

Livestock, Wildlife, Plants and Landscapes: Putting It All Together (Lessons from Red Canyon Ranch)

Bob Budd

Abstract

Rangeland management at Red Canyon Ranch considers: 1) landscape-scale ecological processes, 2) economics, and 3) cultural values. Inclusive collaborative planning has helped stimulate creative thinking and empowered people to try new solutions to old problems. Low stress animal handling and herding based on cattle behavior, have been used to better control stocking rates, stock densities, duration of grazing, and season of use. This, in turn, has improved wildlife habitat, increased biological diversity, and increased the health of uplands and riparian areas. Increased cattle performance and decreased production costs may also result.

Introduction

Central to discussing livestock and wildlife interactions is understanding that we can and must have compatible economic uses of natural landscapes in order to maintain ecological and human community values. That is not to say that we should not endeavor to have places which are managed for "natural" assets, or other areas which are managed for economic returns. It is possible to have all of these values within a watershed, a county, or on an individual ranch.

To develop land management strategies that will lead to sound ecology, economy, and culture, it is important to understand the landscape-scale processes that shaped the history of any given habitat or set of habitats. Areas that evolved with a history of large animal grazing, fire, and flood will lead us to different strategies than those employed in areas that may have evolved under different circumstances. It is equally important to visualize the types of animals that may have coevolved with the systems in which we now live. By doing both, it may be possible to adapt operations to the existing natural landscape, or "retrofit" our operations to a more natural setting.

Bob Budd is Director of Stewardship, Red Canyon Ranch Manager, The Nature Conservancy, Lander, Wyoming, 82520.

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Too often, the issue of livestock and wildlife is boiled down to an "either-or" proposition. This notion is then cast over millions of square miles of rangeland, as if there were no mix of livestock and wildlife compatible with biological diversity, cultural integrity, and economic security. At times, there will be situations where livestock and wildlife, or wildlife and plant communities, or wildlife and wildlife cannot be optimized. However, on a scale large enough to be valuable to diversity of species, we can usually achieve multiple objectives. However, we must first be able to accept the fact that we truly know very little about all of the "pieces and parts" of a functioning ecosystem; and that some of our "conventional wisdom" may be flawed.

Goals and Collaborative Management

In designing successful management strategies, several approaches have been used to ferret out targets and objectives to guide ranching operations. The first essential ingredient is a **common goal**, or vision, which people can understand and support. The coordinated resource management (CRM) framework, and the holistic resource management (HRM) decision-making process both work exceedingly well to achieve that objective. This may also be called integrated resource management (IRM) or another moniker, but all of these processes work in the same manner, and are based upon the same principles. Inclusion of other points of view, especially the knowledge of other people, is the basic operating premise. We engage people of different backgrounds and knowledge in order to create a group capable of acting or reacting to challenges faced in managing for a multitude of values. Members of the CRM team serve as individuals with expertise, and a common goal of managing the landscape without undue regard for jurisdictional or ownership boundaries.

Joy in Failure

To be successful, there is an immediate need for acceptance of, or better yet, excitement for, mistakes. A prime challenge we face in contemporary society is a quest for perfection, which is admirable. However, as all of us who work with natural resources and living creatures know, there is no such thing as perfection. There is elegance, wonder, incredible complexity, and

stark simplicity, and over time, infinite interactions. The time frame of natural systems may be geologic. Therefore, it is not entirely possible for us to overlay our short generational lives on the duration of an ecosystem. Attempting to overlay perfection on nature is defeating and leads to a fear of failure, which clouds our ability to think creatively. We become unwilling to be innovative and find new (or old) ways of managing. In our quest for perfection, we never leave the box. Call it paralysis by analysis - it is a serious malady. Thus, if we want to succeed, the most important commodities we can bring to resource management are an open mind, a true concern for other people's values and needs, and a willingness to fail and learn from the effort.

Dietary Overlap

It might be worthwhile to follow some of the rationale which led to our successes and failures at Red Canyon Ranch over the past five years. The first step was to understand that our natural system evolved with grazing, browsing and other natural relationships. Second we tried to ascertain how those relationships might have worked. Our working theory did not revolve around bison; but rather, bighorn sheep, elk, mule deer, and antelope. In analyzing dietary overlaps, cattle were the domestic animal that best fit the mix because they had a strong dietary similarity with elk and bighorn sheep; which were the dominant species in the landscape a few centuries ago. While it helped to consider the bison as an occasional user of the area, we viewed elk and bighorns as the primary native species in the system.

