Living Sheepishly

Most Photos Courtesy
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Photo Courtesy Lyle McNeal

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If you don't know much about sheep, you have probably read or heard about how stupid they supposedly are. Look carefully at this photo. Is what you see a "stupid" animal?

There is a lot going on when a herd is watching that can be hard to detect, both with regard to the object of their attention and among each other. In fact, they are trainable, if one knows how to interest their attention.

Once a herd of sheep have been led over a complex migratory path but once, they can navigate that same path a year later and remember where the water and the good forage were with minimal direction. Can **you** do that? In fact, if a shepherd moves the water from where it was in prior years, a sheep or goat herd will start to express considerable doubt in his or her judgment (which is perhaps a bit more like people than we'd like to admit).

But this little picture book story isn't so much about grazing animals as it is about people and their animals.
In this photo, it's a teacher herding students to herd sheep. I'll bet you can tell which is which. So can the sheep.
They figure it out who is a leader and who isn't the same way you do, by body language, inflection, and smell.

So, think of this as a story of relationships on a very subtle level. We'll start by asking the "evolutionary" question: "Why do sheep exist?" After all, they are not exactly the most effective biological competitors going. One has to wonder how their progenitors survived at all.

They can’t run very fast. They have small lungs, so they can’t run far either. They can’t kick effectively. They have no camouflage. They do not possess effective armor. They get distracted and lost from time to time, so they are easy prey. They can’t bite a predator very effectively (a 40 pound coyote can kill a wild big-horn ram three times its size). Nor do sheep breed and develop fast enough to overcome predation. They’re even good to eat!

So, how did sheep survive in this grand scheme of “natural selection”? Well, it’s really rather simple: They happen to have a relationship with a powerful and occasionally intelligent apex predator that’s enough of a sucker for them to watch over them all the time. Uh, that does sound uncomfortably familiar… maybe they aren’t so dumb?

But “apex predator”? Humans can’t run very fast. Our senses of smell and hearing are dull, and our night vision is lousy. We have no claws, no armor, weak jaws, and small teeth. We breed one-at-a-time, and develop very slowly... What makes us lethal is the skill to make tools, without which we are nothing. Some of us even know it.

So, is it something we share, or is there something irresistibly charming about sheep? Well, they almost always have poop on their backsides, which they don't seem to mind. Well, that's not terribly enticing.

They smell bad and they carry ticks and fleas, so they get a haircut once a year…
whether it is economic to sell the wool or not (hint: if the mills are dying, so is the wool market).
Even if there are World Championships, sheep shearing is not what anyone would rationally call a career move.

This somewhat perturbed Navajo Churro Ram, was one of the very few left at the time this photo was taken. This variety has been saved through the efforts of Dr. Lyle McNeal's efforts to help the people who depend upon these animals as part of their livelihood and culture. These sheep had been nearly destroyed by the US government. Maybe the Navajo know something we don't.

Photo Courtesy Lyle McNeal

Sheep can be stubborn, noisy, uncooperative, and unappreciative, *especially* when you need to do a blood draw.

And still, they just so happened to find this symbiote that is not only capable, but has this need to be a protector.
They know exactly who is in charge and whether that person is apt to take care of them...
Sheep are stupid? What about the people who fall for them?

It isn't hard to do. They teach us something rather important.
Do you see gratitude in that ewe's face? Do you see the reverence in his? How do they do that?

There is just something charming about sheep. No one would confuse this ewe for anything but a happy mom.
They need us, they know they need us, and they know we need to be needed.
Did I say they also taste good, not to mention making a fiber that still has no synthetic equal?

Photo Courtesy Lyle McNeal

There are compensations to the business, although they can also entail hardships.
There's a room with a view…

Note that the sage in this meadow has given way to grasses, just as in Deseret.

Photo Courtesy Lyle McNeal

Sometimes, it's a heck of a view… with luxury accommodations!
Actually, a sheep wagon can be quite comfortable, if a bit sparse compared to your average RV.

But then it beats this pyramid tent, which is more typical for shepherds and cowboys.

There are other compensations, such as hot food on special occasions!

Not to mention fellowship among diverse people with a common passion.

It’s hard not to get romantic about it, because a migratory life is a refuge for romantics.
Hard work, but with time to think. So, great career, right?

Wrong. Like American resource industries across the board, sheep herding is dying.
The old folks are retiring or quitting and the young people are afraid of it.
We will get to why, but first I want to explain why we need a vibrant grazing industry desperately, now more than ever.

