

Arapaho Ranch

Carbon Sequestration Case Study

Overview

The Arapaho Ranch is a unique enterprise in the United States that actively embraces and markets its place at the intersection of ranching, ecology and economics. The 595,000-acre ranch with headquarters in Thermopolis, Wyoming is owned by the Northern Arapaho Tribe and is one of the few commercial tribal cattle operations in the country. It is part of the 2 million acre Wind River Indian Reservation established by the Fort Bridger Treaty of 1868.



Fast Facts

Land owner: Northern Arapaho Tribe
Ranch manager: David Stoner
Location: Thermopolis, Wyoming
Land Resource Region: Rocky Mountain
Size: 595,000
Acres enrolled: 230,000
Project type: Rangeland soil carbon offset
Year enrolled: 2009
Length of contract: 5 years
Registry: Chicago Climate Exchange (CCX)
Aggregator: Beartooth Capital Partners
Verifier: SES Incorporated
Carbon credits sold to date: none
Year of Sale: N/A
Total sales to date: N/A
Trading platform used for sale: N/A

David Stoner, the current ranch manager, is an enthusiastic envoy of the Tribe's philosophy of a long-term, sustainable approach to land management and is himself an avid proponent of grass finished cattle as a less resource intensive and healthier model for beef production. The Arapaho Ranch is becoming well known for its holistic approach to range management and is establishing a market niche for itself in certified organic beef in the western US.

The ranch's enrollment in the carbon sequestration program is relatively recent and is viewed as just one aspect of their approach to good stewardship.

Soil Carbon Sequestration Project

Why they enrolled

Stoner first heard about the opportunity for soil carbon offsets from a mutual colleague who was working with Beartooth Capital, an aggregator for the National Carbon Offset Coalition (for a concise description of the voluntary carbon market as it relates to rangelands, please see Appendix 1). The idea of participating in a program focused on climate mitigation fit with the Tribe's and with Stoner's philosophy of stewardship, though Stoner believes that carbon sequestration activities alone will not be enough to meaningfully impact the climate change problem.

"[The Arapaho] truly believe in trying to live in harmony with nature and with them it is authentic. ... We probably have a lot to learn but I think based on what I've seen on other ranches ... things are pretty healthy here. The riparian areas are well managed. The wildlife species here are abundant and very healthy. It's just very important to us..."

- David Stoner, Arapaho Ranch manager

"The motivation was money"
- David Stoner

The motivation to enroll was the potential financial opportunity, despite carbon credits trading at a very low price when they began the process. It is seen as something that may yield a financial return and as

such, is a chance to get paid for something they are already doing.

Rangeland soil carbon project

Enrolling in the program was straightforward given the detailed documentation already required of the Arapaho Ranch to maintain their organic beef certification with the USDA (the ranch was certified organic by International Certification Services, Inc. on January 19, 2008). Information was also available from the ranch's 2001 integrated natural resources management plan and from the range inventory recently completed by the Natural Resources Conservation Service (NRCS) as part of the ranch's enrollment in the Conservation Security Program. The ranch also has a database of GIS maps, which expedited much of the verification process. According to Stoner, the verifier was able to download maps of the audited sites directly into the database for inclusion in the data package being sent to the Chicago Climate Exchange (CCX) Technical Committee for review and approval.

The process led them to enroll 250,000 of the ranch's 595,000 acres in the CCX carbon offsets program. Though the ranch's management strategies easily dovetailed with the CCX protocol, over 300,000 acres (located in Fremont County) did not qualify because it fell outside an acceptable precipitation zone. All of the land in Hot Springs County (an approved zone) was enrolled, except small parcels of steep, heavily timbered areas located in the Owl Creek Mountains.

Outcomes

The project enrolled 250,000 acres in 2009. There were no acres backdated under the CCX 'restoration of degraded rangeland' status, which was terminated at the end of 2008.

From the audit, it was made clear that all of the grazed lands of the Arapaho Ranch would easily qualify for enrollment in the carbon credit program of the CCX. Arapaho's credits were enrolled at a carbon sequestration rate of 0.12 metric tons/acre/year, thus the ranch is purportedly sequestering approximately 26,475 metric tons of CO₂ emissions a year. The Tribe has no immediate plans to sell their credits, especially given the current low price of carbon.

Range Management Practices

When Stoner was hired in 2001, the Arapaho enterprise was suffering from the effects of a large fire that had burned over a quarter of the ranch, several years of drought and from the consequences of having had 20 managers in 20 years. After significantly reducing the stocking rate from approximately 90,000 animal unit months (AUMs) (based on a 1962 range inventory) to 68,000 AUMs, and eliminating the stocker component of the operation, Stoner began rebuilding the natural resources of the rangeland and creating a system that is "more about grass management than cattle management."

For many years, Stoner had been interested in putting together a grass-fed or grass finished cattle program, convinced that the relationship between ruminants, grass and humans can be a sustainable one: native grassland ecosystems thrive under low impact grazing and cattle are designed to break down the cellulose and convert it to edible proteins for humans. Stoner's view is that a balanced grass system requires neither high inputs (fertilizer, herbicides and fuel and equipment costs) associated with grain production, nor the high fuel costs of transporting grain and cattle to feedlots. Grass-fed production is a more direct ranch-to-consumer program. His proposal was embraced by the Arapaho Tribal Business Council as one that fit extremely well with their land and stewardship ethic as well as with their traditional diet of naturally grazed animals.

