

# Rural Economic Development Opportunities in New Mexico

## Innovative & Profitable Ranching



HOLISTIC MANAGEMENT INTERNATIONAL  
& THORNBURG FOUNDATION  
4/29/2014

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# Executive Summary

A changing industry and current drought conditions have affected ranchers across the state and continue to threaten our state's agricultural economy and natural heritage. We need land management practices that increase rangeland productivity, reduce water loss from our soils and ensure healthy profits. New Mexico policy makers can help by creating incentive programs to motivate ranchers to adopt ranching practices that result in a more viable ranching industry for New Mexico.

## The Problem

New Mexico has been suffering from less than average precipitation since the late 1990's and extreme drought conditions for the past 4 years. During that time, the state has seen cattle herds drop from 1.5 million in 2009, to a low of 500,000 in mid-2013\*. A shortage of forage on grazing lands throughout the state has forced many ranchers to purchase more supplemental feed and/or reduce their stocking rates, with some having to liquidate their herds.

Cash receipts for livestock sales are also down, falling \$1 million from 2011 to 2012.\* With cattle and calf sales providing an average of 37% of the state's total agricultural cash receipts,\* it's in all our best interest to provide New Mexico ranchers with a way to minimize the effects of the drought and decrease input costs on cattle operations throughout the state.

## The Solution

While it is challenging to manage during drought, it can be done. Good management practices can result in more resilient landscapes and ranching businesses. The key is to plan for extreme conditions and be ready in advance with fallback plans that minimize risk. Producers who have advance planning are most resilient to the effects of drought. Research shows that the following ranch practices are essential:

- Adaptive grazing planning that responds to changing forage production
- Short duration grazing with adequate plant recovery periods for drought conditions
- Using livestock to improve land health through effective herd management
- Road and riparian management practices that retain water on the land
- Marketing to local markets

Other states have developed incentives and models for improved performance on agricultural lands. New Mexico has the opportunity to develop a variety of financial incentive programs to improve management practices on our lands, increase our resilience to drought, and stimulate local economies.

**This document offers research and case studies on healthy and profitable management practices which might well be the basis for policies and programs New Mexico could implement to offer incentives for ranchers to adopt ranching practices that can create a more robust ranching industry.**

*\*New Mexico Agricultural Statistics, New Mexico Department of Agriculture*

# Healthy & Profitable Land Management Practices

The following case studies are examples of the results innovative ranchers from around the Southwest have experienced by improving the rangeland and profitability of their ranches.

## Case Studies from the Western US

- JX Ranch, New Mexico
- Ranney Ranch, New Mexico
- Carrizo Valley Ranch, New Mexico
- Birdwell & Clark Ranch, Texas
- Ford Ranch, Texas
- 77 Ranch, Texas



*Ranney Ranch, Corona, New Mexico, August 2013*

## Tom & Mimi Sidwell JX Ranch, New Mexico

*Excerpted from an article by Courtney White, originally published in Acres USA*

In 2004, Tom and Mimi Sidwell purchased the 7,000-acre JX Ranch, south of Tucumcari, New Mexico and set about doing what they know best: earning a profit by restoring the land to health and stewarding it sustainably. As with many ranches in the arid Southwest, the JX had been hard used. The land's health had been depleted by substandard cattle, farming, and water management. Grass cover had diminished in quantity and quality, exposing soil to the erosive effects of wind, rain, and sunlight, which also diminished the organic content of the soil significantly. Profits fell too for previous owners. Many had followed a typical business plan: stretch the land's ecological capacity to the breaking point, then add more cattle when the economic times turned tough, and pray for rain. In the case of the JX, overgrazing caused mesquite shrubs to out-compete perennial grass plants, which increased the amount of bare soil across the ranch, which encouraged wind and water erosion, which dropped water tables as gullies grew and deepened and topsoil blew away. Water, nutrient, mineral, and energy cycles and profits unraveled across the JX Ranch.



This did not deter the Sidwells because their business model was holistic and integrated—they look at every part of their property as interconnected. Their goal was to increase the capacity of the ranch at all levels.

**Grazing Planning** results in vigorous grass plants with strong root systems that respond quickly to rainfall (left) vs. grass that has been continuously grazed (right) (Sept., 2013)



Tom began by dividing the entire ranch into sixteen pastures, up from the original five, using solar-powered electric fencing. After installing a water system to feed all sixteen pastures, he picked cattle that could do well in dry country, grouped them into one herd and set about carefully rotating them through the pastures, never grazing one for very long (7-10 days typically) in order to give the land plenty of recovery time to grow grass. Next, he began clearing out the juniper trees on the ranch with a bulldozer. Eventually he turned his attention to the mesquite as

well, grubbing out hundreds of acres so that native grass could grow in its stead. It worked. Tom knows how to read a landscape, and what he began to see on the JX was land beginning to heal.

Tom kept going. He began to feed the cattle on patches of bare soil and on gully headcuts. Soon he was able to lengthen the period of rest between pulses of cattle grazing in each pasture from 60 days to 90 days to the current 105 days. **This allowed the Sidwells to increase the overall livestock capacity of the ranch by 25% in only six years**, which has had a significant positive impact on their bank account. The typical stocking rate in this part of New Mexico is one cow to 50 acres. The Sidwells have brought it down to one to 36 acres, and hope to get it down to 1 to 30 acres someday. The reason for his optimism is simple: **the native grasses are coming back, even in dry years.**

**Grazing planning help arroyo channels to narrow and slopes to revegetate(2005 on left and 2013 on right).**



In 2011, JX Ranch has seen a little more than three inches of rain in twelve months (the average is ten inches). Rather than sell his cattle, however, as many ranchers in nearby Texas have done, Tom built fences—the JX now has 25 pastures, each with an average grazing period of 4 days followed by 105 days of rest. Tom reports that **the ranch has “plenty of grass for the cattle even with a 28% increase in carrying capacity.**

In 2009, the Sidwells converted their beef business from a conventional, feedlot-based system to an entirely grass-fed operation. The benefit: profitability. **As an added-value food, grass-fed meat sells for as much as 50% more than conventional meat.** The Sidwells also run a small tourism business on the JX—customers pay to stay in a pretty guest house on the property and help around the ranch.

The Sidwells can do all these things on one ranch because they have reconnected soil, water, plants, sunlight, food and profit in a way that is both healing and sustainable. They did it by returning to nature’s principles of herbivory, ecological disturbance, soil formation, microbial action, and good food. In the process, they improved the resilience of the land and their business for whatever shock or surprise the future may have in store. They made the land sing, in other words, with health and life.



## Nancy Ranney & Melvin Johnson Ranney Ranch, New Mexico

Excerpted from "The Interplay of Range Management, Grassfed Beef, Wind, and Biomass", originally published in "In Practice".

