The Quivira Coalition

Journal

Fostering a Land Health Movement

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Building Resilience (Part I)

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From the Editor's Desk

The theme of this issue of our Journal – and the next one as well – is based on our successful Seventh Annual Conference, titled "Building Resilience: Creating Hope in an Age of Consequences."

Building resilience – which the dictionary defines as "the ability to recover from or adjust easily to misfortune or change" – is now the main focus of The Quivira Coalition. We've even adjusted our mission statement to reflect its increased emphasis in our work. It now reads: The mission of The Quivira Coalition is to build resilience by fostering ecological, economic and social health on western landscapes through education, innovation, collaboration, and progressive public and private land stewardship.

Of course, we've always had resilience in mind – which is why we consider ourselves to be a "land health" organization. Healthy land is the foundation of a healthy economy.

But as events pick up speed nationally, and even globally, the need to build resilience is becoming increasingly urgent. So, we're jumping in with both feet. In this issue, we study resilience from an on-the-ground perspective, including stories from the Navajo reservation, the French Alps, Mongolia, and Santa Fe, before concluding with an original poem by Art Goodtimes inspired by the Conference.

We hope you enjoy the adventure. Let us know what you think.

Happy reading! Courtney

Quivira Coalition Board Members

Feature

Preserving Lifeway Traditions And Heritage Breeds for a Resilient Future

*by Gay Chanler**

I would like to introduce to you three Navajo sheepherders, and their story that reflects resilience in our Southwest food system. The story is really about the knowledge and traditions of the Navajo people. This knowledge embodies the capacity not only to thrive in adverse conditions of an arid landscape, but also fosters a rich, dynamic culture that functions in harmony with the land, and with a reverence for the people and creatures that share it.

Jay Begay's Navajo-Churro Sheep and Angora Goats grazing on traditional winter range. (photo by Jay Begay, Jr.)

Roy Kady, Colleen Biakeddy and Jay Begay Jr. are stewards of this knowledge, and of a unique heritage breed of sheep, the Navajo-Churro sheep. The traditions that they maintain and teach to young Navajo embody important qualities of a resilient food and land management system, which has allowed the Navajo people to thrive in a marginal landscape for centuries. They will tell their own stories here today.

I represent Slow Food, a worldwide movement devoted to "eco-gastronomy" – that is, a food system based on the principles of high quality and taste, environmentally sound production and processing, and social justice. In other words, a movement in favor of food that is "good, clean, and fair;" and all that is the antithesis of fast food.

It started in Europe where many people have resisted the onslaught of industrialized fast food and the threats it represents to their food traditions. We remember, perhaps, the angry French farmer who drove his tractor into the plate glass wall of a McDonald's in France. He was applauded by like minded French folk across the land, but he was arrested and fined, and silenced after a brief moment of glory. In contrast, when the first McDonald's opened in Rome the Italians started a movement called Slow Food.

Since 1986 it has grown to more than 85,000 members in 43 countries, working to protect food traditions, artisan foods and small producers and to defend the right to the pleasures of taste that come from eating wholesome, diverse and sustainably raised foods. Slow Food believes that biological diversity, traditional knowledge and ecological integrity are vital to the health and security to our food system

To this end, Slow Food developed two tools: the Ark of Taste and the Presidia. The Ark documents foods that are delicious, culturally important, biologically important, and disappearing from production. By identifying endangered foods this way, efforts to resurrect them can be developed by raising public awareness about them, through tastings, restaurant offerings, publications and films. In certain cases marketing efforts are undertaken and the resulting collaborations of producers and Slow Food are called Presidia, which is a (plural) Latin term for fortress.

*presented at our 7th Annual Conference

There are over 300 Presidia worldwide, representing traditional producers of every sort of food product, from cheese, honey, vanilla, amaranth, to various breeds to sheep, pigs, poultry, cattle, and even reindeer. The Navajo-Churro Sheep presidium is one of six such marketing efforts in the US, designed to bring the meat of this rare breed to regional market, thus offering a value-added product to the already growing market for Navajo-Churro fleece and yarn.

Traditional Navajo at Lazy J Diamond Ranch. Sheep Shearing. (photo by Jay Begay, Jr.)

The Churro sheep is the original sheep of the Dine, or Navajo people, sacred and integral to their culture. Its appearance is foretold in their creation stories, and the prophecy was fulfilled with the settlement of the Spaniards in what is today northern New Mexico in the 17th century. This breed of multicolored, double-fleeced sheep adapted well to the arid plateaus and rugged canyons of the Southwest and provided food and fiber to the Hispanic, Pueblo, and Navajo people for centuries. It is the oldest land-race of sheep in the United States and has qualities of hardiness, disease resistance, good mothering and survival instincts, and excellent fleece. The sheep are smaller and leaner than other breeds; they require minimal water; their wool is not very greasy and does not require much water for cleaning. Unlike larger livestock such as cows and horses, Churro sheep are gentler on the landscape. These traits are important to biological diversity as well as being environmentally appropriate for the region.

Nevertheless, the Churro has narrowly escaped extinction. Twice the breed suffered drastic slaughter. US military war tactics in the 1800s against the Navajo wiped out most of their flocks, and burned their fruit trees. The Navajo were forced to leave their homeland on The Long Walk to Bosque Redondo. Later, after the dust-bowl of the 1930s, government stock reduction programs, aimed at diminishing the effects of drought and over-grazing, reduced Churro numbers by hundreds of thousands and introduced other breeds with fatty meat and short-fibered fleece. By the 1970s, only a few hundred Churro remained. Concerted efforts by a handful of Navajo, Anglo and Hispanic individuals who recognized the value of the sheep, and searched for remaining individuals to breed, led to the establishment of several grass-roots organizations dedicated to restoring the breed. Today, there are more than 5,000 registered animals in the United States.

Traditional sheepherding methods mean that the sheep graze freely on the range. They eat desert sage brush, juniper and a variety of native grasses and forbs that give a distinctive herbal flavor to the lean, sweet meat. Some flocks are herded from low elevation pastures to the high mountains in the summer where the forage changes. The sheep are raised without antibiotics, are wormed by smoking and are not dipped with chemicals. The meat is healthy, all natural and full of the flavors of the "terroir." While the Navajo eat much of the meat they produce, surplus does occur, and in the case of the Navajo-Churro this is a potentially valuable economic bonus for those who raise them primarily for their wool.

Creating a viable regional market for this meat is the goal of the Slow Food Presidium project, which was formally launched in 2006, with the support of the Navajo-Churro Sheep Association (N-CSA), the Navajo Sheep Project, Dinë Bë iina (Navajo-Lifeways) (DBI), Slow Food Foundation for Biodiversity, RAFT (Renewing America's Food Traditions), and the American Livestock Breeds Conservancy.

Into our second year now, we are pleased to have gotten the word out to an ever growing audience, and meat to local residents and chefs in northern Arizona. Response has been excellent, current demand outstrips supply by three to one. Efforts are underway to enlist participation of more shepherds with registered sheep. DBI and N-CSA are training more inspectors and refining the registration procedures. A production protocol for lamb meat is being finalized and approved by the international office in Italy. Long-term goals include more economical transport for processing and delivery by acquiring a diesel truck, and eventually a USDA mobile slaughter unit that can serve more areas of the reservation.

We will proceed slowly, carefully to ensure the survival of the wonderful Navajo-Churro sheep for fiber, for food, for cultural survival, for the future.

Sources:

- Nabhan, Gary Paul, 2006. "The Return of the Navajo-Churro Sheep to Loom and Table," Northern Arizona University, Center for Sustainable Environments, Flagstaff, AZ.
- Navajo-Churro Sheep Association website: *www. Navajo-churrosheep.com*.

Gay is currently co-leader of Slow Food Alta Arizona convivum, a regional chapter of Slow Food. She serves on the national Slow Food Ark and Presidia Committee, which works to protect and promote disappearing varieties of traditional foods of exceptional taste, and which supports producers of these rare or endangered foods. Gay is coordinator of the Slow Food Navajo-Churro Sheep Presidium project, enabling Navajo sheepherders to market the meat of the traditional but endangered Navajo- Churro breed of sheep, thus also keeping alive the cultural and economic survival of the Navajo lifeway.

Her love of authentic, wholesome, natural food, and her interest in food history and cultural traditions led to her involvement with Slow Food, an international organization which aspires to uphold, preserve and promote these values as well as to protect biological diversity within the food system.

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Left to right: Jay Begay, Jr., Roy Kady, Colleen Biakeddy and Gay Chanler at The Quivira Coalition's 7th Annual Conference.

Colloquium

Shepherds' Know-How Faced with Globalization and Nature Conservation: a French Experience*

by Michel Meuret and Mick Gascoin

Compared to the USA, France is a small country: its size is about two or three Western States and the population is 64 million people, including ~1300 professional shepherds. France is a country where people have been herding sheep since around 2.000 B.P., when long dry periods, due to climate change, drastically reduced the number of wild species to hunt. We will not tell you about the whole story, as we will jump to the past hundred years.

Herding sheep in the French Alps.

Some big changes to deal with

The past one-hundred years were a pivotal period in Europe including World Wars I and II. Millions of French people were killed, mostly civilians. Many young people were working at that time in agriculture, some as shepherds.

Before then, shepherds were the family's youngest boys, who didn't go to school. Some of them also came from Italy and Spain. Many were paid a little money, but sometimes with a bottle of wine. Today, most of them are French young urban people searching for a job with a societal meaning and a better life, far away from the overcrowded and polluted city life condition. They have no family history of shepherding (Figure 1).

Before, shepherds were herding small village flocks for wool production, manure for local cereal crops and also some meat. Every move was made on foot, including the transhumance (a form of pastoralism organized around the migration of livestock between mountain pastures in warm seasons and lower altitudes the rest of the year). Now, shepherds mostly herd large flocks from several breeders, for either lamb meat or ewe cheese, with the help of modern facilities such as trucks and solar panels over the shepherd's cabin.

Who cares about the shepherds' job anyway? Before, it was local people and family farmers, plus national foresters who worried about overgrazing. Now, it's diversifying a lot. Now people involved in the meat, lamb and cheese markets, in the European policies for landscape and biodiversity conservation request targeted grazing and people for whom a sheep flock

* This article is a condensed version of the talk presented at our 7th Annual Conference, January 2008.

reminds them of their grandparents' work at the farm.

Another big change to deal with: predators, especially wolves. Before, shepherds were allowed to shoot wolves and, as a consequence, most of the wolves were avoiding human activities. Now, France has internationally protected wolves coming from Italy. For some French people, looking at Yellowstone as the ultimate model, the wolf is an untouchable species that represents by itself the "Nature's welfare." But what about the welfare of the shepherds? Strictly protected wolves develop opportunistic behavior. They spread all over the country, even nearby villages, and they prefer to feed on domestic sheep than on wild ungulates. This is a huge stress for shepherds, nowadays they are restricted by law to an individually and poorly efficient self-protection system.

Figure 1. Most shepherds today are urban youth.

Why are French shepherds still there?

