. Federal grazing leases specify dates when animals may graze an allotment, making it more difficult to respond to drought conditions by adjusting seasons of use. One respondent observed that federal tax structure can impede rapid response to drought: if a producer destocks early and sells all or part of the herd, the income is treated as a capital gain that is heavily taxed. This, in turn, can lead to a shift in income tax bracket and college financial aid eligibility, making it more difficult to retain the cash needed to restock when the drought is over.

Rebuilding can take years and have a lasting impact on an operation’s financial viability. For older ranchers, it may be more difficult to face the prospect of starting over and they may be more inclined to sell out. Given that the average age of ranchers has been increasing for years,<sup>5</sup> this last factor may have major implications for how recovery unfolds after future droughts.

### Seeking Ideas for Coping with Future Droughts

Previous research has found that ranchers differ in their adaptation strategies with respect to drought, and therefore they

may benefit from drought-related outreach and services that are tailored to their own needs and goals.<sup>6</sup> With that recommendation in mind, we ended our interviews with a few questions about how interviewees obtain and use information that can help them cope with drought. We identified our interviewees through previous interactions with a university, the Natural Resources Conservation Service, or USDA Agricultural Research Service so they may be more likely than “the average rancher” to seek ideas from outside sources. Several of our interviewees work regularly with Extension and/or Natural Resources Conservation Service, but it appeared that the most trusted sources across the board were progressive voices within the livestock industry itself. Among the sources mentioned were *Beef* magazine, *Stockman Grass Farmer*, the American Farm Bureau Federation, and various consultants and rancher schools. No one mentioned the Society for Range Management by name, but several reported that they read scientific journals and attend conferences to learn about rangeland management, livestock production, and oil and gas issues.

Research on agricultural and natural resource information sources often shows that family and neighbors are used more frequently than formal sources.<sup>7,8</sup> All of our interviewees said they consult their neighbors, relying on wisdom from long-time successful ranchers in their areas. However, they also emphasized a desire to operate differently from their neighbors. Several pointed out that local information must be balanced against ideas from outside sources. One interviewee actively resisted the status quo, saying that he had “quit the ‘herd quitters’.” Another suggested that most of his neighbors seem to seek information about ranching “at the coffee shop.” While noting that “there’s some value in ... peer-to-peer information-sharing,” he also observed that “I kind of go with academia probably more than a lot of people.”

### Conclusions

We conducted our interviews to learn from people who are at the “front lines” of rangeland drought—those who have experienced drought and found a way to survive it. We chose to interview ranchers from three distinct locations—northeast Colorado, the southern Great Plains, and southern Utah—to see whether we could detect differences based on rangeland ecosystem, public vs. private land ranching, and the timing or intensity of the drought. Certainly those factors do influence what ranchers can do to plan for or adapt to drought, and we did find some differences across regions. But we also noticed some similarities.

Perhaps the most important of these is that our interviewees do not necessarily see drought as a specific challenge that requires specific responses. For some, drought can pose such severe challenges that it cannot really be planned for, but can only be endured through careful and creative adaptation while it is happening. For others, drought is one of a suite of challenges that regularly confronts ranchers in western US rangelands. If so, strategies to cope with drought should be strategies to cope with any challenge, and the best way to prepare is to do everything one can to improve

one's operation. They may not think of it quite this way, but their strategies embody the argument by Rhoades and colleagues<sup>3</sup> that drought is best addressed through systems thinking. The ranchers we spoke with value flexibility and are critical of institutions that reduce their flexibility. They recognize the value of income diversification, but they are not willing to embrace new income sources that could threaten other highly valued aspects of ranching.

The stories we heard from these interviews included tales of difficulty and distress, but also striking resilience. By confronting and surviving drought, these ranchers believe they have come through better off in some ways than they were before. They have learned anew of the infinite complexity of working so closely tied to nature, and they have found new ways of ranching that they believe will help them better withstand the next crisis, whether drought or something different.

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