The Ranney Ranch was created when George and Nancy Ranney bought two adjoining ranches near Corona in 1968. By 1983 when current manager, Melvin Johnson came aboard, the ranch had an established Angus/black baldy cow-calf operation concentrating on production weights, pushing high stocking rates and practicing continuous grazing on 19 pastures.



In 2002 the ranch passed to the next generation and new management practices were introduced. The first step was to implement a **planned grazing program** where pastures are grazed at most twice a year for short timeframes.

In 2003, under the guidance of Kirk Gadzia, Resource Management Services, the ranch developed growing and dormant season grazing plans, bringing the 19 herds of cattle first into two herds and then into one. This has worked. **Feed costs are down by 60%, even during recent drought years.** No longer do they need so many bulls, a huge investment, since the cows are all in one herd; they are now down to 6 bulls, from 28 in 2002.

**Fuel costs of checking on one herd are lower.** Mostly, they need only open gates to move the herd and in the fall, they can gather the herd in a morning, when three or four weeks were previously needed.

The most astounding improvement is in the health of the rangeland. Where once the ranch had a blue grama monoculture, now the ranch sees the benefits of a biologically diverse plant community. The grazing season is extended with many cool season grasses not present previously; legumes and even recently a sedge have been documented. Within three years, they saw **an increase in organic matter in the soils and counted over 45 species of native perennial grasses.** This is good, both for cows and wildlife and for the retention of water on the range.

Analyses in 2008 demonstrated that silt & clay soils from **pastures under planned grazing exhibited 25% higher levels of soil carbon than pastures with traditional set stocking practices, thus making soils able to hold millions of additional gallons of water.**

At the same time that the ranch implemented planned grazing, they increased efforts to manage rainfall on the land. They learned the importance of runoff management, proper road construction and

"water harvesting techniques" and how the "rolling dip" spreads water back onto the landscape. (In 2013, 14 miles of rolling dips



*Fenceline Comparison with Neighbors, September 2013*

were installed; **a conservative estimate is that this retains a minimum of 10 million gallons of water on the land that otherwise would have been channelized by roads and gullies off the ranch.**)

The ranch sold its first grassfed animals in the fall of 2003 to a few happy customers. The word was out about potential health and environmental benefits. The Ranney family were intrigued by the idea of growing a healthy product and marketing directly to consumers, and opted to market calves right off their mothers at weaning and sidestep the challenge of finishing. Initially they sold to family and friends; now most customers find them via the website or by word of mouth. **Over 75% of their customers are local to New Mexico**, and they process their beef at Fort Sumner Processing, a small family-run processor in Fort Sumner, NM and are approved by the American Grassfed Association (AGA) and Animal Welfare Approved (AWA).



*Clearing invasive juniper & reclaimed meadow (foreground) in contrast to neighbor's land in background.*

The picture was starting to come together. The reduced feed, fuel and labor costs of the new grazing program worked together with the premium from direct-marketing grassfed calves on the hoof. **(Net profit per calf has averaged 70% over sale barn calves.)** The ranch has started to reduce its external inputs, become part of a local economy, and relied more on the native resources of the ranch itself. In addition, the family has participated in local alternative energy and biomass exploration.

Of course, all has not been rosy. Severe drought since 1999 has forced the ranch to keep its herd numbers down and the time and energy required of a direct marketing program still challenge the sustainability of such an operation.

More recently, it is clear that planned grazing has allowed the ranch to weather the past three years of extreme drought with greater resilience than many surrounding ranches and that with one season of good precipitation **in 2013, ranch rangelands made a remarkable recovery, producing the best stands of grass and the heaviest calves in their recent history.**

The Ranney Ranch takes hope in the fact that they are working with native resources and that the lowest technological fixes are the ones that are giving them the fastest and best return. They continue to look for ways to live in partnership with the land.



*Resurgence of new grass - even after drought, September 2013*

## Sid and Cheryl Goodloe Carrizo Valley Ranch, Capitan, New Mexico

Sid and Cheryl Goodloe began implementing what was to become Holistic Planned Grazing in the late 1960s. After learning about the technique in Africa, Sid returned to Carrizo Valley Ranch in 1969 and began to divide paddocks, not using the cell approach, but by topography and water availability, and began noticing a general improvement in range condition and biodiversity.



Sid's primary goal was to grow as much grass as the rain would allow and control erosion. This led to the realization that there were too many invading trees that were not only suppressing grass growth, but causing sheet and gully erosion. It has taken 50 years to achieve that objective or goal and now **the Goodloes are able to keep much of the rain that falls on the ranch—on the ranch!**

To be good land stewards, Sid has found that it requires at least five principles:

1. Know the history and climax condition of your ecosystems
2. Manage that ecosystem in a holistic manner – taking into consideration all parts as you plan for a profitable enterprise (i.e., livestock, wildlife, aesthetics and recreation)
3. Move animals—*avoid continuous grazing*
4. Monitor your land use and be flexible enough to change direction and re-plan
5. Share your experience with others

The Goodloes have used a wide variety of vegetation manipulation methods to accomplish their landscape goal and sustain what they want to produce. They have included: chaining; dozing and piling; seeding; fire; hand grubbing; and herbicide. Their philosophy is to defer the riparian area during the growing season and flash graze during the dormant season. **A lush riparian zone is also attractive to all forms of wildlife, and when combining that with uplands in near climax condition, fee hunting becomes a major player in the overall profitability of the ranch.**



Riparian Area Comparison. 1958 on left. 1998 on right.

## Deborah Clark Birdwell & Clark Ranch, Texas

Deborah's husband Emry Birdwell is a third generation rancher who first learned about whole ranch practices around the same time he married Deborah. Emry worked leased land while Deborah pursued a career outside of ranching. In 2004, Deborah joined Emry in the ranching business when they purchased a 14,000 acre ranch to pursue their vision of a profitable and diverse business enterprise.



While Emry was well versed in ranching and holistic planned grazing, Deborah was eager to learn as well, so she took a class from HMI. Together Emry and Deborah have transformed their new ranch. The ranch had previously been managed conventionally. "It had the common wear patterns you see with a continuous grazing operation, with clear bottoms and lacking in grass," says Deborah. They began running three herds of 1500 – 2000 steers each. "We make decisions based on the grass and adjust our stocking rates based on those conditions." Their decision making skills have certainly been put to the test in the last couple of years. In 2011 drought hit their region hard. "We sold one herd and the drought forced us to combine the remaining two herds into one. We were a little fearful of that," says Deborah. But it worked out well for them. As Deborah says, "It's been remarkable. We are in our third year of drought and we've had our best financial year ever. We continue to run one herd moving them 4 – 6 times a day in the prime growing season. **We've increased our gain from 250 lbs per head before the drought to 300lbs after.** Our per-acre gain is also better than the county average which is 40-60 lbs per-acre. Ours runs around 100-110 lbs." Because of the increased gain and more diverse forage, they are able to take their animals off earlier in the season and reserve more forage for the fall.