Removal of Fire

Complete removal of fire from the system shaped our current environment, leading us to wonder what the dynamics of the system might have been. It is easy to document the encroachment of conifers and juniper in the absence of fire, and the subsequent loss of aspen and other deciduous trees and shrubs. This is further substantiated by nearly unilateral agreement by community elders that "there used to be more water in the old days." These are significant changes to the natural processes that shaped our environment. Another indicator of what happened in our system is the present performance and behavior of wildlife species. Elk and whitetail populations are exploding throughout the region, while mule deer and sage grouse are declining, or at best, holding their own. Mule deer and sage grouse appear to need some level of disturbance and a lower successional level that is maintained by both grazing and fire. Consequently, plant and animal indicators pointed simultaneously to the loss of two major habitat modifiers: grazing and fire.

Entropy

Entropy is a slow process that is often difficult to observe amidst the seasonal and yearly dynamics of natural ecosystems. The complete removal of grazing can result in stark changes in standing crop; leading some to conclude that herbivory was a "problem." In riparian systems that experience chronic heavy utilization, the release following rest can be spectacular leading to a conclusion that may not be substantiated by longer term analysis. If we look at riparian systems subjected to prolonged overuse, the pattern of recovery may be unexpected. Following the initial flush or release by woody plants, many areas slowly begin losing woody plants to competition from grasses (especially smooth brome). These systems may lose the diversity once there, and regress to a community of some grasses, a few hardy woody plants, and a variety of annual or biennial plants. The coincidental loss of beaver habitat contributes mightily to slow dewatering of the system, and we find ourselves in either a degrading or stable condition we do not desire.

One of the basic premises guiding our grazing program is the need to look at the whole system, including natural processes, and ecological and cultural values. That does not imply a "natural regulation" theory; we work, live, and draw a living from a managed environment. Instead, it moves us toward a concept of sustainability. The tools we believe will lead to the desired result include management of: stocking rates, stock density, duration of grazing, season of use, type of animal, rest, and animal behavior. Each of these can be used to address the two most serious concerns relative to the long-term health of the rangeland resource; entropy and succession.

Energy Flow

By coupling our knowledge of the present landscape with the landscape our ancestors knew, we can draw a picture with less conifers and more deer, aspen, deciduous shrubs, and water. This land was also characterized by large herds of animals which were moved by predation, weather, and foraging opportunity. In the early-day cattle operations, nearly every region had extensive roundup crews moving livestock across the local landscape in response to weather and foraging opportunity. Until fifty years ago, fire may have been disdained, but was largely uncontrolled.

Seventy years ago, the Depression, followed by World War II and massive growth in technology, virtually eliminated practices and realities previously used in animal agriculture. Those changes also led to the loss of

small- to moderate-scale ranches with cooperative management of large herds of livestock. Larger size led to greater needs for technology. We were able to produce more and bigger animals through animal health aids, by producing more feed (through tillage, fertilization, pumping of water, and fire suppression), and a host of other measures, that changed our connection with the land immeasurably. Two things came out of this change. The first was a concentration of animals along privately owned riparian areas, that occurred out of convenience, as a result of regulation of the public domain, attention elsewhere, and a variety of other reasons. The second was an increase in season-long grazing on upland rangelands resulting from the cessation of roundups and riding, loss of rights to forage, attention elsewhere, and other reasons. At the same time, the size and type of livestock began to change markedly. Bigger, more docile beasts from other lands hit our shores. Predators and labor problems reduced the number and scale of sheep operations. Consequently, management options changed.

The effects of these changes were barely noticeable at first, as is the case with entropy. However, change occurred, and when people noticed, the outcry could not be denied. In the last 50 years, public opinion and action has led to reductions in the number of animals grazing on public lands, virtual elimination of natural fire, and an increase in grazing on privately owned riparian and wetland areas. Furthermore, there has been an increase in conifer encroachment, an explosion in rural homesites and habitat fragmentation. These events and activities are a very serious challenge to species we barely recognize as declining. Some of these are now cause for worry (e.g. mule deer, burrowing owls, neotropical migrant songbirds, fish, and sage grouse). It may be cavalier of me to simplify the causes, for it is not any one, but the combination of many, that have led us to our current dilemmas.