There are five reasons. The first one is the living pastoral cultures, mostly in the hills and mountain areas: in the Pyrenees, with dairy sheep from which are made delightful cheeses; in the South-Eastern region of Provence, with transhumance between the Mediterranean coast and the Southern Alps; in the Northern Alps and, last but not least, on the Mediterranean island of Corsica.

One point is discouraging in terms of shepherds' employment by breeders: the price of lamb meat has constantly declined for 30-years due to imports. In March 2007, the price of lamb carcass was only about 2.5 $/pound. Financially speaking, it is no longer profitable to breed sheep in France, except for producing a well-known local cheese. It is no longer viable if there is no sheep farming support by European subsidies and local grazing contracts. And that's the second reason: shepherds are still being paid for the job. But even with that money, the total income of a French sheep breeder is similar to the salary of a full-time supermarket cashier's.

A third reason is that strong efforts have been made by France to support collective grazing and to legalize access of shepherds and herders to unused parcels of land. This is because France has a big problem: land division, with family inheritance over two centuries cutting the land into small plots, each one belonging to another owner. Most of the owners are now living in the cities. They don't care, and sometimes they even don't know where their plots are located. That is why France implemented three legal tools in 1972 : (1) a "Multi-Year Grazing Agreement"; (2) to be signed after the formation of a "Breeders' Grazing Trust"; and (3) a "Land Tenure Grazing Trust" formed under the local Mayor's supervision with different land owners. These legal tools are implemented with the help of Grazing Local Services, a free public service.

A fourth reason is the promotion of grazing to help manage vegetation dynamics. In the past, the situation was: too many shepherds, herders and wood collectors. That led to severe overgrazing and damage to landscape, especially in dry mountain areas. After that, the French National Forest Service, who owned large parts of the land, said good-bye to shepherds, and planted pine trees to "restore the soils." However, sometimes it was, and still is, a green desert. But foresters did not get enough funding to manage plantations, to fight against shrub dynamics and to prevent wildfires. This is why shepherds are now called to the rescue, to limit encroachment dynamics and to re-create, through targeted grazing, a more diversified and less flammable landscape. This is a part of what we call in Europe "Agri-Environmental grazing contracts," mostly promoted by regional and national parks managers, nature conservationists, and wildlife reserve managers.

The fifth and last reason is that France has five Shepherding schools that welcome an overall of 60+ trainees per year. That means a renewal of the shepherds' population of around 2.5% yearly. Trainees are mostly young urban people, who discovered the school while browsing on the Internet. It is in strong demand, about 100+ candidates per school per year, but there is also a high dropout, as many of the candidates are kind of dreamers. The school generally offers one year of training that involves sheep breeders and professional shepherds: (1) trainees have an initial field experience with an experienced shepherd; (2) back to school, with most of the class contents aimed at responding to practical questions; (3) a second field experience. In the end, most of the trainees are recruited by a breeder, or a Breeders' Grazing Trust.

Figure 2. A shepherd can teach his flock to respect grazingland's limits, using his/her dog(s), placement and some cry that the flock already knows means the shepherd disagrees.

Confusing perspectives

Nowadays, there are confusing perspectives for French shepherds. On one side, globalization is affecting even small village breeders, making it harder to pay for a shepherd's salary. On the other side, there is a growing interest to support grazing for environmental purposes: wildlife habitat restoration and forest fire prevention.

But sheep breeders would prefer to be paid well for producing lamb meat rather than live mainly on subsidies. And shepherds don't want to become strict "nature gardeners."

The only point we can say with confidence is that the legitimacy and the money for shepherding will come more and more from environmental demands. That's because there is a consensus in Europe: "Grazing is good!" To maintain diversified landscapes, to help to conserve and restore biodiversity and wildlife habitats.

Ok..., but why not replace the shepherd, and his salary, by some efficient fences? Well, this would not be good at all. We will try to explain now our point of view about this.

A shepherd is not a temporary fence!

A shepherd can teach his flock to respect grazingland limits. The very first time a shepherd and his flock enter a grazing sector, if the flock doesn't know already where the limits are, the learning process begins:

Step 1 - The shepherd has to let his flock approach one of the limits. He has to stay on the front side of the flock, on a visible place, and he also has to place his dog moving visibly just on the limit. When the front group of sheep comes near the limit, he has to shout loudly, something like "Hôôô!" (Figure 2). The flock must already know that this cry means that the shepherd disagrees and, at that moment, the flock moves in another direction.

Step 2 - The next day, when grazing on the same sector, the shepherd places his dog again on the limit, but this time motionless. It's a reminder for the flock, and usually, the flock turns of its own when arriving at that limit. But, when dealing with sheep, if a part of the flock insists on crossing that limit, the shepherd has to shout again, exactly the same cry, but staying on the edge of the flock. And it works well.

Step 3 - During the following days, if the flock tries again to take a look over that limit, then just the same cry, this time from behind the flock. The learning is

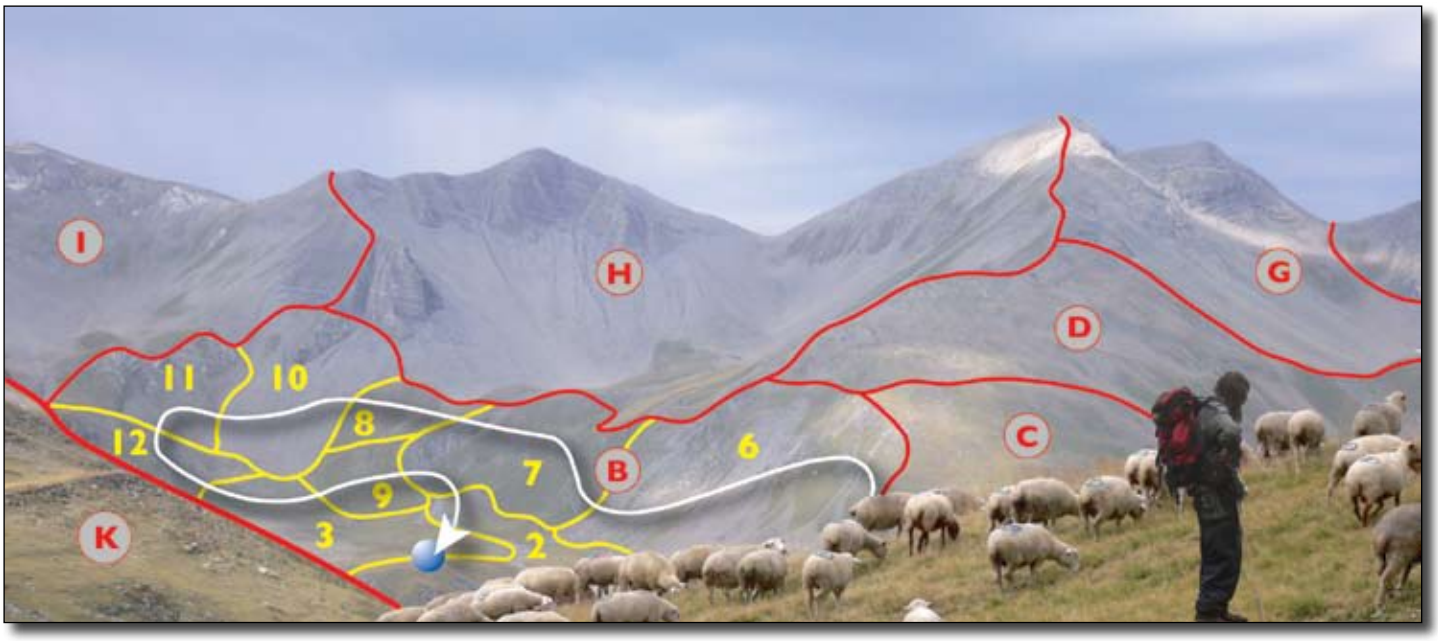


Figure 3. For better grazing management, a shepherd divides the land into distinct "grazing quarters" (red) and "sectors" (yellow).

completed, as the flock now understands that this movement will be off limits.

This practice takes advantage of the animals' excellent spatial memory. That's why shepherds ask sheep breeders to entrust them each year with a majority of already experienced sheep: "It's much easier to work, as most of the flock already knows the mountain!," they say.

Next, the shepherd must appropriately guide the flock inside the limits of the grazing land. This consists of taking full advantage of patchy environments and upgrading the flock's appetite on less palatable feeds.

A primary rule for herding is to teach the flock what range of forage will be available at a definite period. Most shepherds are talented observers of feeding choices, and some of them take daily notes. They know that a certain plant will be selected depending on the grazing location and depending also on what the flock "expects" about the range of plants offered that period.

They also say that sheep select plants depending on a sort of "temporary palatability scoring". One score is: "this is the best for now!" Another: "this is quite acceptable!" And third: "this is not acceptable now!" And they say that shepherding consists of adjusting, almost constantly, the sheep "feeding expectations" - what is on offer on some days and what is not. This is to avoid having the sheep search too much for excellent but not available feeds, because they have been already grazed, or because they are reserved by the shepherd for another period of use.

There are two situations a shepherd will try to avoid. First, allowing the flock to consider a range of palatability scoring much too large for what is actually available. That leads to a constantly frustrated flock and lowers significantly the daily intake. On the opposite end, restricting the sheep to a very narrow and too predictable range of palatability scoring leads to a kind of "grazing weariness" and also lowers the daily intake.

Those are the major principles; now, let's go to practice, starting at the seasonal scale: grazing "quarters" and "sectors."

A shepherd can adjust the range of palatability scoring of the flock in order to upgrade its appetite. The first practice is to divide the land (e.g. a summer grazing place) into distinct "grazing quarters" (see red lines and letters on figure 3). Every quarter must have its own resting places for the flock, for day-time (e.g. the blue spot) and for night-time. These are comfortable places, spontaneously selected by the animals.

Distinct quarters will have to be grazed in succession during the season, with duration depending on their forage content: amount, diversity and maturity. At first sight, it looks very similar to a succession of

fenced pens... but it's not, because within each quarter the shepherd will "interfere" on the feed selection and intake. How?

The shepherd divides each quarter into different "grazing sectors" (see yellow lines and numbers on Figure 3) each being defined by the shepherd as a homogeneous area in terms of a predictable grazing response by the flock: i.e., spontaneous flock movement within that sector and its forage palatability compared to the neighboring ones.

Twice a day, the shepherding "circuit" (see the white arrow on Figure 3) will use a succession of different grazing sectors, to optimize the appetite on less palatable ones, creating for the sheep a "full meal."

At the daily scale: a MENU

For the shepherd, the daily challenge is how to conceive half-day grazing circuits in order to optimize less palatable feeds? This is what we called the MENU Action model, which has been developed with the help of experienced sheepherders in the Alps and with dairy goat herders in Provence (Figure 4). These are very different contexts, but a similar practice, individually and empirically conceived.

When feed intake must be stimulated on a particular sector ("Target-Area", see yellow square at the center of the model in Figure 4) consisting of quite rough and less palatable plants (e.g. very mature grass or a patch of scrub to be cleared), the herder must identify and use complementary, sometimes contiguous, sectors within the same grazing quarter. These complementary sectors, to be included within the circuit, can play one of six distinct "roles" to create synergetic effects on intake during the meal. The different sectors are assessed by the herder according to two simple criteria: the relative abundance of edible material (Y-axis) and the relative palatability (X-axis) of the sector for his flock, during that period of the year.