## Forrest Armke & Sons Ford Ranch, Texas

Forrest was raised in an agricultural family. His dad was a farmer; his uncle, a rancher. Unfortunately, while farming in the mid 1960's, Forrest was poisoned by DDT and stopped farming—fearing further chemical exposure. But he missed the agricultural life and eventually turned to ranching, working at several ranches through the years, practicing conventional ranching techniques. “Back then, you could park a truck and never cover a blade of grass,” says Forrest.

In the late 1980's, Forrest began working at the Ford Ranch, which is managed under a charity trust. By law, the ranch must produce profits or risk being sold off. But the Ford Ranch was struggling “There wasn't enough forage to create the income we needed. We had to do something,” says Forrest. It was around that time that Forrest heard of Holistic Management, but he was skeptical. “There's no way that's going to work here,” he thought to himself. But after seeing how well it worked on the land, he began Holistic Management training. “I was hungry and my mind was wide open.” From that point forward, Forrest and his family have been avid Holistic Management practitioners.



Forrest practices planned grazing, which has brought enormous benefits for his herd, the land, and the bottom line. **“Before practicing Holistic Management, our calves were about 350 pounds and now they are routinely 700 pounds.”** The increased forage on his land has been a contributing factor to their growth. “Our land is so much healthier now. We are seeing plants growing that haven't been seen since the 1930's. **Our water stock ponds aren't as full after a rain because more moisture is being held in the soil, close to the roots and not running off.**”

**The ability to retain more moisture in the soil has really benefited Forrest recently, as his region has been seriously affected by drought.** “While I did have to move about half of my herd out of state, I had enough forage to keep half the herd here on the ranch. Many of my neighbors sold every head they had, supplemented heavily with hay or moved the entire herd out of state.”

Forrest has also seen a tremendous growth in wildlife on the ranch. The hoof action and the fertilizer from the cattle help to restore the land for wildlife. When the cattle are rotated out, they leave nesting grounds and habitat for doves, quail, and white tail deer, among other species.

“Holistic Management is about getting nature to do the work for you,” says Forrest. This understanding has allowed him to cut back on farm expenses. **It used to take 12 men on horseback to move 500 cows and now it takes two men on 4-wheelers.** Understanding how nature works has also allowed him to reduce field flies and ticks by adding sulfur to the cow's mineral diets and by not allowing hunters to field dress outdoors. Years of holistic grazing has increased beneficial bugs to his land as well, with dung beetles making quick work of cow patties – driving the nutrients into the soil while Coachella bugs are reducing prickly pears.

Forrest, his wife, and two sons work the ranch as a team. Everyone has input into plans, they know what their goal is, what they need to do, and together they plan and replan for the future.

## Gary & Sue Price 77 Ranch, Texas

Excerpted from "Improved Water Quality as a Crop by Heather Smith Thomas" originally published in "In Practice".

Planned grazing and flexibility became a way of life for Gary Price more than 30 years ago on his ranch. This land where cattle now graze was once farming country, growing cotton. He's worked to create a landscape that will harvest water that over time may be the most valuable crop he sells. **Combining a focus on healthy land with a flexible approach to raising and selling cattle and diversifying income streams has resulted in a successful business model for the ranch.**



"We bought some parcels that were severely overgrazed. Just by keeping cattle off and giving them a little rest, we found there was a pretty good seed source and some native species coming back in. One portion was not particularly overgrazed, but had been continuously grazed for a long time. We rested it because we saw it had a lot of Big Bluestem and now it has more Big Blue than any other pasture we have. When we bought it, however, the grass was very short and it was hard to identify," says Gary.

"I am a big believer in paying attention to cow behavior. They need to have something out there to eat, but they can be pretty industrious and find things to eat if we just press them a little bit and let them know we are not going to spoil and pamper them. We don't want them eating any noxious weeds, but that won't happen if we have enough plant diversity. They will find something nutritious," he says.



*Planned grazing has helped tall grass return to the land.*

"We had very little rain during the last 3 months. Over a 60-day period we had only 3/4 inch of rain, and the temperature was over 100 degrees most days. It was extremely dry. To get through those periods you need to have some grass stockpiled. You also have to be ready for the rain. We recently got 3 inches, and we will benefit from that. **Many producers, sadly, have already grazed off everything they have and are feeding hay—starting in August.** The water will run off that land if there is any slope at all, and not much will sink in," says Gary.



*77 Ranch has increased grass species diversity including this stand of Indian Ricegrass*

Until we see some changes in the weather we are trying to be as flexible as we can, with light stocking rates. **The last 2 years have been a bit crazy because even though the drought has been severe we haven't fed any hay or cake or supplemental feed.** We've had mild winters, and a little rain in the fall which gave us some growth on the cool season plants. The cattle were able to graze through the winter," says Gary.

# Research

## AgriLife Research:

### Multi-paddock grazing is superior to continuous grazing

The following article is a distillation of research performed by Dr. Richard Teague of Texas Agrilife and notes critical ranch management practices. Research shows that healthy rangelands are considerably more productive, stable, and resilient than those in poor condition. Ranch livelihoods depend on healthy rangeland. More information on this research can be found in the appendix.

VERNON – A long-term study verifies multi-paddock grazing improves vegetation, soil health and animal production relative to continuous grazing in large-scale ranches, according to Texas AgriLife Research scientists.

The study measured the impacts on vegetation and soils achieved by commercial ranchers who adapted management practices in response to changing circumstances to achieve desirable outcomes, said Dr. Richard Teague, AgriLife Research rangeland ecology and management scientist in Vernon.

At the ranch scale, when multi-paddock grazing is managed to give best vegetation and animal performance, it is superior to continuous grazing in relation to conservation and restoration of resources, provision of ecosystem goods and services, and ranch profitability, he said.

Teague said this study differed from those conducted by researchers who investigated multi-paddock grazing in relatively small experimental areas, without managing adaptively the way a successful, conservation-oriented commercial rancher would.

This is tall grass prairie under multi-paddock grazing at the same high stocking rate, but dominated by highly productive grasses with few weeds, according to Dr. Richard Teague, Texas AgriLife Research-Vernon. (Texas AgriLife Research photo by Dr. Richard Teague)



In rangeland ecosystems, maintaining normal soil and ecosystem function over the landscape and watershed is possible only if there is adequate plant cover and species composition to provide protection from soil loss, he said. This allows microorganisms to prosper and maintain ecosystem functions such as water-holding capacity, control of erosion, soil fertility and forage production, he said.