Less Is Not More

Our management approach at Red Canyon Ranch assumes that we cannot manage for landscape integrity with fewer animals, for economic reasons certainly, and possibly, for other reasons as well. In attempting to mimic natural interactions between grazing animals, wildlife habitats, and economic realities, we have to tease out some of the basic premises of the system, as follows:

1. *Animals* are a renewable source of carbon, nitrogen, and energy to natural systems.
2. Natural systems must have varying levels of disturbance, at differing scales, at different times - mid-seral is neither attainable nor the "desired" condition unless it is applied at a landscape scale.

3. All disturbances are not created equal.
4. Treatment radically different from natural disturbance will advance entropy. We should be very careful when we select stocking rates, use spring fire, herbicides, and other treatments which may radically alter the processes we are trying to mimic.
5. Disturbance need not always be followed by rest.
6. Confusion and disarray are the norm, not the exception, and should be the goal instead of being regarded as a challenge.
7. Continuous use of a treatment leads to entropy, whether it is same-season grazing, burning the same area every year, complete rest over time, or other excessive-compulsive disorders of natural resource management.
8. Short-term costs to change follow the same path as succession, with sudden response followed by longer-term trends. This is not something that will pay immediate economic or ecological returns.
9. Management which mimics or includes a natural process is the goal, even if that does not rest well with us intellectually. An example may be the notion that we should rest for two years after prescribed fire.
10. Domestic animals (including bison) are a tool which **MUST** be used to move succession, generate energy, create and maintain habitats for wildlife, and shape ecosystem function.

Human management of animals ultimately determines parameters that can be addressed. It is human creativity, that is most severely depressed at this point in time.

How Much Forage Is There?

One of the primary tenets of our management program is the notion that there is a whole lot more forage out there than we have been using. To date, I have not found many operations where that is not true. In fact, federal agencies have long characterized some ranges as "unsuitable" for grazing, based on such criteria as slope, distance from water, and cover. I am not criticizing the agencies here - the cattle they were accustomed to were largely incapable of using certain ranges; and, the practice of reducing numbers to achieve ecological objectives was so institutionalized that it became the norm. Therefore, stock density is not a tool available to alter animal behavior.

Given the general fact that the forage is there, the question becomes, how can we better use the landscape? There are several means to improve animal distribution from simple water distribution and fencing to those that capitalize on the animals themselves. At Red Canyon, our CRM group was adamant that fences were not the answer, but of primary concern because they impede migratory wildlife. A second concern was the added cost of fence maintenance and construction. Water is a constant factor, but not the only answer; again, cost is a major hurdle.

The three key elements we looked at were time (duration of grazing), timing (season of use), and stock density. By decreasing time, constantly changing season of use, and maintaining large numbers of livestock, we have seen some radical shifts in both production and forage composition. We added rest to the mix three years ago. After five years, the results are: increased animal numbers and weaning weights; full and complete rest of land (as much as 5,000 acres per year); increased hay and irrigated forage; and, reduced death loss from all causes. Keep this trendline moving upward is our objective; though only time will tell. All indications are that we can maintain these trends without substantial cost.

Animal Behavior

Absolutely critical to these changes is an understanding of the animals we use as ecological and economic tools. In working with “learned behavior,” there is none so powerful as that which is passed between humans. As humans, we hate like hell to unlearn a wrongheaded practice and replace it with another. We still speak of “breaking” horses, though few of the modern horsemen ever have a horse really buck hard beneath them. Plenty of ground time, trust, and repetition lead to a mutual “breaking” of man and horse. Cows are equally trainable. Some of the better cow trainers use a whistle to evoke the desired response. My neighbor uses a 9030 Versatile tractor for most of his cow moving and it is a very low-stress method. Unfortunately, in many of the ranges we utilize even a 9030 can’t make the trip. So, we have to train the cattle, and they us. By watching and listening to many people, we have found that we can move a lot of cattle, with a few people, MOST of the time. We expect and accept a major screw-up once a year from each of us. We *could* blame the cows, because most of our screw-ups involve cows in some way. However, one recent revelation of mine is that the more people involved in moving livestock, the better chance you will have some large-scale mess. We are pretty gentle with our cattle. We do not own a hotshot or a whip. We have about three sorting sticks, and when we work cattle, we usually don’t use those. We are

advocates of the Bud Williams schools because his techniques work. The best attestation to the fact that these techniques are valid is the use of the name “Bud Williams” as a verb. It is not uncommon to hear about “Bud Williams-ing” a heifer into the barn, or “putting a little Bud” on a group of cows.