"But the whole ecosystem, the whole native grass system is uniquely designed to be grazed ... so it's a really wonderful system in place. Why would we want to mess it up by taking these perfectly healthy animals off of a thriving system that their systems are designed to utilize and put them in a confined area and feed them high concentrated diets of grain that they're not designed to utilize, and their systems don't handle that well?" – David Stoner

Stoner transitioned the management approach from rotational (pasture) grazing to deferred grazing (which imitates the movement of wildlife to areas of use based on seasonal and *actual* growth of grasses and forbs); and took out fencing, leaving only a few irrigated pastures used to wean calves, confine cows that needed to be tested for pregnancy, and gather animals prior to shipping to slaughter. The rest of the rangeland, as Stoner describes it "is all wide open."

The approach has worked well – Arapaho supplies to Panorama Meat which in turn supplies the high profile natural foods store Whole Foods – but there are significant challenges to producing for a small scale, specialty market, not the least of which is competing with the conventional beef industry. Without the use of herbicides, pesticides,

chemical fertilizers, growth hormones and antibiotics - and without grain finishing cattle in a feedlot - the grass-fed approach takes more time and consequently, more acres per cow. And, currently, the business model of selling a limited supply to a very small market means higher processing and distribution costs that must be made up on the price of the product. Any changes to the cost and price structure of grass-fed or organic beef, Stoner observes, will need to be driven, first and foremost, by higher consumer demand.

Along those lines, Stoner asserts that most agricultural products – including, most recently, sequestered carbon – develop only after there has been a proven demand for them. The risks and opportunity costs are too high for farmers and ranchers to develop a product or service without there being an established market for it. And his experience has been that the traditional financial institutions and instruments are not conditioned to support new or innovative ventures. Without capital to pay for the infrastructure or expertise, most ranches face strong financial barriers to making major changes in their operation.

"A rule of thumb in Range Management 101 is 'take half and leave half'. Where did that rule come from? That has no application in the real world. It's so arbitrary as to be utterly ridiculous." - David Stoner

In general, the range management practices required for sequestering soil carbon are already well in place on the Arapaho Ranch even if they do not necessarily follow the standard approach to rotational grazing endorsed by the NRCS and included as the CCX rangeland protocol until September 2009. Stoner figures that the utilization across the range is less than 20 percent (much lower than the conventional 50 percent), allowing most of the grass plants to reach full

maturity. According to Stoner, intensive rotational grazing works well on fairly flat land with a few species of grass, like in Kansas and Nebraska, where cattle are moved from pasture to pasture frequently and those heavily grazed grasses have a chance to recover. In the Intermountain West, however, with its more varied topography, fencing is difficult to maintain and is frequently placed at the top or bottom of steep slopes, with the result that cattle are discouraged from grazing those lands.

The Arapaho Ranch is home to 5 or 6 native species of grass that grow, mature and go to seed at different times. By implementing a more dispersed pattern of grazing, Stoner has found the cattle now access all the available grazing land including those steeper slopes. This promotes the health of the grassland ecosystem by allowing the perennial plants to fully regenerate from both the root and the seed.

Is It Worth It?

While Stoner is firm in his belief that carbon offsets are not a solution to the climate change problem, he does see them as a good opportunity for ranchers to be more involved in understanding the potential impacts and benefits of their specific management practices. Rather than having the "NRCS or the BLM or some other agency doing the monitoring, the ranchers themselves, the land owners – the people that have a vested

interest in the land – need to be doing the monitoring, need to be really carefully watching what is going on in the land.”

Challenges/Barriers: Stoner experienced some confusion and frustration with the enrollment criteria for lands. The protocol requires that eligible land have cattle actively grazing it; yet a significant portion of Arapaho’s acres were resting during the verification period – a situation not clearly covered under the CCX rangeland protocol. To Stoner, it appears that the CCX protocol addresses cattle management more than carbon management.

Another issue for carbon sequestration in the Intermountain West region is that many ranchers use public lands for grazing and these are ineligible for enrollment in the program. Stoner believes that if ranchers are investing time and effort managing cattle on that grazing allotment, then being able to register carbon credits generated on that land could act as an incentive to continue with or switch to better range management practices. The standard arguments against including public lands in carbon sequestration programs are that there would be strong resistance to paying ranchers to manage public lands in an ecologically sustainable way (i.e. “Shouldn’t that be happening anyway?”) and that the number of carbon credits that could be generated off public lands is potentially large enough to glut the market and drive down the per ton price of carbon even more.

Stoner, however, points out that the patchwork nature of the layout of private and BLM lands often makes it difficult to differentiate them and their different treatment would have to be addressed somehow, possibly by fencing off the BLM land. Alternatively, the BLM could provide some other incentive to encourage best management practices, such as reducing the AUM charges to operators if they voluntarily reduce the stocking rate on those lands.