"In our study we examined the accumulated impacts of nine years of different grazing management categories on vegetation and soil parameters at a commercial-ranch scale," he said.

The study evaluated the impact of multi-paddock grazing at a high stocking rate compared to light continuous and heavy continuous grazing on neighboring commercial ranches in three proximate counties in North Texas tall grass prairie. The same management had been conducted on all ranches for at least the previous nine years.

Multi-paddock grazing was managed using light to moderate defoliation during the growing season followed by adequate time to recover, Teague said.

With multi-paddock grazing and ungrazed areas, the vegetation was dominated by taller more productive grasses. With heavy continuous grazing, it was dominated by less productive short grasses and forbs, he said. Light continuous grazing had a lower proportion of tall grass species than multi-paddock grazing or ungrazed areas.

Teague said there was more bare ground on heavy continuous than light continuous, multi-paddock and ungrazed areas, while soil aggregate stability was higher with multi-paddock than heavy continuous grazing, but not light continuous grazing and ungrazed areas.

Soil compaction was lowest with multi-paddock grazing and ungrazed areas and highest with heavy continuous grazing, he said.

Water infiltration rate did not differ between grazing management categories, but soil erosion was higher with heavy continuous grazing as compared to other grazing management categories, Teague said. Soil organic matter, water holding and fertility were higher with multi-paddock grazing and ungrazed areas than both light continuous and heavy continuous grazing.

The fungal/bacterial ratio was highest with multi-paddock grazing as a result of the greater amounts of tall grass species, he said, indicating superior water-holding capacity and nutrient availability and retention for multi-paddock grazing.

“This study documents the positive results for long-term maintenance of resources and economic viability by ranchers who use adaptive management and multi-paddock grazing relative to those who practice continuous season-long stocking,” he said.

The general management on the ranches using multiple paddocks per herd was to graze a pasture lightly to moderately for one or three days, followed by a recovery period of approximately 30-50 days and 60-90 days during fast and slow growing conditions, respectively.

This resulted in two light-to-moderate defoliations during the growing season with regrowth before the majority of plants switched from vegetative to reproductive phases, Teague said. This kept the plants in a leafy, vegetative



condition during the growing season to provide a high level of forage quality for the livestock and to ensure the best possible forage regrowth after defoliation.

During drought periods, animal numbers were adjusted to match forage amounts. In the winter, the goal was to graze and trample most of the standing forage to enhance litter cover and minimize self-shading that would limit plant growth in the following spring, he said.

The continuously grazed ranches in each county were stocked at approximately the same stocking rates from year to year over at least the previous nine years. They were otherwise selected by the Natural Resource Conservation Service technical staff in each county as being representative of traditional continuous-grazing ranches in the region.



“The results we measured, representing the combined positive effects of multi-paddock management, indicate the multiple advantages of this management option,” Teague said. “Multi-paddock grazing resulted in a higher proportion of desirable tall grasses, a lower proportion of less desirable short grasses, annual winter-growing grasses and forbs, and higher standing crop, even with a higher stocking rate than the lightly stocked continuous grazing.”

Although the stocking rate was less with lightly stocked continuous grazing, the preferred plants and areas were never allowed any recovery under continuous grazing while multi-paddock grazing, correctly managed, prevented overgrazing and allowed for adequate recovery after defoliation, he said.

By ensuring light-to-moderate use in the growing season with adequate recovery, the preferred forages are able to capitalize on good growing conditions, Teague said.

“The use of multiple paddocks per herd on commercial ranches spreads grazing over the entire landscape in the numerous smaller paddocks, rather than allowing a concentration of grazing pressure on preferred areas in the landscape,” Teague said.

“It also provides the manager with the option of regulating the grazing pressure on preferred areas and plants by adjusting when to move animals to a new paddock, and provides the means to allow grazed plants to recover before they are grazed again.

“If managers adaptively respond to the ever-changing climate by changing the periods of grazing and time allocated for plant recovery, and adjust livestock numbers to match the available feed, as the multi-paddock grazers in this study did, negative effects of grazing by the livestock can be minimized.”

# Incentive Programs

## Proposed Incentive Programs for Improved Rangeland Management

### Partnership Programs

#### The New Mexico Rangeland Partnership (NMRP)

The New Mexico Rangeland Partnership would ideally bring federal, state, and private funders together to form a program designed to provide ranchers with financial cost-share assistance to enhance management of their existing property. This could include ranching practices that enhance wildlife habitat and forage/browse productivity, biodiversity of plants, soil health, and water quality. Participants in the program would be eligible to receive up to 65% cost share.

#### NM State Land Planned Grazing Pilot Project

The State Land Office would provide a 5-year low-cost/free state land lease to demonstrate results of planned grazing, while the State would provide funding for research to be conducted on the implementation and results of those grazing practices.

#### NM Grown

The State would develop a reimbursement program for all businesses purchasing food grown in New Mexico. Member producers and retailers would receive cost-share funds for advertising and purchase NM Grown promotional items at cost. Member restaurants would be reimbursed up to \$12,000 a year for purchases of NM Grown products under the Restaurant Rewards program.

### State Programs

#### The New Mexico Rangeland Improvement Program (NMRIP)

This state-funded program (modeled after Colorado and Idaho state programs) would provide small grants or reimbursement of rangeland improvement expenses such as improving wildlife habitat, controlling erosion, establishing woody or grass plantings, or implementing stream improvements.

### Federal Programs

#### Rangelands Management Assistance Program (RMAP)

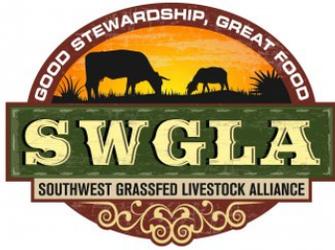
The RMAP (modeled after an NRCS federally-funded program AMA) would provide financial incentives to New Mexico ranchers to improve ranch practices through planned grazing that demonstrates improved rangeland plant, soil, and water quality, with reduced soil erosion. Under RMAP, qualified producers would receive up to \$50,000 in assistance to implement these practices per year.

Three western states are currently involved in the NRCS-AMA program; Nevada, Utah, and Wyoming. NRCS criteria for states to be eligible for AMA participation are traditionally low enrollment in federal crop insurance programs. Another option is to work closely with state NRCS personnel to see if comparable programming could be developed in New Mexico.

### **New Mexico Landowner Incentive Program (NMLIP)**

The NMLIP would use federal funding that would be distributed to ranchers in New Mexico. Landowners would be eligible to receive both technical and financial assistance with the program funded by federal LIP grants, which the state of New Mexico would need to apply for. LIP provides technical and financial assistance to private landowners to protect and manage habitat to benefit federally listed, or proposed at-risk species on private lands. Habitat restoration practices would include planned grazing to address issues such as: decadent sagebrush stands, fuel breaks to control the spread of wildfires, stream channel restoration, and riparian health.