Eat, Sleep, and Chew Your Cud

These three items pretty well sum up the life of a cow or most other grazing animals. They directly parallel the three requirements of a habitat - food, water, and shelter. Anything we do that affects one of these three requirements can shape behavior. An easy example is water development in uplands, but others include movement of animals to desirable areas at the time they desire to be there. Travis Clyde, our cattle manager, has found that to get cattle to rest and chew their cud in a certain location, he simply needs to move them there after they water, which is highly predictable. (Travis says you can set your watch by them). After they water, he moves them to a shady spot in conifers, or a ridge where the breeze will keep the bugs down. The animals will adapt to this action in about two or three days. If he chooses to move them to a new location, he moves them before watering, and lets them locate on a new water source.

The Buffet Lunch Theory

Cows never order and eat a single meal. They are constantly at the buffet line making choices; choosing differently at different times of year. As a result, we can shape the landscape by managing the time of grazing. We have begun to manage cheatgrass by grazing in early spring, with removal as soon as we begin to see the desired perennial grasses elevating. This has led to a short-term increase in western wheatgrass and needlegrasses on that range. It may or may not decrease the amount of cheatgrass, but that is a minor concern. Our goal is abundant native perennials. The same approach works well in riparian areas, where the animals are anxious to eat green grass in the spring. They are used to clean up old feed and defoliate grasses that may compete with new willow sprouts in these lush areas. By removing rapidly growing brome (until woody plants, sedges and other desirables are elevated) we are able to use the animal behavior and dietary preference to move our landscape in a direction we desire.

Race You to the *Pascopyron smithii*!

One of the most serious consequences of reducing management intensity and replacing it with reduced

livestock numbers has been the increase of animals in areas that can't withstand constant use; and, decreasing animal influence on other portions of the environment. A variety of factors enter into the result, such as opportunity cost and the conversion of native grazing lands to crops, housing and other uses. One of the most important long-term effects may be the selection of plants and habitats by grazing animals. Stock density can influence foraging behavior in two ways. First, it drives selection of the forages that will be consumed. Long-term grazing on a site allows animals to select and repeatedly select individual plants, leading to shifts in type of vegetation, and possibly, reducing plant vigor. This is shown in pastures which have long served as "spring" pastures in the shortgrass prairie. Within about 10 years, the pasture quality decreases as cool-season plants are selected by grazers, and the pasture is ultimately dominated by warm-season species of little value in a spring pasture. This is one reason that managing for biological diversity has direct positive economic implications, along with the obvious beneficial effects on natural systems.

The other influence of stock density is that at higher densities, cattle will use discreet portions of the pasture (with or without traditional range improvements such as water). As animals learn that portions of a pasture are good foraging areas, they will return to those areas, and increase the amount of forage available. The economic returns from increased numbers and availability of marginal foraging areas should offset the costs of increased management, independent of other benefits, such as reduced death loss.

Ms. Bovine, Your Child Is at the Front Register

Instead of attacking a herd of cattle in order to move them, we spend a great deal of time riding through them, opening gates in advance, and pairing them up before and after movement. Most "wrecks" occur because animals are not ready to move. We move a lot of cattle in the middle of the day or the evening, which is not the "cowboy way". However, if you watch a cow with her calf, she will step out and walk, while a mother without her calf will drag back, and eventually run back, taking most of the herd with her. This behavioral trait cannot be denied, and is even seen in human mothers in large department stores when their children have wandered off. When we reach the place we want animals to stay, they are paired before being let out of the bunch, at which time they can go freely to feed, water, or lay down. This is the Harry Day theory, and it works very well. Before long, the cows seek out their calves and are allowed to leave. By fall when we ship, more than half of the cows will be worked with their calves at their sides.