At the very beginning of a circuit, the herder has to choose between two "starters". When the herd appears to have a very strong initial appetite, because the herder comes a little bit late, or because the weather has suddenly cooled, an "Appetite Moderation" sector, with abundant but not highly palatable plants, can be used in order to reduce an excess of initial appetite. Or, to stimulate a herd having a low initial appetite, because the animals anticipate that the herder will take them again to places they have already been grazed too frequently or because it is too hot, an "Appetite Stimulator" sector could be used, offering a highly palatable resource.

Then, after more or less half an hour of one of these two starters, the Target Area is used for the "Main-Course." It comprises medium plant abundance and palatability. It is possible that this Main Course is sufficient to go to satiety, to fill up the animals, but if it is of medium quality animals often lose interest in this sector after about an hour. At that moment of the circuit, the herder must restore the appetite for the Target Area. And that's the main action, the main trick, of the MENU: the use of a "Booster" sector.

There are two kinds of boosters. The first one (on the right of the model) consists of using a highly palatable sector. Alternatively the shepherd can lead the animals to a very bad quality sector, very coarse, even with spiny and dry plants, in order to have the herd understand that the main course sector is not so bad if compared to that God forbidden place. The

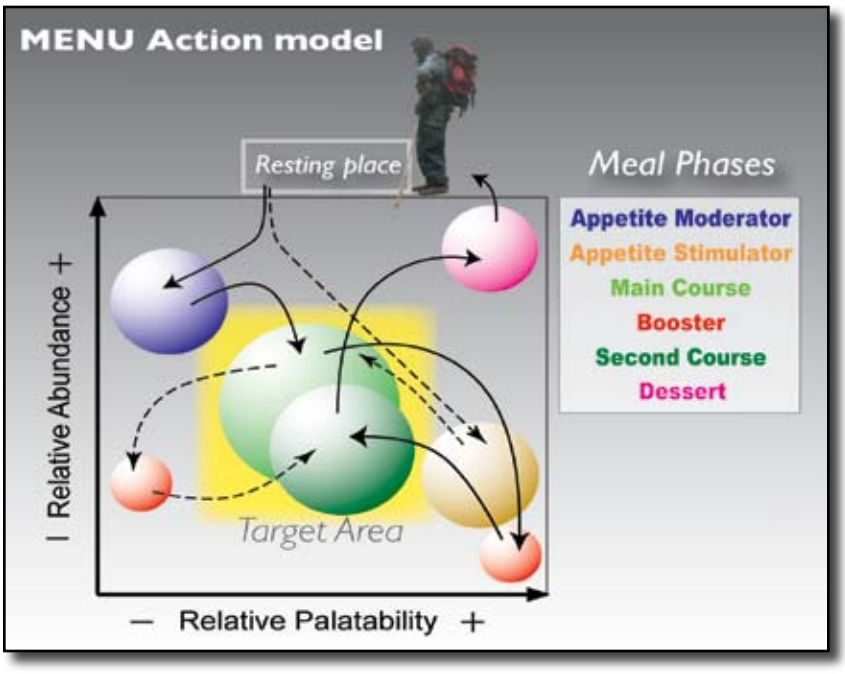


Figure 4. How shepherds optimize feed intake.

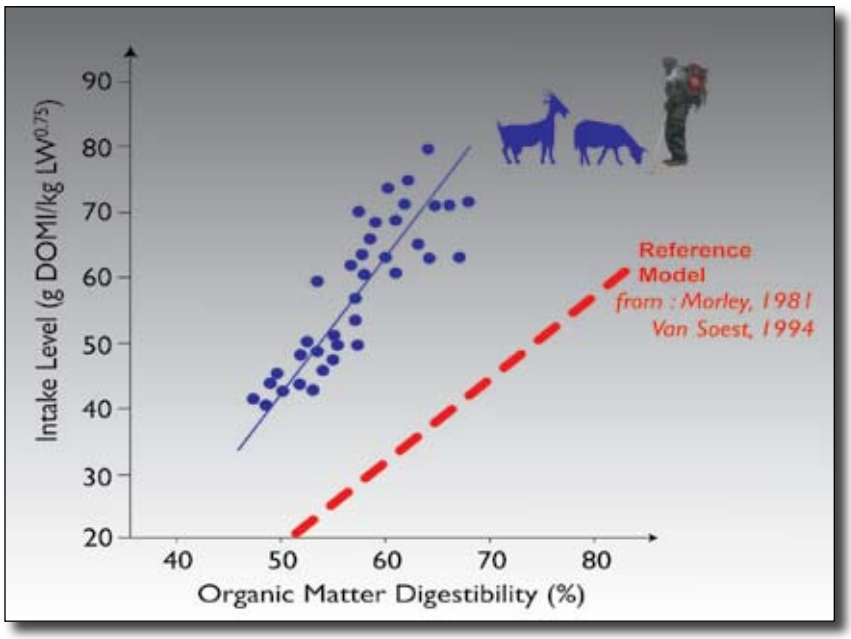


Figure 5. Individual intake levels recorded on rangelands with ruminants that are shepherded are twice the amount predicted by the usual scientific reference model.

duration of use for a Booster sector is about twenty to thirty minutes, no more.

Doing that, the herder makes a profitable use from a very "instantaneous palatability" effect.

After the booster action, the herd is led again to the Target-Area, for the "Second Course," but with a slightly better instantaneous palatability than the Main Course sector, because the circuit, and the meal, goes to its end.

When the animals lose interest in the Second Course, very often there is no more time for the herder to make a new Booster and Course sequence. At that moment, the herder can use a "Dessert" sector, with both high plant abundance and palatability. It is very important this phase of the circuit is not anticipated by the animals. Think about your children at home, if they know they will have dessert in any case...

With goatherders and sheepherders acting with MENU, we recorded individual intake levels that were twice the amount predicted by the usual scientific reference model (Figure 5). That unexpected huge difference is because herders are almost constantly reviving the appetite during meals, but the scientists don't.

Conclusion

In France, it is necessary to redefine the shepherd's job as a multi-functional position at the crossroads between animal production and landscape and nature conservation. The most relevant step will be to start with the work done in shepherding schools, and then define at the national scale what should be a "Qualified shepherd's employment contract" with a decent salary.

Experienced shepherds are key sources of knowledge about how to take full advantage of a diversified landscape's forage resources (Figure 6). They know how to teach the flock to respect the land limits, counting on the animals' excellent spatial memory. They also know how to adjust the animals'

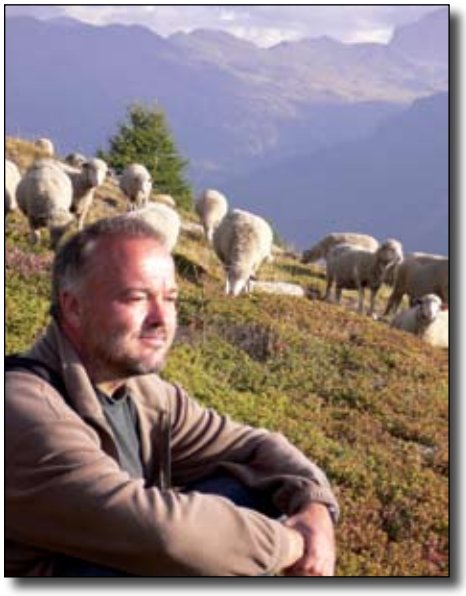
Figure 6. Experienced shepherds are key sources of knowledge about how to take full advantage of a diversified landscape's forage resources.

palatability scoring of the feeds. They know how to design circuits that optimize on less palatable feeds, creating synergistic effects within a meal that boost the daily intake a lot.

This empirical knowledge appears quite familiar if we compare with some of the BEHAVE principles ("Behavioral Education for Human, Animal, Vegetation, & Ecosystem Management" - see: www.behave.org). But the interesting thing is French shepherds never heard a single word about BEHAVE. They conceive their practices very empirically. They certainly heard about John Wayne, but the American West seems to them so big and so far away.

These days, when we are dealing with topics such as: the relationship between humans and livestock, low-stress handling, feeding management on patchy environments, targeted grazing, land division, nature conservation policies and so forth, our respective "old" and "new" worlds come very close together and it becomes obvious that we need to share experiences, to be able to be resilient and face our sometimes confusing "changing times."

For more information: A Sheepherder's Know-How, a book by Michel Meuret and Fred Provenza (eds.), with 30+ contributors is scheduled for release winter 2008-09. Photos and graphics courtesy of Michel Meuret.



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A View from the Field

Resilience and Reciprocity

by Rebecca Watters

Courtney White opened the 2008 Quivira Coalition conference with a question: "If we're asking ranchers to think more like conservationists, why aren't we asking conservationists to think more like ranchers?" The ranchers in the audience came to their feet to applaud. I was on the "conservationist" side of the equation, and the applause jolted me back in time.

Eight years ago I'd stood on the banks of the Orhon River outside Kharkhorin, Mongolia, the town where I'd be teaching ecology and working on wildlife surveys for the next two years. One of the teachers I planned to work with, Norovobanzad, had brought me to the river's edge for a picnic. As we ate, her husband drove their Jeep into the river to wash it. Oil and grimy mud sloughed off into the current, and I winced, but kept my thoughts to myself. As I explained to Norovobanzad why I'd come – to help bring Mongolia's biology teachers and students up to speed on ecology and environmental science and to do conservation work during summer breaks – her face grew darker and darker. At the end of my explanation, she snapped, "We know how to take care of our environment! You know, Chingis Khan made rules about protecting nature, and we still obey them. We don't need outsiders telling us what to do! What can you teach us, anyway?"

Children in the Altai Mountains, Uvs Aimag (province), Mongolia, summer 2001. This family provided horses for a week-long survey for snow leopard, argali, and ibex. (photo by R. Watters)

I stumbled over an explanation about science and modern conservation techniques, giving Chingis Khan his deserved due as a foresighted environmentalist but suggesting that there were some new concerns in the 800 years since his time; for example (and here I nodded towards the truck), water pollution. Norovobanzad shook her head and said that they knew not to pollute the river - Chingis Khan's laws prohibited putting blood, urine, or milk into the water, because that would offend the Losan Ezen, the water spirits, who might then drown the perpetrators in revenge. Before I could wrap my mind around what she'd just said, she went on to explain that Mongolians had taken care of their environment for thousands of years. She just did not believe that I, as an outsider, could know anything about conservation in the Land of Chingis Khan.

I realized at that moment that the next two years would require a versatility of thinking that had never before been asked of me, because Norovobanzad was right. I had a stock of facts and figures and techniques and equations and theories, but I would never know the land the way the Mongolians did. Nor would I ever fully understand the spiritual and historical maps that guided so much of their behavior; the Losan Ezen, ever ready to reach up and drag the unwary offender down; the sanctity of springs and of certain mountain peaks; the fact that blood or urine were worse pollutants than motor oil; the way that anything Chingis Khan had done was considered fair precedent for modern behavior, whether that involved protecting nature reserves, or hunting certain species to the brink of extinction; the way that the mountain spirits might require a man to kill a snow leopard or a wolf as an offering, even though these animals were also manifestations of spiritual power.