## Southwest Grassfed Livestock Alliance

### Supporting Local Livestock Production in New Mexico

Although New Mexico is one of the nation's major producers of livestock, **only 1-2% of all beef consumed in NM is actually raised and processed in-state.** This is despite the fact that **over 90% of New Mexican's have indicated a preference for local beef** (survey conducted by Beef Checkoff at NM State Fair 2010.) The major challenges for righting this imbalance involve the currently limited local food infrastructure. Local meat processing is extremely limited, with only 4 small scale USDA approved facilities in the state, and necessary systems of storage and distribution to support local marketing and retail efforts are minimal. Other challenges center around consumer awareness and financial incentives for retailers, restaurants and institutions to purchase local product.

As fuel and feed prices continue to rise, along with consumer awareness concerning the health benefits, the demand for grass-fed beef and other locally-sourced livestock products in the US is increasing at a rate of 10-20%/year. ***As extreme drought conditions continue to threaten the economic viability of ranching, two production practices in particular have emerged as a means of financial survival: first is the implementation of holistic land and livestock management to increase the amount and diversity of forage, and second is the marketing of livestock as a local/grass-fed product for a premium price either direct to consumers or to retailers through a cooperative or marketer.*** Over the past ten years, SWGLA has conducted statewide outreach efforts, including workshops for over 400 family farmers and ranchers and tastings/educational outreach to thousands of consumers in New Mexico. The feedback from these events and from our members/producers has indicated the following:

**Consumers:** There is a great deal of interest in 100% pasture raised meat, particularly due to the superior health benefits and rich flavor of the dry aged beef.

**Producers:** Many small-scale ranchers are interested in the opportunity to raise and sell grass-fed/pasture-raised beef and other livestock products including pork, chicken, lamb, dairy products and wool. Producers align with the environmental ethos and hope to realize the economic benefit.

### Additional Support is Needed:

While educational and outreach efforts have helped, there are identifiable changes necessary to facilitate the channels between producer and consumer and create a more economically viable alternative for New Mexico ranchers. These include the following:

- **An increase in the number of USDA certified small-scale processing facilities** situated in key areas, ideally not more than 120 miles distance from producers. Satellite harvesting facilities could be situated throughout the state, with supporting centralized cut-and-wrap and distribution centers in major metropolitan centers such as Albuquerque and Las Cruces.

- **A commitment to maintain the integrity of locally sourced New Mexico livestock products.** This means that local livestock products are not just “born and raised” in New Mexico – but also “finished”, processed and distributed. Shipping cattle out of state to industrial feedlots and slaughterhouses, for example, would not be considered “local”.
- **Economic incentives for business and institutions to purchase New Mexico beef and other agricultural products.** They could be modeled on existing state programs such as “Kentucky Proud” which provides tax relief and other incentives to restaurants and retailers who purchase local product.
- **Statewide marketing efforts** that educate consumers about the benefits of purchasing New Mexico pasture-raised/grass-fed beef and the best methods for storage and preparation.
- **Increased availability of storage facilities** (preferably near distributors) where beef can be refrigerated or frozen.
- **Outreach efforts to educate restaurants** on the best cuts and preparation methods based on seasonal availability, also on the use of the “whole animal”.
- Enabling on-farm/ranch-direct marketing by giving farms/ranches **an exemption from liability lawsuits for products produced and sold on premise.**

### **Benefits for the State of New Mexico:**

- Increased options and income opportunities for New Mexico livestock producers
- Increased state tax revenues, as more of the dollars spent on all facets of meat production and consumption are maintained in-state.
- Preservation of small-scale ranching statewide
- Enhanced health and safety for New Mexico consumers
- A strengthened statewide base of local agriculture systems
- Preservation of open space and reduced pollution
- A reduction of the “carbon footprint” of a New Mexico burger/steak from over 3,000 miles to between 100 and 500 miles.

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*The Southwest Grassfed Livestock Alliance (SWGLA) is an alliance of producers, consumers, land managers, conservationists, and researchers that seeks to improve human, ecological and animal health, and strengthen local agricultural communities by educating producers, and the public about grass-fed livestock products.*

Post Office Box 22538, Santa Fe, NM 87502 Director, Laurie Bower 970-390-5597

[info@grassfedlivestock.org](mailto:info@grassfedlivestock.org)

[www.grassfedlivestock.org](http://www.grassfedlivestock.org)

## Model Financial Incentive Program Summary

The top financial incentive programs used as suggested programs for New Mexico to encourage adoption of effective ranch management practices are:

### I. Agricultural Management Assistance (AMA)

Located in 16 states; Connecticut, Delaware, Hawaii, Maine, Maryland, Massachusetts, Nevada, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Utah, Vermont, West Virginia, and Wyoming, AMA provides producers with conservation, technical, and financial assistance to construct or improve water management or irrigation structures, plant trees for windbreaks. In order to improve water quality and mitigate risk, producers are also provided assistance in diversifying their operation, and improving their conservation practices including soil erosion control, integrated pest management, and transitioning to organic farming. Qualified producers can receive a maximum of \$50,000 per calendar year. **Since 2009, the AMA program has signed financial assistance contracts with 1,055 producers, at a cost of over \$20 million, with a total of 183,068 acres affected.**

### 2. Texas Prairie Wetlands Project (TPWP)

The Texas Prairie Wetlands Project is a partnership between Ducks Unlimited, Texas Parks and Wildlife Department, U.S. Fish and Wildlife Service, and NRCS. TPWP works with private landowners to restore, enhance, and create shallow-water wetlands throughout a 28-county focus area. The program provides financial cost-share assistance to private landowners for habitat enhancement, levee construction, and the installation of water control structures and delivery systems. Participants in the program are eligible to receive up to 65% cost share, while responsible for at least 35% of improvement cost. **TPWP began in 1991, and since its inception has improved habitat on over 63,000 acres, with 2,500 additional acres slated for habitat improvement and restoration in 2014.**

### 3. Cooperative Habitat Improvement Program (CHIP) – Colorado The Habitat Improvement Program (HIP) – Idaho

CHIP helps area landowners develop and improve wildlife habitat, control erosion and enhance farm and ranch aesthetics. The program is flexible and intended to improve wildlife habitat without affecting agricultural production. CHIP provides both technical assistance as well as small grants up to \$4,000 to complete various projects such as woody plantings, grass plantings, wetland enhancements, and stream improvements. Individual land owners are eligible to apply to CHIP for financial assistance. **Since 1993, the Habitat Improvement Program has contributed over \$80,000 to help share the cost of establishing 1,325 acres of wildlife habitat.**

HIP is designed to help private landowners; primarily farmers and ranchers, enhance upland game bird and waterfowl habitats. The HIP provides both technical and financial assistance, with financing providing by a portion of all hunting license fees. Once a farmer or rancher is approved for the program, they can be reimbursed up to 75% of out of pocket expenses, with a cap of \$10,000 per project. **The program has been in existence approximately 14 years and has established 4,100 agreements on more than 70,000 acres of land.**

#### **4. Landowner Incentive Program – Utah**

The Landowner Incentive Program in Utah is a new, voluntary program, funded by federal LIP grants. LIP provides technical and financial assistance to private landowners to protect and manage habitat to benefit federally listed, or proposed at-risk species on private lands. Habitat restoration practices include mechanical treatment of decadent sagebrush stands, fuel breaks to control the spread of wildfires, stream channel restoration, and riparian plantings. Program just began in 2013; no results are available yet.

