

Walking the Talk of Ecosystem Services—

JX Ranch

by Courtney White

Talk of ecosystem services is all the rage today among academics, activists, agencies, and policy-makers. But for ranchers Tom and Mimi Sidwell, who produce grassfed beef in the high, dry plains of eastern New Mexico, this talk is old news. That's because they have been delivering ecosystem services for decades—they just didn't know it had an official name until recently. They thought they were growing grass, building soil, improving the water cycle, and feeding people while earning a living at something they love to do. Calling the management of natural processes to provide essential resources for human well-being 'ecosystem services' might sound new to them—except in practice it's exactly what they been *doing* all their adult lives.

That's why examining this important concept from the bottom up, as in the case of the Sidwells' JX Ranch, instead of top down can help us get past the talk and on to the increasingly urgent job of improving human well-being in the 21st century.

Ecosystem Services Explained

The term 'ecosystem services' came into vogue in 2005 with the publication of the *Millennium Ecosystem Assessment* by the United Nations, which focused on the role ecosystems play, directly or indirectly, in human well-being. The Assessment's basic premise is this: humans, although buffered against environmental stress by culture and technology, are utterly dependent on the flow of ecosystem services for our well-being, such as soil for food production, fresh water for drinking, wood for fuel, grass for animals, and open space for recreation. To make their point, the authors grouped ecosystem benefits into four broad categories:

Provisioning Services: including food, fishing, wild crops, timber, fiber, fresh water supplies, fossil groundwater, and genetic resources (biodiversity);

Regulating Services: including mitigation and adaptation to climate change, protection from floods, conservation agriculture, erosion control, reforestation, wetlands restoration, pest regulation, and water quality;

Supporting Services: including soil stability, biotic integrity, watershed function, photosynthesis, and microbial activity;

Cultural Services: including spiritually significant places, traditional knowledge, educational opportunities, aesthetic experiences, cultural heritage, recreation and ecotourism.

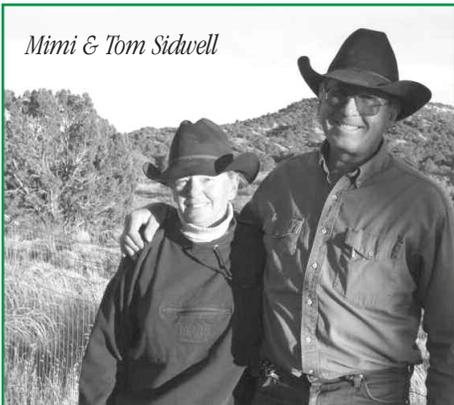
The interaction and integration of these services in a specific ecosystem is key. When they work in harmony with each other, human well-being rises; when they compete or damage one another, well-being declines—and not just for humans. Ecosystem degradation harms the well-being of multiple species as well. The erosion of watershed function, for example, can have cascading detrimental effects on a wide variety of plants and animals.

To no one's surprise, perhaps, the *Assessment* concluded that the current demand for many ecosystem services around the globe is unsustainable. "If current trends in ecosystem services are projected unchanged to the middle of the twenty-first century," wrote the authors, "*there is a high likelihood that widespread constraints on human well-being will result.*" [emphasis added]

Specifically, the authors say that the rapidly growing demand for provisioning services, such as water, food and fiber, has been largely met at the expense of supporting, regulating, and cultural ecosystem services. Increased crop yields in industrialized nations, for example, have come at the expense of soil fertility, widespread erosion, and increased fossil fuel use. These costs have important feedback implications for ecosystem health and the services it provides.

The *Assessment* identifies the following "drivers" as the main culprits in ecosystem service decline:

Mimi & Tom Sidwell



- Changes in local land use and cover
- Species introduction or removal
- External inputs (fertilizer, pest control, irrigation, etc)
- Overexploitation of natural resources
- Climate change
- Natural, physical, and biological agents (evolution, volcanoes, etc)
- Increasing demand for ecosystem services
- Increasing pollution and waste
- Global trade

Of all these drivers, however, it is climate change that is projected over the next century to most affect all aspects of ecosystem service provision. This is particularly true for semiarid drylands, which cover over 40% of the Earth's terrestrial surface and are home to at least two billion people. In fact, desertification has become a major concern already. Predicted hotter and drier conditions as a consequence of climate change will increase pressure on these lands, especially its ability to produce fresh water, likely reducing human well-being significantly.