I had traveled halfway around the world to ask people to think more like I did, but by the time I left, I had changed as much – perhaps more – than anyone I had interacted with.

However enchanted I had been by ideas like island biogeography, overgrazing, biodiversity, population ge-

netics, carrying capacity, and sustainable development, I left Mongolia understanding that if I'd chosen to stick to those ideas only – as some of my fellow Peace Corps environmental volunteers did – I would have gotten nowhere. Only when I was able to fluently talk about Chingis' laws and the strictures of the Losan Ezen were the Mongolians willing to listen in return. And a secret confession: by the time I left, I felt the same reverence for the peaks, the springs, and the rivers that my students did. I left three stones as an offering for the spirits whenever I came across one of their shrines, and when the town shaman talked about the power of owls to make a baby sick, I didn't scoff; it seemed reasonable to me. In return, my Mongolian counterparts and students mastered an incredible amount of information about Western approaches to ecology and conservation.

Puruvnambar, artist, and his daughter at the 2001 Nadaam festival, Kharkhorin, Mongolia. Purevee and his family were some of my closest friends in Kharkhorin. He painted all the sacred paintings for the Buddhist monastery. (photo by R. Watters)

I promptly forgot much of the value of this lesson in cooperation and mutual open-mindedness when I returned to the U.S. to work on my master's degree in environmental science. My research focused on conflicts surrounding the wolf reintroduction in Wyoming, and I was perplexed by the acrimony surrounding the issues. I wasn't prepared to be anywhere near as lenient with my fellow Americans as I was with people on the other side of the world, nor was I prepared to be as lenient with myself in an American context. We all had access to the same scientific information, we shared a nationality and, nominally, a culture, and it seemed reasonable that, guided by the laws of logic and rational thinking, we should all be capable of arriving at the same conclusions about the necessity of protecting nature and wildlife while looking for a way to keep ranching viable. Instead, everyone seemed to dislike and distrust anyone who didn't agree with extreme and absolute positions.

Courtney White's question at the beginning of the Quivira Conference brought the lesson of Norovobanzad's indignation on the banks of the Orhon vividly back for the first time since I'd left Mongolia. To create a sustainable world, we first have to find strategies for resilience – and the first step is recognizing the value of diverse ideas, perspectives, and ways of knowledge.

Sustainability has been the mantra of the development and environmental communities for the past two decades, but academia and major development agencies struggle to define the concept. Something in the human psyche, at least the western psyche, is drawn towards absolutes, and the quest for sustainable solutions to environmental and development challenges has often been couched in terms of a single cure-all.

Environmental historian William Cronon, speaking at the Yale School of Forestry and Environmental Studies in spring of 2007, mentioned the environmental movement's gravitation towards narratives of crisis, and to corresponding "final solutions" to those crises. Into the silence that came after the utterance of these words, Cronon added that he used the phrase in full awareness of its obscenity. A monopoly on solutions, a lack of options, imagination, and diversity of ideas was as dangerous, he implied, as climate change or loss of biodiversity – or fascist government. He implored us to look beyond the quest for a single answer, and entertain the notion that there were many potential paths to a better future.

He spoke to the core problem with the idea of sustainability. Sustainability is seen as some sort of plateau that can be reached through technology, management, and planning, and then maintained indefinitely. Yet history and ecology both tell us that systems – human or natural – don't maintain equilibrium for long. They are subject to perturbations and upsets of different kinds, and the system must be flexible in order to recover from shocks. This is where resiliency picks up sustainability's unraveled threads. Without resilience, there is no sustainability, because a rigid system of management – a single solution - will never be

able to respond to the fluctuations of nature, society, culture, or the economy. A system with multiple options, on the other hand, is much more likely to survive disruptions.

Building resilience is the art of weaving diverse possibilities to create a viable whole.

But resilience is a harder concept to hold in one's head than a single-solution answer. Humans are naturally resilient – we would never have survived as a species if we weren't - but apparently less capable of *understanding* how this de facto resilience interacts with the surrounding environment and with other cultures. Human resilience frequently manifests itself over generational timescales; ecological resilience often takes even longer, which may be one reason that the issue of resilience has been relatively invisible.

Humans want something immediate, something that we can see and touch, to illustrate abstract ideas and timescales. It takes conscious effort and concrete demonstrations to begin to perceive the idea and its implications.

The 2008 Quivira conference was convened in an attempt to make the idea of resilience tangible. On the first day of the conference, Lance Gunderson of Emory University summarized the academic underpinnings of the resilience concept – engineering vs. ecological resilience, alternate stable states, losses of functional diversity, the increasing scale of human impacts. The information provided a thorough introduction to resilience, but the real-world examples offered by conference speakers and attendees brought the ideas vividly to life.

2008 Quivira Coalition Conference attendees.

Dr. Eric Blinman of the University of New Mexico charted the 2000-year history of human adaptation to climate change in the southwestern United States. Michel Meuret talked about the struggle of French shepherds to maintain their lifestyle and conserve the landscape of the mountainous regions of France. Jay Begay Jr. explored the history of the Churro sheep among the Navajo; the traditional breed has had three close brushes with extinction, paralleling difficult times in Navajo history, but the Navajo have successfully nursed the sheep back to viability and kept the animal a part of their lives and weaving. Colleen Biakeddy and Roy Kady shared the spiritual underpinnings of the Navajo relationship with the Churro, the way the sheep was created of cloud and willow and rainbow and rock crystal and plants, with a face made of dawn; the way in which the beauty of the sheep was expressed in the art of Navajo weaving and in the very way that Navajo live their lives.

Workshops on water conservation and sustainable ranching techniques offered practical strategies for building resilience and moving towards sustainability. Grass-fed beef from several New Mexico ranches graced the tables at mealtime, illustrating the commitment to living the ideals under discussion. Woven between and among the speakers were the conference attendees - ranchers, environmentalists, scientists, government employees, artists, cowboys, consultants, students, seething with ideas, questions, and enthusiasm. The spirit of cooperation and the lack of hostility among these groups, which in other parts of the West seem destined to be in conflict with each other for eternity, was notable.

Keynote speaker, Kenyan conservationist Jonah Western, instrumental in the establishment of Amboseli National Park and in combating the illegal ivory trade during the 1980's and 1990's, highlighted ecological resilience in his discussion of the interactions of elephants and Maasai cattle on the drought-prone plains of the Maasai Mara. Maasai elder John Kamanga told the cultural side of the same story as he talked about the way his people were adapting to

the group ranch system set up by the Kenyan government. His efforts to create an ecotourism project on his group ranch in southern Kenya and to market Maasai livestock were two examples of the strategies of pastoralists in transition, seeking to integrate themselves into the mainstream economy on their own terms, in ways that preserve what they most value in their own culture.

As a college student in Kenya in 1997, I spent several weeks living with the Samburu, the Maasai's northern kin. There, my Samburu host father first introduced me to the idea of reciprocity. Pastoralists all over the world invariably live in arid or marginal areas that are subject to drought. Cultural resilience, and often the very survival of a community, relies on the willingness of individuals to help each other out when times are difficult. A family that is rich in livestock one year may be able to give cows to another family that has lost most of their herd, on the understanding that when the rains fail next time, the favor will be returned if necessary.

Avery Anderson, John Kamanga, and Rebecca Watters at the 2008 Quivira Coalition Conference.

Both Jonah Western and John Kamanga talked about the importance of reciprocity among the Maasai, the give and take that allows people to know that they can rely on each other and that they are all engaged in the same effort to survive. It is the basis of cultural resilience among the Maasai, Samburu, and other African pastoralist groups, and this principle holds true among the Mongolians as well.

Reciprocity is not always an easy concept, particularly for people raised with strong notions of privacy and private property rights. In Mongolia, reciprocity came into play with everything from test-taking (the correct answer was communal property in the classroom, no matter how often students were told not to "cheat") to sharing meals. I was delighted to be asked to dinner at my students' homes, but I quickly discovered that this meant five or six of them were going to show up at my place each day to peruse my book collection, try out their tentative English, and cautiously nibble food from the care packages that my mother sent (a brush with wasabi peas put an end to the latter activity; Mongolians are not adventurous eaters.)

It wasn't long before I figured out that accepting anything from the unfailingly generous and hospitable Mongolians was equivalent to putting myself under an obligation – and that giving anything *also* put me under an obligation to accept help in the future. At first this bothered me; I valued my independence too much, and I didn't have anyone like Norovobanzad to tell me that what it really meant was that I had become a part of the community.

Jonah Western referred to reciprocity as part of a system of "layering and latticing," an image of strength within the community that brought to mind the work of Navajo weavers and conference speakers Roy Kady and Jay Begay Jr., carefully woven to insure the strength of the piece and the survival of an important work of art. Communities also require careful weaving in order to hold together, and the American West, at least in some places, seems distinctly unraveled. There is frequently too little trust, and no one is willing to put themselves under obligation to someone from a different background. The fabled cowboy independence of the American West, the intellectual self-sufficiency of science and academia, have prevented us from truly becoming a community. We have no obligations to each other, and we don't want them, either.

But on the last day of the Quivira conference, John Kamanga in his beaded Maasai elder's outfit chatted with ranchers in leather vests and big-buckled belts, cowboy hats and boots. Somewhere over the course of the day, John acquired a cowboy hat of his own, so that, between the hat and the purple robe and his very

English shoes and socks, he seemed a visual representation of what happens when we start listening to each other and openly exchanging ideas. It occurred to me then that there are different kinds of reciprocity – intellectual as well as material. I remembered the way that my students and fellow teachers in Mongolia had begun enthusiastically exploring western ideas about conservation only after I'd shown them that I'd accepted the gift they were giving me in sharing their own history and perspectives.

And once people at the conference began to talk, the common themes were surprising; Maasai, French, and Western ranchers alike were facing issues of subdivision, for example. Subdivision on the plains of Africa seemed inconceivable, and yet it was true. Intellectual reciprocity is an important tool for building a sense of community, but it's also vital to recognizing that certain problems are universal, and that sharing strategies for solving these problems helps build resilience. Open-mindedness and a willingness to listen are essential.

Many environmental or development initiatives are well planned and well executed, but many others are not. Even with a commitment to sustainability, it is too easy to begin a project in the belief that you are bringing everything you need with you. This is especially true if you are working with a population that is culturally different from your own. And it is important to remember that "culture" is a tricky concept – being a liberal Boston-bred vegetarian is *not* the same as being a Western rancher or forester, even if we share the same nationality.

Jonah Western, in his book *In the Dust of Kilimanjaro*, relates his early frustrating encounters with the Maasai, who were widely perceived as a threat to the Kenyan national park system and wildlife. Western considered himself open-minded, but it wasn't until his Maasai friends gave him two cows and asked him to follow them, to learn to look at the ecosystem "with the eyes of a cow," that he began to truly understand the dynamics of the system and see things that his scientific colleagues had missed – including the fact that the Maasai and their cattle were not a threat to the wildlife, but were an essential part of the vegetation dynamics of the ecosystem.