#### **5. Beefing Up the Palouse—an Alternative to the Conservation Reserve Program**

The Beefing Up the Palouse Pilot (Washington State) explored several aspects of converting land managed in the Conservation Reserve Program (CRP) to a holistically managed resource using livestock as the principle tool to move towards sustainability. The program demonstrated that there is far greater (3-4 times) potential productivity (or even more with intensive planned grazing) in the eastern Palouse that could provide returns greater than the current CRP payments/acre. Initial pilot grazing on overrested land achieved gross income comparable to CRP payments.

#### **6. Kentucky Proud**

Kentucky Proud is part of the Kentucky's Department of Agriculture's Diversification Program in which they have spent \$385 million to encourage the purchase of Kentucky agricultural products. Kentucky Proud members benefit from the program's ongoing statewide promotional campaign. **Kentucky Proud generated \$250 million in retail sales through Kentucky Proud member retailers in the last three years.**

Member producers and retailers may receive cost-share funds for advertising and purchase Kentucky Proud promotional items at cost. Member restaurants may be reimbursed up to \$12,000 a year for purchases of Kentucky Proud products under the Restaurant Rewards program.

# Appendix



Improving Life through Science and Technology

## Planned Grazing to Improve Soil Health and Ranch Livelihoods

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New Mexico Ranching Summit, Ranney Ranch  
HMI and the Thornburg Foundation  
29<sup>th</sup> April 2014

Richard Teague,  
Texas A&M AgriLife Research, Vernon

### Overview

- Need to improve ecosystem function
- Need for more applicable research
- Managing *adaptively* for desirable results
- Testing a ranch scale hypothesis
- Published research results
- Conclusions



### Improving Rangeland Ecosystem Function

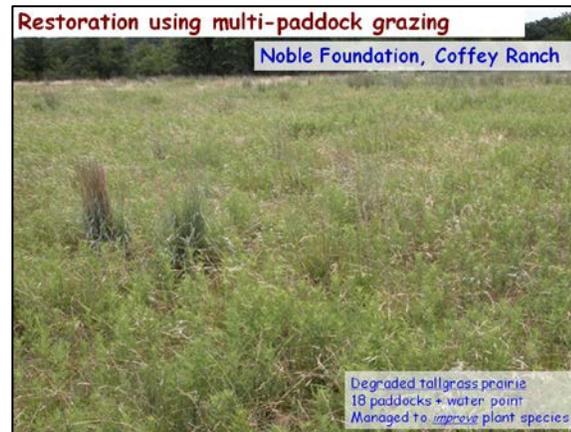
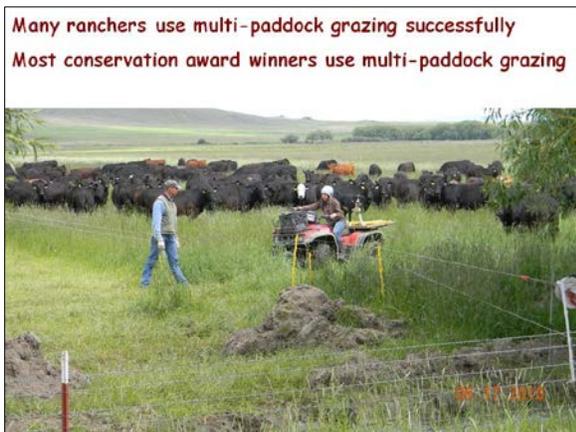
- Healthy agro-ecosystems are considerably more productive, stable and resilient than those in poor condition.
- Ranch livelihoods depend on healthy ecosystems
- The value of ecosystem services to society is worth more to society than agricultural earnings.



### While many rangeland scientists believe:

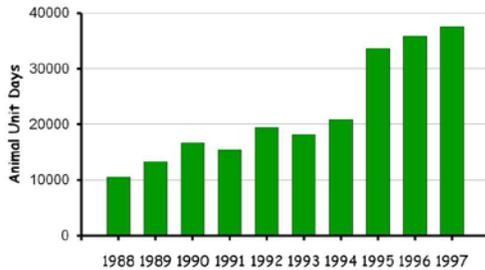
“There is no reason to favor rotational grazing over continuous grazing and conservative stocking”

Briske et al 2008.

## Restoration using multi-paddock grazing

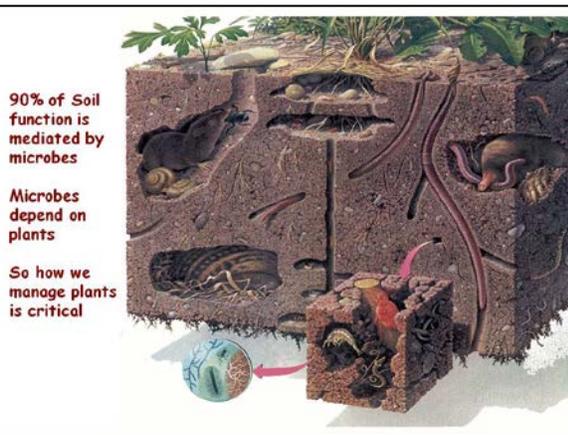
Noble Foundation, Coffey Ranch  
Charles Griffith, Hugh Aljoe, Russell Stevens



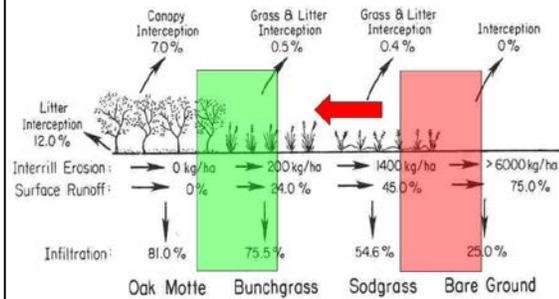
## Managing for Desired Outcomes

- Match animal numbers to available forage
- Spread grazing over whole ranch
- Defoliate moderately in growing season
- Short grazing periods
- Adequate recovery before regrazing
- Graze again before forage too mature