Also important, though less obvious at first glance, is the role rapid loss of culturally valued ecosystems and landscapes has played in social disruptions and societal marginalization in many parts of the world. This is less apparent because the understanding of the linkages between ecological processes and social processes and their intangible benefits (such as spiritual and religious values), as well as the influence on sustainable natural resource management, is weak.

It all adds up to a strong sense of urgency—which is where the activists, academics, agencies and policy-makers come in. Reducing and reversing ecosystem service decline quickly is necessary if we are to maintain the level of well-being to which humans are accustomed. Accomplishing this work will require collective action, wrote the *Assessment's* authors, because uncoordinated individual action is insufficient to mitigate many issues that have large-scale underlying causes or consequences. They also say that active adaptive management (experimentation and monitoring in order to

create more-sustainable management methods) could greatly improve outcomes for ecosystem services and human well-being.

Enter the Sidwells

In 2004, Tom and Mimi purchased the 7,000-acre (2,800ha) JX Ranch, south of Tucumcari, New Mexico and set about doing what they know best: earning a profit by restoring the land to health and stewarding it sustainably. As with many ranches in the arid Southwest, the JX had been hard used. The land's health had been depleted by substandard cattle, farming, and water management. Grass cover had diminished in quantity and quality, exposing soil to the erosive effects of wind, rain, and sunlight, which also diminished the organic content of the soil significantly. Eroded gullies had formed across the ranch, small at first, but growing larger with each thundershower, cutting down through the soft soil, biting into the land deeper, eating away at its vitality. Water tables fell correspondingly, starving plants and animals alike of precious nutrients, forage, and energy.

Profits fell too for the owners. Many had followed a typical business plan: stretch the land's ecological capacity to the breaking point, then add more cattle when the economic times turned tough, and pray for rain when dry times arrived, as they always did. The result was the same: a downward spiral as the ranch crossed ecological and economic thresholds, ultimately resulting in its breakdown, breakup, or sale. In the case of the JX, overgrazing caused mesquite shrubs to out-compete perennial grass plants, which increased the amount of bare soil across the ranch, which encouraged wind and water erosion, which dropped water tables as gullies grew and deepened and topsoil blew away. Water, nutrient, mineral,

and energy cycles unraveled across the JX.

Changing the Landscape

This did not deter the Sidwells. In fact, after nearly thirty years of experience healing land, they saw the deteriorated condition of the JX not as a liability, but as an opportunity. That's because their business model was holistic and integrated—they look at every part of their property as interconnected. Their goal was to increase the capacity of the ranch at all levels. Profit to them is a means to this end, not the end itself. And after decades of practicing a style of cattle ranching that healed land instead of depleting it, the Sidwells knew exactly what to do on their new place.

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

Tom kept going. He began to feed the cattle on patches of bare soil and on gully headcuts (dry waterfalls that migrate upslope with rain events) and then watched as grass grew—a result of the animals' hooves breaking up the capped topsoil, allowing seed-to-soil contact. Soon he was able to

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Even with the 2011 drought, Tom Sidwell was able to increase his stocking rate by utilizing 2010 stockpiled grass and smaller paddocks with tighter control of graze/trample ratio and recovery.

lengthen the period of rest between pulses of cattle grazing in each pasture from 60 days to 90 days to the current 105 days across the whole ranch, as grass continued to grow under his careful stewardship. This allowed the Sidwells to increase the overall livestock capacity of the ranch by 25% in only six years, which has had a significant positive impact on their bank account. The typical stocking rate in this part of New Mexico is one cow to 50 acres (20ha). The Sidwells have brought it down to one to 36 acres (14ha), and hope to get it down to 1 to 30 acres (12ha) someday. The reason for his optimism is simple: the native grasses are coming back, even in dry years.