Although no one ever gave me livestock during my time in Mongolia, Norovobanzad managed to show me the necessity of looking through someone else's eyes, and my students taught me the value of reciprocity. I was lucky that it happened so close to the beginning of my time in the country. I learned early that what I brought with me wasn't enough. Only through intellectual and cultural reciprocity were we able to generate ideas and move a step closer to solving problems.

After two and a half years talking to people about carnivores in the West, I came to the Quivira conference feeling as if I'd hit a wall. I could talk to ranchers and understand their perspective. I could talk to environmentalists and understand their perspective. Everyone had the best intentions and everyone was trying to do the best work that he or she could. But the reciprocity was missing; everyone seemed so entrenched - and entrenchment is, of course, an impediment to resilience.

The Quivira conference seemed like a magnet for all the people who really do believe in intellectual reciprocity, and who are willing to be part of the weaving of resilience and sustainability. I left the conference refreshed, inspired, and, for the first time, looking forward to working in the West after graduation. As for open-mindedness, reciprocity, and resilience – if anyone wants to offer me a couple of cows to follow around the range, I'd be delighted to accept.

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The Break of Day

$7 Gas and the New West

by Courtney White

"We are not walking a prepared path." – Wendell Berry at The Quivira Coalition's 6th Annual Conference, in response to a question about the difficulties that lie ahead.

During the spike in gasoline prices in the summer of 2006, our Congressional Representative, Tom Udall, warned a newspaper reporter that one day we would be "wistful about $3-a-gallon-gas."

Filling up my gas tank the other day in Santa Fe, New Mexico, and paying $3.49 a gallon for the privilege, I thought "Hey, I'm *already* wistful about $3 gas!" I just didn't think I would be so wistful *so fast*.

I had better get used to the feeling. All indicators suggest that gas prices are heading in only one direction – up. Perhaps *way up*. The reason is simple to explain, but hard to digest: the global supply of oil cannot keep pace with demand. Worse, supply may "peak" soon (if it hasn't already) and thus begin an inexorable decline.

And with no "Plan B" in sight, this decline in oil production has serious implications for all of us.

Lonely Nevada highway. (photo by C. White)

What, for example, might $7 gas mean for the American West, where I live, with its dependence on tourism, its embrace of urban and exurban sprawl, its extraordinary bounty of natural resources, its aridity, and its long distances? The answer, I suspect, is this: we're going to be wistful about more than just $3 gas.

Our nostalgia will include the current version of the so-called 'New West,' whose many luxuries and benefits are dependent on cheap fossil fuel. I say "so-called" because there have been many "new" Wests over the past two hundred years, each as fresh and fleeting as the previous one. This shouldn't be news – history moves in periods, ages, eras, and epochs, one giving way to the next, sometimes quickly. Few understand this better than westerners, who have learned the hard way that change is inevitable – as are the inevitable laments.

In his memoir, *A Walk Toward Oregon*, noted historian Alvin Josephy, Jr. quotes the famous western artist Frederic Remington in 1902 mourning the passing of the 'Old West' and the arrival of something new: "I knew the wild riders and the vacant land were about to vanish forever," said Remington. "I saw the living, breathing end of three American centuries of smoke and dust and sweat, and now I see quite another thing where it all took place, but does not appeal to me."

Josephy is sympathetic – but only up to a point. "As a historian of the American West, I also knew that, before and after Remington, each generation in the West had lamented in its own way the passing of its Old West."

The original Old West of the Native Americans was replaced by a New West of missionaries and mountain men. That West was replaced by the brave new frontier of miners and soldiers; which gave way to homesteaders, farmers, ranchers, capitalists, doctors, city folk and so on. The next New West included artists, movie stars, dudes, automobiles, picnickers, oil men, and land speculators. Next up were bureaucrats,

environmentalists, backpackers, migrant workers, Land Rovers, latte and, well, more land speculators (I'm filling in for Josephy here).

His point is this: every New West eventually becomes an Old West which is replaced in turn by something new, whether we like it or not.

It happened to Josephy as well. "The Old West that I had experienced was now gone too," he wrote, "changed by industrial and military centers, interstate highways, recreation developments, trophy ranches and urban sprawl, conformity, high-tech pop culture, television, and economically stressed cattle and lumber operations struggling to survive against global competitors."

"Components," he concludes, "that will become someone else's Old West."

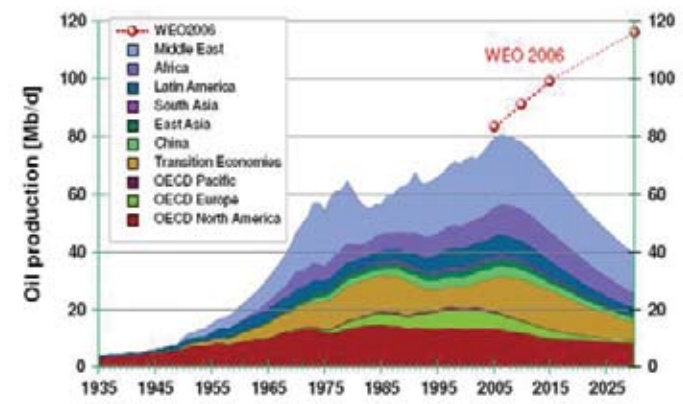

Chart of projected global oil production. The ascending line (in red) represents projected oil demand. From a lecture by oil industry expert Matt Simmons (see www. www.simmonsco-intl.com)

This historical page-turning is upon us, I believe, and it has big implications for conservation. Think of where the movement was a century ago – think of John Muir and his fights for national park protection and his struggles against dams and other destructive examples of a rapidly urbanizing nation. Think of Teddy Roosevelt burning the midnight oil with Gifford Pinchot, the head of the newly minted U.S. Forest Service, to create fresh forest reserves against the wishes of loggers, ranchers, and miners.

Fast-forward to where conservation is today and how much it has changed to meet evolving times. Now contemplate about where it might go in a 21st century that is shaping up to be quite different than the 20th.

A place to start is the effect $7 gas will have on the American West. This includes:

A Decline in Recreation-based Economic Activity. One of the early casualties of rising gas prices will be long-distance tourism – currently a mainstay of many economies. It's not just driving, higher airplane fares are inevitable as well. In fact, it's a safe bet to say that any tourist activity involving fossil fuel will become more costly, probably *much more* costly. Rural communities may stagger under the blow. This will have a big impact on conservation as well, which firmly hitched its wagon to recreation decades ago

The Juggernaut of Urban & Exurban Development Will Falter. Cheap gas begat our love affair with the automobile which begat suburban and exurban (ranchette) development which begat an intense period of economic prosperity all across the West. But what will $7 gas beget? Serious economic trouble in suburbia, I suspect. For conservation this will be a mixed blessing: a reduction in the rate of land fragmentation could be a relief, but economic turmoil could dry up dollars (and members) for conservation efforts.

Water Will Become More Expensive: In the arid West, water is our life source. In fact, much of western history revolves around water, especially the availability of cheap (i.e. subsidized) water for expanded agriculture, new homes, new cities, and endless growth. But much of this water is dependent on fossil fuels for its pumping and delivery. Rising energy costs mean higher water costs, which, combined with water's increasing scarcity, raises the likelihood of additional economic and ecological turmoil ahead.

Economic Hardship Will Spread Upward: As the basic necessities of life – food, energy, and water – become more expensive, the economic pain will be felt among the poor and disadvantaged first and hardest. Consequences could range from increased crime and social unrest to questions about how to keep farmers and ranchers in business producing local food when diesel prices shoot through the roof. Against this backdrop of rising economic hardship, current conservation priorities will have to be redefined.

There's more. Rising energy prices are just one consequence of a century of frenzied industrial

economic activity. There are others, as daily news reports remind us. Soon, all of these rising concerns will merge into a general sustainability crisis, I believe, requiring a new response from the conservation movement altogether.

Age of Consequences

Although no one knows what the decades ahead will bring precisely, there are enough indicators available to say with confidence that the 21st century will look a lot different than the 20th. Whether the concern is climate change, peak oil, overpopulation, species extinction, food and water shortages, or something else, the challenges ahead are daunting and varied.

These are all elements of what I call the *Age of Consequences* – the era in which we, and subsequent generations, are required to grapple with the cumulative effects of two hundred years of full-throttle industrialism. It's not just about damaging industrial products, such as greenhouse gases or toxic wastes, but damaging decisions also. Action has consequences, of course, but so does *inaction*, which largely describes our collective response so far. We can see trouble brewing – but we hesitate to react with corresponding urgency.

Hurricane Katrina, August 29, 2005. (hoto from http://www.nasa.gov/vision/earth/lookingatearth/h2005_katrina.html)

Metaphorically, I think of the Age of Consequences as a hurricane that has been building slowly over open water for some time but is now approaching shore. We can already feel its winds. We don't know precisely where the bulk of the hurricane will make landfall or how strong its winds will be ultimately, but we do know that it *will* strike and that its destructive power will be awesome.

A strenuous effort must be made to lower the wind speed of this hurricane as much as possible – such as reducing the amount of greenhouse gases entering the atmosphere or preserving biologically rich natural areas from industrial development. This is an appropriate and important job for the current iteration of conservation movement. However, since the hurricane is destined to make landfall no matter what we do, it also means new work for conservationists – the next turning of the page for the movement.

Specifically, I believe there are three areas that are paramount:

1) Reversing Ecosystem Service Decline. In 2005, the United Nations published its *Millennium Ecosystem Assessment*, a global evaluation of the ecosystem services on which human well-being vitally depends. These services include food, fresh water, wood, fiber, fuel, and biodiversity; climate, flood, pest and disease regulation; nutrient cycling, soil stability, biotic integrity, watershed function, and photosynthesis; and spiritual, educational, recreational, and aesthetic experiences.

The ultimate conclusion of the Assessment is this: globally, ecosystem services are in decline – in some places rapidly – and as they decline so will human well-being.

This means traditional conservation concerns, such as wilderness protection, parks, and recreational experiences, will fall in priority. That's because as human well-being degrades, conservation strategies that don't actively aim at reversing ecosystem service decline will become less and less important as basic human needs, such as meeting food and energy requirements, rise in importance.

The Assessment's authors encourage active adaptive management of natural resources, including restoration, monitoring and experimentation with new management methods – all with the goal, in their words, of maintaining ecological "diversity, functional groups, and trophic levels while mitigating chronic stress [in order to] increase the supply and resilience of ecosystem services and decrease the risk of large losses of ecosystem services."

In other words, to improve human well-being, we must roll up our sleeves and get busy with the big job of *managing* the planet according to ecological limitations.

2) Creating Sustainable Prosperity. The conservation movement has been slow to recognize that environmental problems are at heart economic problems. Ecosystem services, for instance, are declining largely because their conservation value is not seen to be in the economic self-interest of important portions of society (abetted by cheap fossil fuel). As a result, conservation became primarily a subsidized activity, accomplishing its goals principally by (1) direct or indirect governmental funding; (2) as a byproduct of commercial agricultural activity; or (3) by philanthropy; or some combination of each.

Conservation remains subsidized to this day for a variety of reasons, including its high cost. Another reason is a well-founded concern about the role uninhibited market forces play in the overexploitation of natural resources – a role that has contributed widely to ecosystem service decline around the planet.