Finally, Stoner believes that the carbon sequestration issue needs to be promoted at the state level, perhaps more so than at the national level. He thinks that there is strong potential for ranchers to engage more in the kind of practices needed for good land stewardship and carbon sequestration, but they need the institutional support and technical assistance that could be accessed through the NRCS and/or university extension offices.

Financial incentives for carbon sequestration will certainly be a strong motivation; but, Stoner surmises, information and guidance on better range conservation to facilitate the enrollment process might make the opportunity (and the necessary transition to new management practices) even more attractive.

“I think there are a lot of ranchers out there who want the help, they just don’t know where to get it.” – David Stoner

Future Outlook

The Arapaho Ranch is an interesting study regarding the relationship between good land stewardship and the implementation of the current CCX range protocol. The Arapaho Ranch appears to be a model of the ways in which sustainable rangeland management

and economic diversification, including profitable niche marketing and payment for ecosystem services (PES), can go hand and hand. It may be, however, that the PES market is not yet able to reward operations like the Arapaho for the “services” it is capable of providing, given, for example, that existing eligibility requirements for CCX mean that much of Arapaho’s land is not allowed to be enrolled.

The Arapaho Ranch case, along with a few others, suggests that the CCX protocol is not nuanced enough to capture the ecological variability of managed grasslands; nor does it recognize and reward the more innovative management strategies utilized by some ranchers. As Todd Graham, an aggregator for the National Carbon Offset Coalition who has worked with several innovative ranches asserts, “Some places like the Padlock, or Arapaho Ranch...they’re clearly way out in the lead. The market structure today and the protocol today cannot reward them for that work. It can’t do it. How do we find ways? Well, take the Arapaho Ranch - 600,000 acres, contiguous. How do we measure the amount of soil carbon they’re sequestering and reward them for that? That’s what we need to be doing. That’s what they should be selling.”

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Appendix 1. Rangeland Carbon Offset Basics

Currently within the United States, the mechanisms for buying and selling carbon sequestration offsets are strictly through the voluntary market. The Chicago Climate Exchange (CCX) is the only legally binding system for trading emission sources and offset projects, although many carbon credits (each representing the reduction of one metric ton of carbon dioxide emissions) are bought and sold directly, usually through a private broker, as “over-the-counter” (OTC) transactions. Regardless of the mechanism for exchange, carbon credits are generally associated with some type of standard or protocol that verifies the amount of carbon sequestered by a given project.

Carbon credits sold on the CCX are generic, since they can come from either forestry, methane capture, renewable energy or agriculture and rangeland soil carbon projects. Over the past year, prices for these generic credits have ranged from over \$7/ton in May 2008 down to their current price of \$0.10/ton (www.chicagoclimatex.com as of April 5, 2010). Prices for CCX credits sold OTC are generally higher, since they are traceable to a specific offset project.

At present, the CCX is the only organization with a protocol for carbon offsets from rangelands. Led by a Technical Review Team of soil scientists, the CCX developed their Rangeland Soil Carbon Offset protocol in 2007. Landowner participation in the program requires a long term (minimum of 5 years) “legally binding commitment to defined management practices which increase soil carbon stocks on rangelands” (CCX 2009). Most landowners in the Midwest and West work with an aggregator, allowing them to be part of a pool of carbon credits from multiple properties. These aggregators (e.g. North Dakota Farmers Union, National Carbon Offset Coalition) guide landowners through the process of engaging in the carbon market.

The protocol uses Land Resource Regions, defined by the National Cooperative Soil Survey, as a geographic basis for issuance rates for below ground carbon sequestration and outlines a list of eligible practices to increase carbon sequestration (e.g. prescribed grazing schedules, ensuring sustainable forage for livestock and wildlife, contingency management plan for drought conditions) that must be documented in a range management plan. Practices must be voluntary, and above and beyond “business-as-usual” (CCX 2009).

To enroll, projects must be reviewed by a third party verifier to ensure they meet the eligibility criteria and that they “adopt and demonstrate conformance with a formal grazing plan” which, at a minimum...meets or exceeds the Natural Resource Conservation Service standard” for Best Management Practices (CCX 2009). With aggregated pools, only a random sample of 10 percent of the ranches in the pool are selected for in-field verification, though all ranches over 30,000 acres must be field verified during the first year. A Verification Report is submitted to the CCX for approval and landowners have the option to register their credits for sale through the CCX, for which they are charged a \$0.15/credit registration fee, or they can sell them OTC.

The first iterations of the protocol included several provisions designed to encourage early participants in a fledgling market, such as 1) the ability to “back date” acres, allowing landowners to receive credit for “pre-compliance” with the protocol by enrolling rangeland managed using eligible practices initiated on or after January 1, 1999; and 2) the ability to enroll acres with “degraded status” which qualified for a higher carbon sequestration crediting rate. Both of these were eliminated in 2009, as they had served their purpose of attracting early actors to the carbon market; and the degraded status option posed the risk of creating perverse incentives to purposely degrade land and enroll it under that status in order to qualify for higher payments.