Head 'Em Up and Leave 'Em Be

We have found over time that even if we do a really great job of scaring a herd of cattle from one pasture to the next, that we will *always* have to "backride" the pasture. We also know that two or three of us can move 300 to 400 animals with ease. Planned grazing and daily monitoring of utilization (by ocular estimate) led us to moving cattle over a period of days, instead of a single gather. This practice has several benefits for us. First, it reduces the amount of labor required to move a large number of cattle. In addition, we are able to gather a portion of the pasture which may be more heavily utilized, or where we may desire more or less use. By leaving animals in areas where utilization is more difficult to achieve, we can "gain grass" while not overusing key areas or areas with different management objectives. Lastly, animals which are moving happily (paired up, not confined, and at a pace and direction they choose), will draw other animals to them. This is pure Bud Williams, and it works astoundingly well. Cattle moving freely in the general direction we want to go will get there much quicker and with less stress than animals being forced to follow a road or human route. They will often run, if given the freedom to choose their direction. It may be more important to look behind us when moving cattle than ahead so we can confirm that we are moving away from the area we want to leave, without worrying about the direction we will take to get to the next pasture.

"Vaya Con Dios", You Old Rip

I have known a few cows who were a bit cranky and I have been kicked, gored or chased by several others who were not. I have also known some cows who were poor mothers, constantly searching for their calf, and producing little milk while growing fat as sows. The reason I speak in the past tense, is that those cows have all become either someone else's problem, or burger. Landscape management being part of the goal, it only takes a handful of cows to make the process less than optimal. We call these "culls." In analyzing these cull cows some will raise a good calf on irrigated meadows, or in riparian areas, but most bring back an "average" calf. The reasons are fairly simple – a cow staying in a grazed-out area all summer is not going to produce on a par with a cow constantly on fresh forage. To the converse, the cows which produce our heaviest calves are rarely seen during the summer, unless you are riding rimrocks. This is learned behavior. Over time, the same cattle, including mothers and daughters, will forage in the same manner on the same parts of the pasture.

Why Does a Cow Dog Bark?

Travis asked this question one morning, and took me by surprise, something he likes to do. His answer was very simple – “a cow dog barks for the same reason a human being yells at cattle – they are frustrated.” This was a revelation for me, and it taught me a lot; most of all, the notion that as our yelling and the dog’s barking increases, the less chance we have of working cattle successfully. We strive to handle animals with a minimum of stress, to them and to us, and that can be directly measured in decibels. If the cattle are quiet, they will be moving. If the dogs are quiet, the cattle will be moving in the right direction. If the humans are quiet, chances are great that the other two will occur at the same time.

The Glory of Confusion

In natural systems, disturbance and confusion are the rule, not the exception. This has been captured in much of this discussion, but should be stated overtly and underscored. Our management at Red Canyon Ranch is predicated on the notion that plant communities abhor a vacuum; and in that vacuum energy, will be diminished and monocultures advanced. Grazing management should use confusion as a basis, a rule or maxim. A plant community in constant flux should armor itself in many ways, including different species’ adaptations to herbivory. Examples are numerous, in all types of systems, although response times are highly variable.

Summary

We could carry this discussion forever, and some of us will. Management of animals on rangelands is an inexact science. Much of the progress made in enhancing wildlife values, economics, biological diversity and other values of this immense resource will come as a result of shared anecdotal information between people willing to explore interactions between many of these areas. To make informed decisions, we must be open to other thoughts and ideas. We must also be aware of the economic needs of ranch managers and owners, willing to make mistakes, and constantly attentive to the history and potential of our natural systems. In the near term, there are a variety of tremendous inputs being discussed.

Some of those most captivating inputs are interrelationships between fire regime, water cycling and grazing, but there are more. Plant reproduction (through seed germination) may be overstated, leading us to consider rest in a entirely different light. Plant species competition in riparian areas may be more severe than once thought over the long-term. Theories of stable states and

energy flow should be explored. By looking back at the way natural systems have evolved under management, it is possible to make the assertion that the needed correction brought about by the Taylor Grazing Act may have done what we see most often, that is, to overcorrect and make no concession for management. All of these topics could occupy the next conference, and will take up great amounts of time. However, the one real truth we should remember is that we will need animals to act appropriately, and an understanding of their behavior will be essential to choosing the proper action.