Stream restoration specialist Bill Zeedyk describing how a post vane protects an eroding bank. Comanche Creek, Valle Vidal, NM. July 2007.

But can conservation pay for itself ultimately? If it can not, at least at some significant level, then the objective of reversing the decline of the ecosystem services on which human well-being depends might be impossible. *That's because more than a century of conservation work has demonstrated the limitations of subsidized incentives (case in point: the current condition of the planet)*. Additionally, the scale of the conservation job continues to grow, especially as ecosystems decline, which means the cost of restoration will grow as well.

More to the point, even if conservation can be profitable, can it be sustainable – in other words, can it be *prosperous over time?* There are no easy answers to these questions, though for inspiration we can look to the growing number of family-scale, progressive and indigenous ranchers and farmers around the world who have succeeded, to one degree or another, by working on the original solar power – photosynthesis. Many have been profitable and sustainable simultaneously, and often for the same reason, thus prospering in multiple ways, and not just economically. We could learn a great deal from their examples.

3) Relocalization. This word will likely dominate the upcoming decades. The inevitability of rising energy costs means more and more of our daily lives, from food production to where we work and play, will be lived closer to home at local and regional scales. This won't be by choice, as it is currently, but by necessity.

The key is to look at relocalization as an opportunity, not just a challenge. It can be a form of rediscovery – learning about our roots, about community, neighbors, gardens, and doing with less in general. One could even look at relocalization entrepreneurially – those individuals and organizations that get into the game early, by providing re-localized goods and services, will stand a very good chance at a profitable living as the transition begins to unfold.

Relocalization includes:

The Development of Local Food and Energy Sources: Working landscapes will become critical again. So will the innovations currently taking place at the nexus of agriculture and ecology – a nexus that requires working lands. This is not to dismiss wilderness or the needs of wildlife, but it does mean concentrating our efforts on answering an important question: could New Mexico feed itself? Could Montana? Or France? And if not, why not, and what can we do to stimulate local food and energy production?

Farm and Ranch Land Will Become Important Again – So Will Farmers and Ranchers. Local food and energy, as well as recreational opportunities, require local land that is available for these uses. We'll need local people to do this work too, as well as their local knowledge. This means figuring out how – now – to keep the current generation of farmers and ranchers on the land, as well as encourage the next generation to stay, come back, or give agriculture a try.

Restoration Will Become An Important Business. Producing local food and energy from working land-

scapes, especially in quantity, will require healthy land as well as best management practices that work 'within nature's model.' However, while the 'toolbox' of progressive stewardship is now well developed, a great deal of our land is in poor condition, for a variety of reasons, requiring restoration and remediation. The good news is that this work could afford local communities a bounty of jobs at good wages.

All of this work involves creating a "new path" – to paraphrase Wendell Berry – much of it agrarian in nature. Participation in its construction will require a new type of conservation effort, and probably a new type of conservation organization. While older 'models' of conservation are needed for the important job of slowing the Age of Consequences 'hurricane' down as much as possible, the work on the 'shore' requires a new model, one that has a different goal than conservation has aimed at in the past.

As a conservationist, as well as member of the human community, I'm no more a fan of change than anyone else. But the next time I fill up my truck at the gas station, I'll be reminded of how fleeting my 'New West' turned out to be. I'm not sure what will be coming next precisely, no one does. It's just coming, that's all. Maybe it'll be better – I guess it depends on your expectations. As for me, I'll climb back in my truck and keep working toward a more resilient future for as long as I can. It's the least I can do for my children.

The storm moving toward shore took a long time to develop – and it'll take an even longer time to dissipate. Our primary duty, therefore, is to be patient, to work dutifully and thoughtfully. Building resilience will take time. It will also require skill, collaboration, and respect. To build a new path, we'll have to work together, and we'll have to do things differently. Fortunately, we have a great deal of raw material, some of it quite ancient, from around the planet from which to start.

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Courtney White with daughter Olivia at The Quivira Coalition's 2008 Annual Conference. (photo by Gene Peach)

Research

Local Beef: An Opportunity to Seize, part 1

By Sarah Laeng-Gilliatt

with professional contributions by Ken Meter, Crossroads Resource Center.

A Joint Project of The Quivira Coalition and the New Mexico Acequia Association

Editor's Note:

During the winter of 2006-2007, a major snow storm briefly shut down both Interstates that serve Albuquerque. A few weeks later, a local reporter wrote a story for his newspaper in which he asked: how long would it take for the food to disappear from the shelves of the city's grocery stores if both highways were closed indefinitely? His answer: six days.

His speculation caused us to wonder: how long could Santa Fe feed itself in an emergency? How much does Santa Fe eat? Where does its food come from? How many miles does it travel? Could Santa Fe feed itself solely from local sources? And if not, why not?

We decided to look into the question of Santa Fe's food resilience. We asked Sarah Laeng-Gilliatt to do the looking for us, tasking her with the questions: how much meat does Santa Fe eat and how much of it could be supplied from local producers? We also asked her to explore possible strategies that might increase the city's food security.

We thank Sarah for her diligence and thoughtfulness. We're sure you will enjoy her stimulating analysis – we did! Thanks too to the New Mexico Acequia Association for their support in this worthwhile project.

Part 2 of this article will be published in the next Journal.

Abstract

The focus of this article is on the local production and consumption of beef in the five county region of Santa Fe, Rio Arriba, Taos, Mora, and San Miguel. Beef is a critical part of the region's agriculture, with livestock and related products comprising 75% of the region's agricultural sales.[1] This essay: 1) Considers the inspiring research recently done by Ken Meter, a national leader in promoting the economic development benefits that can accompany the process of connecting local producers with local consumers. From examining government data, he tells us how much food people in the region consume and how much the region's farmers produce. His findings present a bleak picture: very little local food is being consumed by local people and many farmers are losing money and leaving the land; 2) Examines where cattle raised in New Mexico go, and where the beef consumed in New Mexico comes from; 3) Places these realities against the backdrop of climate change and peak oil which underscores the need to shift industrial food systems to more traditional, sustainable, and local systems. Here, taking up Ken Meter's work once again, his research becomes tremendously hopeful--it points to what might be possible if local people were to buy more from local farmers; 4) Asks what is meant by "local"; and, 5) profiles promising initiatives that "localize" food: the mobile matanza, a slaughtering unit that allows small scale ranchers to maintain their culture and land-based living in northern New Mexico; the freezer beef project[2] of La Montanita Coop's Foodshed Project;[3] and lastly, a range of initiatives being undertaken in Woodbury County, Iowa. The essay concludes with an analysis of themes highlighted by these efforts that characterize localizing in general–issues of size and scale, localizing as economic development, the need for investment in local infrastructure, and a policy climate supportive of strong local food systems.

The current state of the region's beef system

How is local agriculture faring? From 1940 to 2006, the number of farms in New Mexico decreased from 32,000 to 17,500. Specifically, what is the state of the economic health of farmers and ranchers in the five county region of Santa Fe, Rio Arriba, Taos, Mora, and San Miguel? In 2002, 70% of the region's farms and ranches reported net losses. The number of farms selling livestock fell 34% from 1997 to 2002, while sales dropped 17%. Though the financial losses of the region's farms have been particularly severe in recent years, with an average annual loss of $32 million dollars between 2001 and 2005, this is not an altogether new phenomenon–over the past 25 years, farmers have had an average loss of $14 million each year (18% of sales). [Each year, except 1993, ranchers and farmers have lost money because production costs have exceeded cash receipts, despite holding production costs at a steady level.] From 1981 through 2006, the region's farms have, on average, sold $77 million worth of crops and livestock each year. However, it has required $91 million to produce these commodities. Over this 25 year period there was a production loss of $350 million.

Valle Grande Ranch Cattle, Rowe, NM. (photo by C. Conley)

The decline of the farm economy is primarily due to the fall in cash receipts for livestock. Though cash income for crops has held steady at about $10 million per year since 1969, cash receipts for livestock from 1969 to 2006 fell $72 million (64%) from $114 million to $41 million. According to Ken Meter, the sharp decline in the livestock economy is primarily due to two factors–the price ranchers receive for their cattle decreasing, and a steady drop in the number of cattle. With the price per unit declining, many people cannot afford to raise cattle anymore.

In such a climate, would it be possible for Santa Fe to provide for its own beef needs? In 2002, there were 10,961 head of cattle in Santa Fe County and 98,999 in the five county region (these are end of year numbers, so there are actually more moving through the economy when you consider the entire year). In 2005, Santa Fe County residents spent $11.6 million on beef, and $20.7 million throughout the four county region. Given that the average cost of beef in 2006 was $3.61 per pound,[4] this means Santa Fe County consumed approximately 5,918 head (for every 1,000 pound animal, approximately 543 pounds are edible), while the region consumed approximately 10,561 head.[5] In theory, Santa Fe is producing 185% of its demand, while the region produces 940% of its need.[6]

After local consumption, local ranchers could continue to export beef, particularly the region's surplus beef. Efforts could be made to keep much export beef processing in New Mexico, as well as to do interstate trade with regions that are attempting to localize what they are able to produce. New Mexican beef could also be exported via domestic fair trade channels as well.[7]

According to a U.S. Department of Agriculture 2005 report, New Mexico is the country's hungriest state–with 16.8% of the state, or approximately 319,200 people, food insecure.[8] This is all the more dire in the current climate of increasing food prices– up 5% in 2007 and it appears the that the era of "cheap" food is ending.[9]

Where do northern New Mexico's cattle go? Where does the beef consumed in Santa Fe come from?

Most cattle raised in New Mexico are not sold locally, but rather enter the centralized commodity system. The cow-calf part of the beef production process is the only aspect that does not lend itself to industrialization: relatively large expanses of land are required with individual attention given to details that are often unique to each operation. For example, feeder cattle are sold at auction in Roswell, Belen, or Clovis and then often go to north-eastern New Mexico for six months as

What a dollar spent on food paid for in 2000 (graphic reproduced from Figure 2-2, page 21 of Agricultural Fact Book 2001-2002).

stockers. Then they might go to feedlots in Texas or the Midwest. Large packers have operations focused around Amarillo, Texas, so the bulk of New Mexico's production is processed there, and then is distributed back out through retail grocery stores.

If predominantly not from local sources, where does the beef consumed in Santa Fe come from? This seemingly simple question defies any certitude. To answer this question, interviews were held with five local grocery stores–La Montanita Coop, El Paisano, Kaune's, Whole Foods and a very large, chain purveyor who wished to remain anonymous. La Montanita Coop has long been committed to supporting local meat producers and buys two cattle weekly from Canadian River Ranch in Roy, New Mexico. The animals are slaughtered in Moriarty at Western Way Custom Meats, and processed by Geno Garcia, a butcher at the Coop who trains young men in the art of butchering. El Paisano buys very limited amounts of beef from Albuquerque, but the bulk of the beef they sell comes from Excel Corporation and National Beef. Excel is the third largest meat packer in the country, and is a subsidiary of Cargill Inc., which is a leading grain merchant and the leader in animal feed. National Beef is the fourth largest meat packer in the country. El Paisano buys week by week from the company that is the least expensive. Kaune's Market buys from the distributor Shamrock which aquires their beef from Harris Ranch Companies based in Coalinga, California. They are currently in the process of investigating local beef to sell at their market, as they are very happy with the local lamb they sell, and want to promote New Mexico's livestock producers. The Whole Foods regional headquarters in Colorado orders the majority of the beef that they sell in Santa Fe from a ranching cooperative called Country Natural Beef with ranches in Colorado, Wyoming, New Mexico, and seven other states. The large chain store that wishes to remain anonymous buys from IBP, Excel, and National–depending on who has the best price.