In fact, Tom says he has essentially “drought-proofed” the ranch by his management. It was a statement-of-fact, not a boast (he’s not the boasting type). What does he mean? First, by managing the JX for increased land health—soil, grass and water—instead of increased pounds of beef, the ranch has plenty of feed to get through the dry times. Second, Tom *plans* for drought. Every fall, once the growing season is over, he checks his monitoring plots and evaluates how much grass he has left. Then he calculates the stocking rate for his cattle assuming that it won’t rain again until July. If it does rain or snow before then, he’ll adjust the rate upward; if it doesn’t, at least he knows he can stay in business, and within the land’s carrying capacity, until the monsoon rains begin. It’s not the amount of rain that matters, it’s how it’s used when it does come. Ten inches of rain falling on barren, eroded soils will be less effective than five inches falling on grass-covered range. The first runs off, the second sinks in.

If it rains, that is.

In 2011, Tom’s drought planning was put to a severe test. The JX has seen a little more than three inches of rain in twelve months (the average is ten inches). Rather than sell his cattle, however, as

many ranchers in nearby Texas have done, Tom built fences—the JX now has 25 pastures, each with an average grazing period of 4 days followed by 105 days of rest. Tom reports that the ranch has “plenty of grass for the cattle even with a 28% increase in carrying capacity. We haven’t reduced our cow numbers and are weaning the calves tomorrow.”

However, the long range forecast isn’t optimistic—for rain or cows. If another La Niña weather pattern settles in over the Southwest, as predicted, drying things out even further, then the Sidwells will likely have to sell most of their animals. They won’t have a choice—they won’t go backwards on their land management program or their planning.

“Our decision is weighted about evenly between economic and environmental concerns,” Tom wrote me. “The soil has a lot of litter on it and hopefully we won’t get too much erosion or movement next spring when the wind blows. Surprisingly, we have quite a lot of standing 2010 forage. We will forgo herd impact and hoof action, but that’s ok; I suspect that a herd of buffalo would avoid a droughted out area also. We will be in good shape until 2013 when cash flow will need to occur. When it rains again, we plan to winter graze yearlings until conditions are right to get back into cow/calf again.”

Enterprise Diversity

In 2009, the Sidwells converted their beef business from a conventional, feedlot-based system to an entirely grass-fed operation. Grass-fed means the animals have spent their entire lives on grass—which is what nature intended for them—and *no time* in huge, stinky feedlots, eating corn and other assorted industrial byproducts. Grass-fed beef consumes far less fossil fuels in its production and distribution, especially if the customers are only a short drive away from the farm, ranch, and processing facility. It has another benefit: profitability. As an added-value food, grass-fed meat sells for as much as 50%

more than conventional meat—if customers are willing to pay the higher premiums, which in the Sidwells’ case they are.

The Sidwells also run a small tourism business on the JX—customers pay to stay in a pretty guest house on the property and help around the ranch.

Whether the Sidwells can keep both programs going through 2013 and beyond will depend on the drought. All the elements are in place for continued success—but even ‘drought-proof’ ranches need to have rain at some point!

It’s all an example of how the Sidwells are walking the talk of ecosystem services on their ranch. They are supplying *provisioning* services (food and water) while simultaneously restoring and maintaining *supporting* services (soil health and watershed function) and providing *regulating* services (erosion control, improved water quality, resistance to drought, and mitigating climate change). The ranch also supplies a high quality-of-life for them, and an aesthetically-pleasing experience for the guests who pay to stay on the ranch, which means they are creating *cultural* services as well.

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

Now all it needs is a little more rain.

The Sidwells illustrate how we can bring the idea of ecosystem services back down to the ground. Talk of these services tends to be abstract, academic or colored by grim descriptions of crisis and collapse. By looking at a ranch like the JX, however, which has been successfully delivering ecosystem services for years, we can begin to see how the idea managing natural processes for human well-being can actually operate. Not that the Sidwells have all the answers, they don’t, nor will their example be relevant in other social or ecological contexts. But there is a lesson here about the interconnection between soil, plants, animals and people that can be studied for its larger utility.

What the Sidwells have accomplished is neither abstract nor academic. What they do works—and it’ll work for others. Of course, scaling this lesson from the individual ranch up to the collective level, as many say must happen, will be a challenge. But learning how to walk to the talk successfully is the first step. ♣

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Tom’s biological monitoring has shown that even in drought he continues to increase ground cover with litter and perennial grasses. That monitoring helps him find the right balance between economic and environmental needs.