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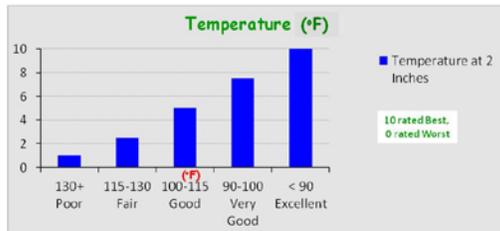


## Infiltration with Vegetation Composition Thurrow 1991



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## Indicator: Soil Temperature



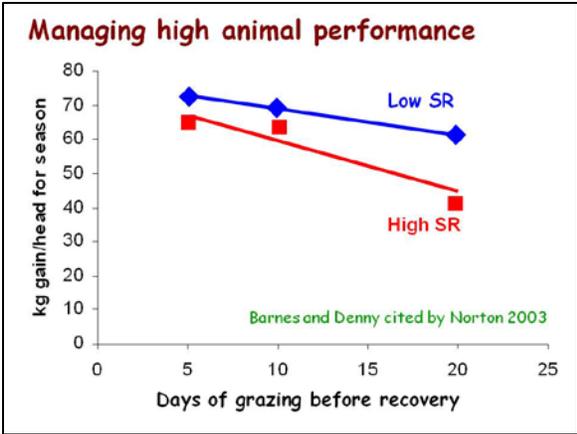
1. At 70 °F, 100% of Soil moisture is used for growth.
2. At 100 °F, 85% of Soil moisture is lost and 15% is used for growth.
3. At 115 °F, microbes begin to breakdown, and
4. At 140 °F they die.

## Decrease drought impacts

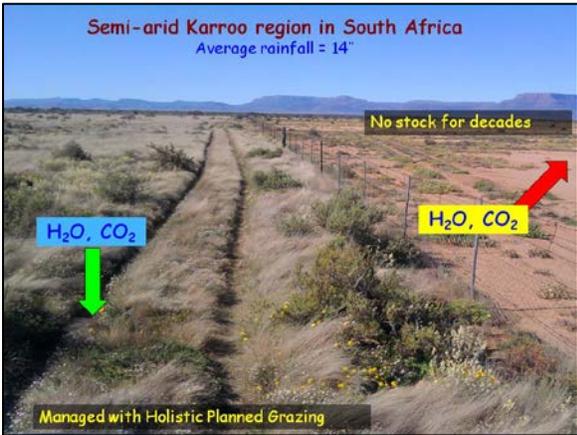
% Leaf Volume Removed	% Root Growth Stoppage
10%	0%
20%	0%
30%	0%
40%	0%
50%	2-4%
60%	50%
70%	78%
80%	100%
90%	100%



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- ### Length of recovery periods
- With moderate use in the growing season:
- In wetter tallgrass areas (30+ inches of rain)
    - Recovery of 45 in wetter years to 90 days in drier years
  - In mixed grass prairie (18 - 25 inches of rain)
    - Recovery of 50 in wetter years to 120 days in drier years
  - In short grass prairie (12 - 15 inches of rain)
    - Recovery of 90 in wetter years to 150 days in drier years
  - In arid rangelands (< 15 inches of rain)
    - Recovery of full growing season or more
- Based on some published science and experience*  
Teague et al., 2013



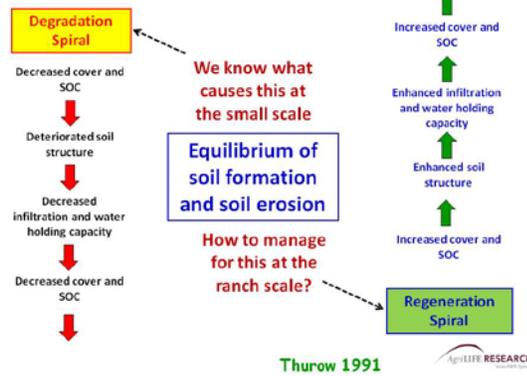
- ### Reasons for failing to get positive results
- Too many animals before soil and plants had improved
  - Not developing suitable stock water system
  - Inadequate planning
  - Not adapting as conditions change
  - Defoliating too heavily in growing season
  - Long grazing periods
  - Inadequate recovery before regazing
  - Expecting improvements where conditions are very limiting
- Teague et al. 2013

## Previous research

Research generally:

- Had no goal to achieve best results
- Has ignored influence of spatial scale of commercial ranches
- Used small-plot reductionist experimental design
- Too many animals before soil and plants had improved
- Has not adaptively managed as conditions change to achieve desirable goals
- Has had inadequate recovery periods
- Has been very short-term

Teague et al. 2013

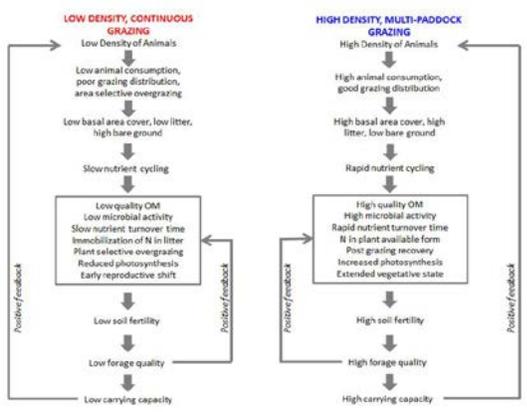


## An Alternate Ranch Scale Hypothesis

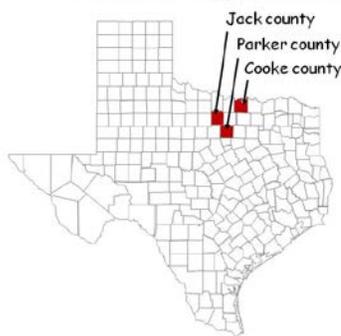
We propose and test the hypothesis that at the *commercial ranch scale*:

Planned multi-paddock grazing, *when adaptively managed* to give best vegetation and animal performance, has the potential to produce superior long-term:

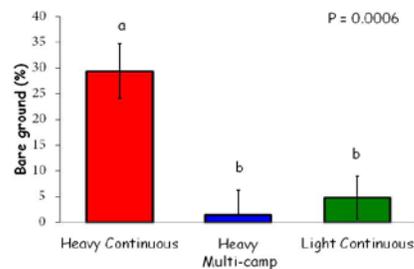
1. Conservation and restoration of resources;
2. Ecosystem goods and services; and
3. Ranch profitability



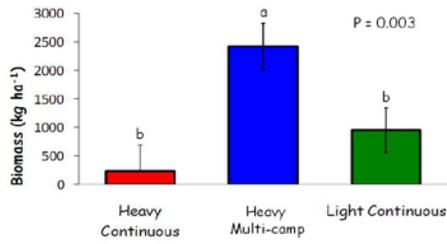
## Influence of multi-paddock grazing on soil and vegetation