Learning the companies with whom Santa Fe stores do business, it is still difficult to deduce where the beef came from, how many miles it traveled from ranch to plate, or where or how the cattle were raised, slaughtered, and processed. Will Pape, a grassfed beef rancher himself, has looked into these questions and has estimated typical food miles involved in beef coming to a Wal-Mart for retail in Santa Fe. His scenario shows how a steer could likely make the following trip:

1. born in Columbus, Georgia;
2. sent to an auction market in Nashville, Tennessee;
3. shipped to a grass stocker in Jackson, Missouri;
4. then on to an auction market in Joplin, Montana;
5. then to a feedlot in Osceola, Iowa;
6. on to a slaughter facility in Omaha, Nebraska
7. cut and packaged in Amarillo, Texas;
8. sorted at the Wal-Mart distribution center in Plano, Texas; and
9. finally stopping in Santa Fe to be sold.

Will did the math for a *trip total of 3,560 miles.* He then commented that the transportation numbers are probably actually "close to double" that figure since, "the more specialized a truck is to haul just one thing, the more likely it is going to go back empty, which is called 'deadheading' or 'empty miles."[10]

Though knowing the true origins of Santa Fe's beef is difficult, one can be heartened by the rapidly growing interest people have regarding the origins of their food. There is an inspiring piece of legislation in Minnesota -- a state-of-origin labeling law.[11] Perhaps this could be replicated in New Mexico.

What if the region's consumers bought more locally produced beef?

Ken Meter's summary of the farm and food economy of northern New Mexico shows that consumers in the five-county region buy $592 million of food each year. Over $329 million of this is food eaten at home, and another $262 million is eaten away from home. Little of this food is sourced from northern New Mexico farms, with only $924,000 of food items being sold directly from farmers to consumers, amounting to less than two percent of total farm sales. While detailed data are not available that shows exactly how much food residents consume is brought in from outside the region, Meter's conservative estimate would be between $400 million and $550 million, or more.

Meanwhile, Meter's data shows farmers lose money producing commodities for distant markets. Moreover, most farm inputs are sourced outside of the region, which means farmers spend $45 million each year buying inputs that are sourced far away.

All told, when consumer food purchases, farm losses, and farm input expenditures are totaled, the region ships more than *$460 million each year away from northern New Mexico*. This is six times the value of all food commodities now produced by the region's farmers and ranchers.

These losses nevertheless represent an opportunity. If northern New Mexico consumers bought 15% of their food directly from farmers, it would bring $49 million of new farm income into the region. This is nearly half of farmers' production costs, and would cover their annual losses three times over. This total is fourteen times the current subsidies now granted the region's farmers from the federal government.

The growing need for resilience

Our industrial food system is built on fossil fuel. In Martin Heller and Gregory Keoleian's report "Life Cycle-Based Sustainability Indicators for Assessment of the U.S. Food System," the Center for Sustainable Systems calculates that the U.S. food system requires 7.3 units of fossil fuel energy to produce just one unit of food energy: 12% for production, 8% for chemical fertilizers and pesticides, 15% for transportation, 35% for processing, packaging, retail, and commercial food service, and 30% for in-home storage and meal preparation.[12] However, the price of oil is at an all-time high, having just reached $110 a barrel.

Though the causes for the increasing cost of oil are often attributed to geopolitical volatility in the Middle East, Latin American governments taking control of their oil industries, increasing dependence on Russia, and other causes, all of which could possibly be mitigated through politics or economics, the geological limits on oil are impervious to such influences. In particular, peak oil, that is, the point at which half of the total oil known to exist has been used, and beyond which extraction goes into irreversible decline and becomes increasingly costly to extract, is imminent (if it hasn't already occurred).

Cattle raised on irrigated pasture, Sandia Pueblo, New Mexico. (photo by C. White)

Nor is peak oil temporary. As the US Office of Petroleum Reserves wrote in a report for the US government, "World oil reserves are being depleted three times as fast as they are being discovered. Oil is being

produced from past discoveries, but they are not being replaced. The disparity between increasing production and declining discoveries can only have one outcome: a practical limit will be reached and future supply to meet conventional oil demand will not be available." [13]

The good news is that our industrialized methods of food production are not the only way to provide for our dietary needs. According to a report from a Minister of the European Parliament, Caroline Lucas, together with Andy Jones and Colin Hines, industrialized farming uses 50 times more energy input than traditional farming. [14]

Climate change will also force us to radically change our agricultural system both from an industrialized one to a more sustainable and traditional type as well as to a more localized one. Currently, agriculture is responsible for 25% of the world's carbon dioxide emissions, 60% of methane gas emissions, and 80% of nitrous oxide, these being the three leading greenhouse gases. [15] But much hope comes from research from the Leopold Center for Sustainable Agriculture's report, "Food, Fuel, and Freeways: An Iowa Perspective on How Far Food Travels, Fuel Usage, and Greenhouse Gas Emissions" that explains that if people in Iowa bought just 10 percent more of their food from within Iowa, they could together save 7.9 million pounds of carbon dioxide emissions a year. [16]

Furthermore, recent research from the Rodale Institute and elsewhere shows that organic agriculture can play a significant role in capturing atmospheric carbon dioxide and incorporating it into the soil, whereas conventional farming worsens the greenhouse effect by creating a net release of carbon into the atmosphere. In 2007, New Mexico had over 100,000 acres of land in organic production (up from 40,000 acres in 2005), of which 65,000 acres was pasture rangeland (35,000 acres in 2005).[17] Since New Mexican soils, rainfall patterns, and other characteristics differ from those in Pennsylvania where the Rodale Institute is located, it would be highly informative to do similar research here.

Agriculture not only contributes to climate change; it is also a victim. Though globally we can expect both benefits (enhanced carbon dioxide assimilation, longer growing seasons and increased rainfall) from global warming, as well as detriments to agriculture (more frequent and severe droughts, heat stress, faster growth, rising sea levels, and increased flooding and salinization), overall, according to many researchers, food production will likely be impacted negatively by climate change. [18] We will certainly have to learn how to grow food under increasingly challenging conditions. Scientists predict that we can expect a seawater rise of up to 88 centimeters this century affecting approximately 30% of the world's agricultural lands. [19]

A rather conservative study from William Cline at the Center for Global Development, discussed at the recent United Nations Food and Agriculture Organization's (FAO) Special Session on Climate Change and World Food Security, predicts that if current trends were to continue, global agricultural production capacity could fall from 5-20% globally by the 2080's, with many regions well exceeding these numbers. [20]

Given the confluence of these events, change is certainly upon us, and strategies to increase local resilience will, undoubtedly, become more important. Fortunately, the very things that will help people to be adaptable in the face of these changes–strong and sustainable local food systems and a high degree of local self-reliance–are often the very characteristics that are necessary to mitigate these problems. Here in New Mexico, we are fortunate to have strong Indo-Hispano agricultural practices that provide sustainable alternatives to the more mainstream agriculture that is practiced in much of the U.S.

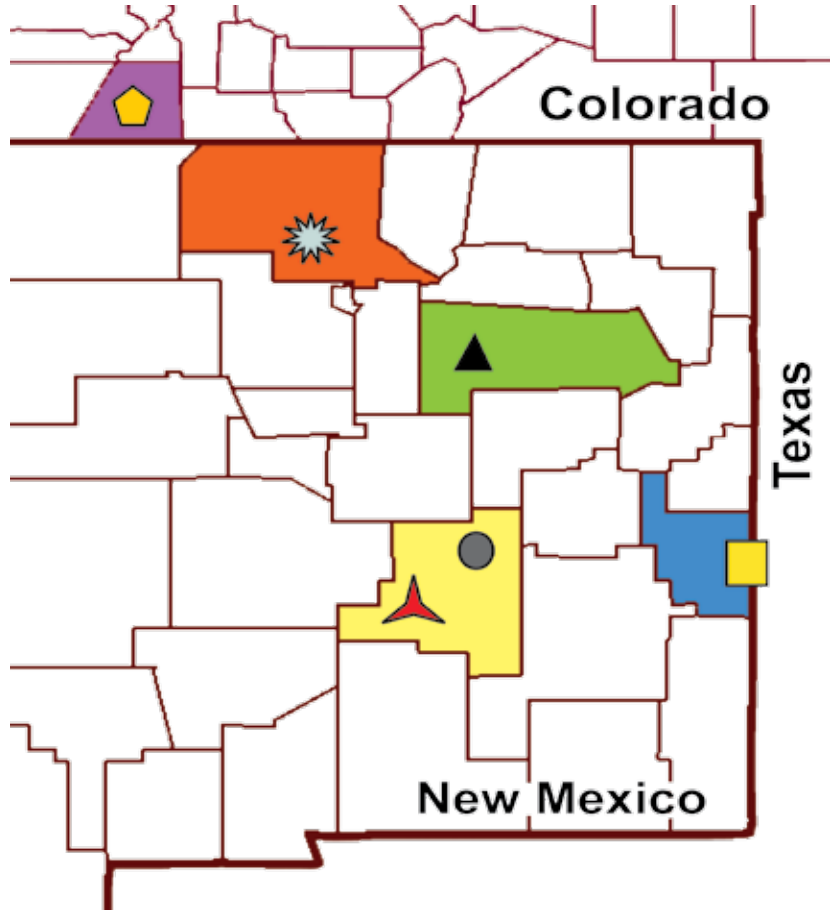
Going local

There are many positive signs the world over that local communities are finding their particular regional identities, strengths, cultures, art forms, recipes, and traditional practices. Though economic departments at universities tend to present only the neo-classical model of economics and though many economic systems have been stressed under pressures of economic globalization, many people are celebrating the tremendous diversity of local economic systems–numerous different configurations of and relationships between the private, public, non-profit, and informal sectors, and/or various ways of interfacing between privately

and commonly-owned resources. Indeed, future resilience may depend on protecting a diversity of economic forms.

In New Mexico, we are fortunate to have a couple of models which combine common and private ownership through the acequia and land grant systems, though these systems are under pressures from land and water privatization, private property law, and development. Locally in New Mexico and around the world, civil society is celebrating and building economic diversity -- as the Zapatistas in Mexico say, "seeking a world that contains many worlds".

Answering the question, "What is Local?" should reflect the diversity of each and every ecosystem and culture. Richard Douthwaite speaks of mimicking the radius of local newspapers, reflecting the natural connections that often exist between culture and economy. In Italy, some like to think of local as mirroring the distance that the church bells' clatter carries–this example reflecting and strengthening the natural connection between spirituality–love of place and nurturance of soul–with food and the material, economic world that nurtures flesh and blood. [21]



A sample of local grassfed beef producers in New Mexico and Colorado. For a list of other producers, visit the Southwest Grassfed Livestock Alliance web site: www.swgla.org.

The Foodshed Project of La Montanita Coop has defined local as a 300-mile radius. The mobile matanza operates within a 100-mile radius. Each initiative decides what is practical for them. These considerations have many dimensions–time available for distribution, ecosystem characteristics and how these impact the diversity of crops that can be grown, money available for fuel for transport, number of farmers that need to be reached, and so forth.

Is 100% local self-reliance practical or even a desirable goal? Probably not. Instead, an optimal system is one that does not so privilege trade that it undermines vibrant and healthy local food economies. The notion of subsidiarity is crucial - that is, what can be produced locally should be. Every effort should be made to produce staple, everyday items locally. As an idea, each region would decide what specialty items to import, to buy from as close to home as possible or within the domestic fair trade network that is developing in the U.S., or if not, then from international fair trade companies.

When trade does take place, our economic system would be set up in a way that pricing adequately

reflects real and multidimensional costs involved in trade–internalizing, for example, the ecological costs of transport. Given the change that is sure to characterize the future, these systems would need to be especially flexible and responsive. We need to expect ecological perturbations, drought for example, and be prepared at times to import more than we do at other times. We need to have "ecological savings" as it were, so that our usual import ratio leaves some slack for those times in which we may need to import more, for whatever reason.

To a great extent, this is the vision of the global movement for "food sovereignty." Via Campesina, an international network of peasant organizations around the world, coined the term when they put forward the notion of "food sovereignty" at the 1996 World Food Summit, and it has resonated with civil society around the world. Now, many organizations are coalescing around a very coherent and sophisticated agenda for food sovereignty, which they define as "the right of peoples to define their own food and agriculture; to protect and regulate domestic agricultural production and trade in order to achieve sustainable development objectives; to determine the extent to which they want to be self-reliant; [and] to restrict the dumping of products in their markets . . . Food sovereignty does not negate trade, but rather, it promotes the formulation of trade policies and practices that serve the rights of people to safe, healthy and ecologically sustainable production." [22]

This movement is gaining momentum. According to the Declaration of Nyeleni, in February, 2007, "more than 500 representatives from more than 80 countries, including peasants/family farmers, artisanal fisherfolk, indigenous peoples, landless peoples, rural workers, migrants, pastoralists, forest communities, women, youth, consumers and environmental and urban movements gathered together in the village of Nyeleni in Selingue, Mali to strengthen a global movement for food sovereignty." [23]

[To be continued in the next Journal (#33)]

Sarah Laeng-Gilliatt welcomes comments on this article and can be reached at sarahlg@comcast.net. She is dedicated to further work on strengthening New Mexico's local food system, and encourages anyone who would like to be involved to contact her.

Much gratitude is due to many people who were very generous with their time, providing many insights into our local food system for this project. Most gratifying of all in this work of strengthening local food is that it strengthens community, and this we have in droves in Northern New Mexico! We wish to thank Tawnya LaVeta, and the Southwest Grassfed Livestock Alliance and Farm to Table, Estevan Arrellano of the New Mexico Acequia Association, Mark Winne, Emigdio Ballon of the Tesuque Pueblo Agricultural Program, Le Adams and Pam Roy of Farm to Table, Peter Warshall of Dreaming New Mexico, Joanie Quinn of the Organic Commodity Commission, Robin Seydel and Steve Warshawer of La Montanita Coop, Pati Martinson, Terry Badhand, and Gilbert Suazo of Taos County Economic Development Department, Larry Compton at the Bureau of Business and Economic Research, Robbie Michelle at the New Mexico State Library, Harold Trujillo, rancher and board member of the New Mexico Acequia Association, ranchers Cheryl Goodloe, Dan Flitner, Lana Fastnacht, Walt Marshall, Rick Kingsbury, Dennis Maroney, and Will and Louise Pape, and the people at El Paisano, Kaune's and Whole Foods. Much gratitude is also due to Helena Norberg-Hodge and the International Society for Ecology and Culture for their pioneering work on these issues over so many years.

Notes

1. Unless otherwise noted, all data comes from research bt Ken Meter. Much appreciation is due to the Acequia Association for funding that work. His data is from the 2002 U.S. Agriculture Census, the Bureau of Economic Analysis, the Bureau of Labor Statistics Consumer Expenditure Survey, the Economic Research Service food consumption data and the Economic Research Service farm income data.

2. The freezer beef project has been put on hold since the time of writing. Nevertheless, the skillful conceptualizing done by people at La Montanita remains highly instructive, and it certainly is a great initiative for someone to take on.

3. The Foodshed Project will be given a new name in the near future.

4. Economic Research Service. "Choice beef values and spreads and the all-fresh retail value." 15 May 2007. http://www.ers.usda.gov/Data/meatpricespreads/Data/beef.xls, accessed on 9 Dec. 2007.

5. Calculations done by the author.

6. Calculations done by the author.

7. For information on the inspiring domestic fair trade movement, see "For Health, Justice and Sustainability: Principles for Domestic Fair Trade." tradeobservatory.org. 13 Dec. 2005. www.tradeobservatory.org/library.cfm?refid=101048, accessed on 2 Jan. 2008.

8. Quoted in: Farm to Table and the New Mexico food and Agriculture Policy Council, *Closing New Mexico's Rural Food Gap*. Their citation: Nord, Mark, Margaret Andrews, and Steven Carlson. "Household Food Security in the United States." Economic Research Report No. ERR11. October 2005.

9. Dintenfass, Matthew. "Food First/Institute for Food and Development Policy | For Land, Liberty, Jobs and Justice." http://www.foodfirst.org/node/1810, accessed on 3 Jan. 2007.

10. Pape, Will . "How far did your beef travel?." organicconsumers.org. www.organicconsumers.org/fair_trade/beef.htm

11. See "Place-of-Origin Labeling." newrules.org. www.newrules.org/agri/place.html, accessed on 8 May 2007.

12. Heller, Martin C., and Gregory A. Keoleian. *Life Cycle-Based Sustainability Indicators for Assessment of the US Food System*. Ann Arbor: The Center for Sustainable Systems, 2002.

13. C., Lucas, Jones A., and Hines C.. *Fueling a Food Crisis: The Impact of Peak Oil on Food Security*. London: Greens/European Alliance/European Parliament, 2007.

14. Ibid., pg. 3.

15. Goldsmith, Edward. "How to Feed People Under a Regime of Climate Change." *World Affairs Journal* 7.3 (2003): 3.

16. Pirog, R., T. Van Pelt, K. Enshayan, and E. Cook. *Food, Fuel, and Freeways: An Iowa Perspective on How Far Food Travels, Fuel Usage, and Greenhouse Gas Emissions*. Ames, Iowa: Leopold Center for Sustainable Agriculture, 2001.

17. From a conversation with Joanie Quinn of the New Mexico Organic Commodity Commission, October 9, 2007.

18. For example, see Goldsmith, Edward. (see note 17 above); or Halweil, Brian. "The Irony of Climate." *Worldwatch Magazine,* March/April 2005; or Pimental, David. 1993, "Climate Changes and Food Supply." *Forum for Applied Research and Public Policy* 8 .4 (1993): 54-60; or Rosenzweig, Cynthia and Hillel, Daniel. 1995, "Potential Impacts of Climate Change on Agriculture and Food Supply." *Consequences: The Nature and Implications of Environmental Change*, 1.2, (Summer, 1995).

19. Goldsmith, Edward. pg 3.

20. Kline, William. *Global Warming and Agriculture: Impact Estimates by Country*. Washington, D.C.: Center for Global Development, www.cgdev.org/content/publications/detail/14090, accessed on 26 September 2007.

21. From a conversation with Gary Nabhan.

22.Via Campesina, et al. "Peoples Food Sovereignty Food and Agriculture Statement." http://www.peoplesfoodsovereignty.org/statements/new%20statement/statement_01.htm, accessed on 7 May 2007.

23. "Declaration of Nyeleni: Declaration of the Forum for Food Sovereignty." Nyeleni2007.org. 27 Feb. 2007, Selingue, Mali, www.nyeleni2007.org/spip.php?article290, accessed on 10 September 2007.

Coda

We end with two poems, one old and one new. We thank both Gary Synder and Art Goodtimes for sharing them with us.

For the Children

The rising hills, the slopes,
of statistics
lie before us.
The steep climb
of everything, going up,
up, as we all
go down.

In the next century
or the one beyond that,
they say,
are valleys, pastures,
we can meet there in peace
if we make it.

To climb these coming crests
one word to you, to
you and your children:

stay together
learn the flowers
go light

---Gary Synder
(from his collection *Turtle Island*)

"We thank Wes Jackson and Scott Bontz of the Land Institute for alerting us to this poem."

Children in nature, going muddily. (photo by C. White)

SUSTAINABLE?

To sustain.
From the Latin sub ("under")
plus tenere ("to hold")

as in "to hold up from below."
To keep things going. But
does that mean keeping the world

like it is? Or preparing us
for a changed future? Ecologists
economists & systems theorists

have joined forces to envision
what we might expect from
the biological record of this 400-year

experiment called America.
Named for a minor Italian
real estate scout who put his

John Hancock on a map
to advertise a "New World."
A name he in turn took from

a wild Nicaraguan tribe he'd visited
that gathered and celebrated gold
not as wealth but for its beauty.

And the keystone koan for this cross-
discipline arch of thought is the figure
eight loop of panarchy's adaptive cycle.

Sustainable in the context of resilience
involves designing systems & responses
to future changes that select for success.

It's not enough to simply keep things
going like they are. We will have to
learn to live in a vastly changed world

whether from human caused upheavals
like war, economic collapse, regime
change or natural & unnatural climactic shifts.

And the way forward is to step back
along the lumpy loops of multiple hierarchies
& see how to slide sideways & break free.

How to maintain a fractal line from one
stable state to another reorganized ride
on the rushing wave of the flow.
---Art Goodtimes

~Comanche Creek~

Rio Grande Cutthroat Trout Habitat Restoration Volunteer Project

Friday-Saturday July 18-19, 2008

Valle Vidal, Carson National Forest ear Amalia, New Mexico.

Free!

Bill Zeedyk, Steve Carson, and Craig Sponholtz will lead groups of volunteers to build and maintain bank stabilization structures (post vanes) on the middle reach of Comanche Creek. This will be a great opportunity to learn hands-on how to design and install these treatments! Visit the Comanche Creek website (www.comanchecreek.org) for a virtual overview of the project in it's 7th year. Come for one or both days. This workshop is supported by grants from the New Mexico Community Foundation and The Quivira Coalition's 2007 Land & Water Fund Campaign. We appreciate all our volunteers! Your hard work is helping to make this project a success!

Also, Bill will be leading a tour of the project on Sunday, July 20th. You can register on our website at www.quiviracoalition.org, or for more information phone 505-820-2544 Ext. 5#, or e-mail avery@quiviracoalition.org. We hope to see you on the land!

Enthusiastic Volunteers building vanes along Comanche Creek, July 2007.

The Quivira Coalition
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Santa Fe, NM 87505