## Bare Ground

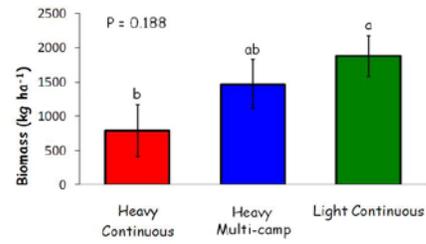


### Tall Grasses



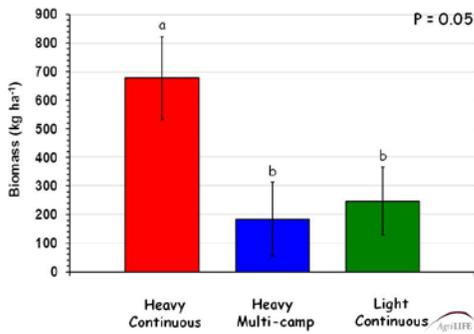
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### Mid Grasses



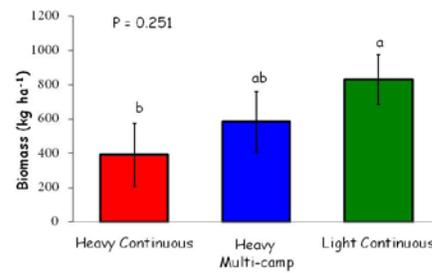
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### Cool Grasses



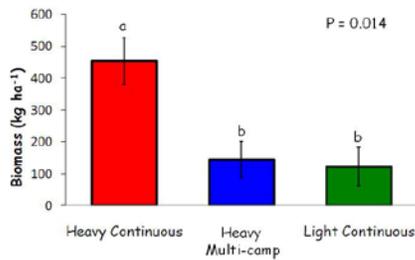
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### Perennial Forbs



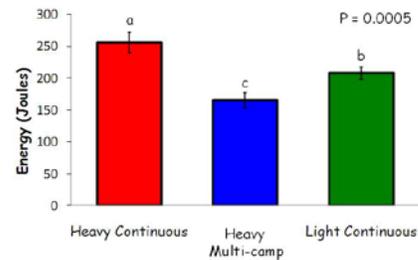
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### Annual Forbs



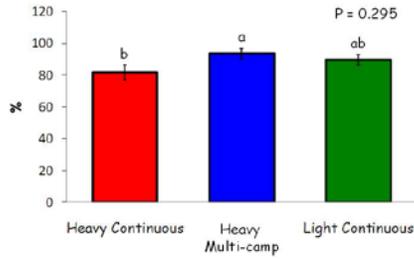
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### Penetration Resistance



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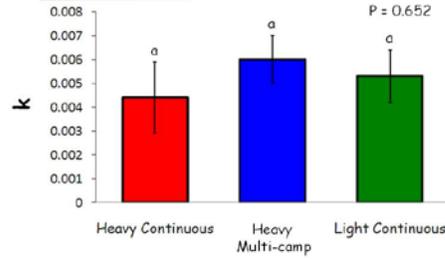
### Aggregate Stability



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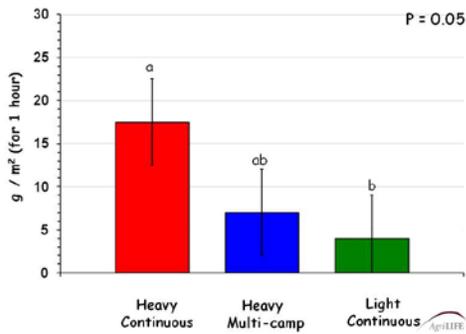
### Infiltrrometer

Hydraulic conductivity (k) mean of 1 & 4 cm tension



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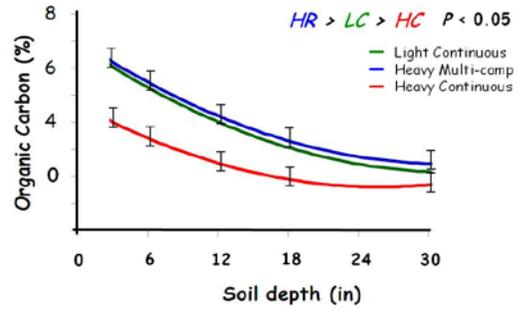
### Sediment loss



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### Soil Organic Carbon

NB The difference between HR and HC is 52 tons/ha



### Soil Carbon and Water

Relationship between soil organic carbon and soil water holding capacity (0-30 cm) From Jones 2006

Change in SOC concentration	Change in OC stock (kg/m²)	Extra water holding (litres/ha)	CO <sub>2</sub> sequestered (t/ha)
1%	4.2	168,000	154
2%	8.4	336,000	308
3%	12.6	504,000	462
4%	16.8	672,000	616

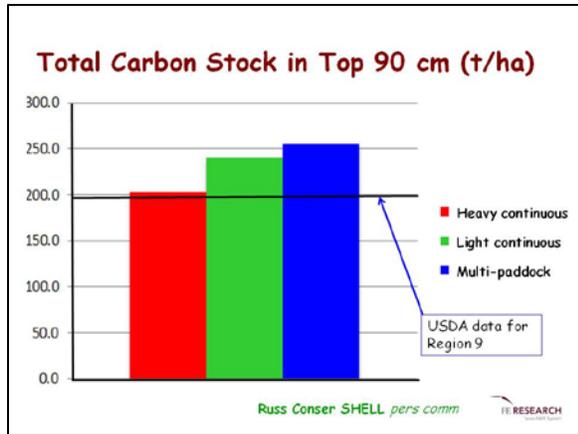
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### Soil Carbon, Nutrients and Water

Relationship between soil organic carbon and soil water holding capacity (0-30 cm)

Parameter	Heavy Continuous	Light Continuous	Multi-paddock
Soil Organic Carbon	3.1b	4.4b	4.86a
Cation Exchange Capacity	24.6b	23.7b	27.4a
Water holding (Gal/acre)	55,700	79,059	87,324

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## Tested hypothesis

Our results do not refute the hypothesis that at the *commercial ranch scale*:

Planned multi-paddock grazing, when *adaptively managed* to give best vegetation and animal performance, has the potential to produce superior long-term:

- Conservation and restoration of resources;
- Ecosystem goods and services; and
- Ranch profitability

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## Conclusions

Successful multi-paddocks managers use:

- Flexible stocking to match forage availability and animal numbers
- Spread grazing over whole ranch
- Moderate grazing during growing season
- Short graze periods
- Allow recovery before regrazing
- Graze again before forage too mature
- Adaptively adjust to prevailing conditions

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