Remember the huge problem with Russian thistle in Canyonlands National Park?

…or cheat grass in Zion National Park?

Do you remember miles of cheat grass and musk thistle in Mesa Verde National Park?

Have you seen how powerfully leafy spurge can preclude germination of virtually anything else?

There’s a lot of it too.

Once star thistle escapes a roadside, it can become a rather serious problem.
It dries the soil into a brick.

Have you ever witnessed the total destruction of a forest by kudzu?
Did you know it was planted for roadside erosion control by the US Soil Conservation Service?

Spotted knapweed is certainly dominant, but did you know that it can accelerate erosion by over 100%?

One need only a cursory examination of the thousands of abandoned farms, ranches, and woodlots in this country to observe that land requires management if it is ever going to support healthy native vegetation and wildlife. This former grazing land along Highway 1 (north of Santa Cruz, CA) is now appropriately landscaped with poison hemlock. This former ranch is over-run with thousands of acres of it, courtesy of various “charitable” Land Trusts and environmental groups. No, it wasn’t that way when they took it over; in fact they had agreed to keep grazing it.

The pollen from Poison Hemlock is so toxic that it causes birth defects.

There are 22 million acres of star thistle, 5 million of diffuse knapweed, 100 million acres of cheat grass and another 100 million of Russian thistle, 3 million acres of leafy spurge, there is so much slender oat and rat tail fescue in California most people don't even think of them as weeds any more.

They just call them "the Golden Hills."

There are 7 million acres of kudzu, 2 million acres of Canada thistle, 7 million acres of spotted knapweed, 3 million of diffuse knapweed, 1.5 million acres of Russian knapweed, more than a million of pigweed… Purple loosestrife now covers 17 million acres but that number is dicey, because it is adding another million a year. There is no official estimate on poison hemlock.

You have a choice: VERY expensive herbicides, or grazing animals under knowledgeable control.

A C-130 sprays cheat grass with Plateau® herbicide at Mountain Home Air Force Base, Idaho
Photo by Ms. Angelia Binder, 366th Civil Engineer Squadron Environmental Flight

Weeds destroy water quality, ruin fisheries, raise food prices, accelerate erosion, choke productive timberland... and make LOTS of lovely money for herbicide producers.

But besides economic costs…

"On a global basis...the two great destroyers of biodiversity are, first, habitat destruction and, second, invasion by exotic species" - E.O. Wilson

Since the year 1600, over one-third of all extinctions of native species in the Continental US have been **entirely** due to the introduction of exotic species. You can bet they played a significant role in many more. Personally, over the long run, I think Wilson had it backwards. A Cornell University study estimates that 40-50% of crop, pasture, and multiple-use public lands are now infested with weeds, an amount growing by **1.75 million acres every year**. We are not developing land at nearly that rate.

But the need for a vibrant herding industry is about far more than just weeds.
Herding animals are critical for vegetation management in general.
Do you remember hillsides of Gambel Oak at Mesa Verde National Park,
packed so tight even an elk or deer can't force its way in?

Well, goats can cut back heavy brush, reduce fire hazards, and desiccating trees, while leaving grass, thus restoring wildlife access, releasing more late season water, and allowing for more diverse vegetation. Mule deer and Elk might browse these plants (reluctantly) on a seasonal basis, but it is harder to keep them on the job site.

There are thousands of square miles of BLM land with little but decadent sage and not a blade of grass to be seen. There are at least two problems here, suppressing and revitalizing sage, and restoring biodiversity.

This photo was taken in central Nevada on May 19, 2008, at the height of spring. This is as good as it gets.

Sheep thrive on sage brush, while cattle browse on it reluctantly. Cattle do tend to crunch up decadent sage with their feet, which is why they both fit in this picture of vegetation management with animals.

Proper grazing increases soil carbon and bioactivity which increases rainwater retention for vegetation.

Houserock Valley again. Same day as the prior slide,
Photo #9100: Cryptogamic crusts seal the soil from water and seed
The sage is decadent.

Photo #9104, ten minutes after the photo at left.
Grasses and forbs are numerous while the sage is young and fresh.

Grazing can increase grass and forb cover, which reduces rain impingement that would otherwise loosen soil into an abrasive slurry. Grasses increase percolation, which reduces runoff and therefore reduces flash flooding.

Proper grazing reduces non-native annual grasses, and therefore increases biodiversity of native plants, which in turn provides both habitat and food for wildlife. It can be pretty too. Would you pay for a visit?
Maintaining a view like this is a service that is worth something, isn't it?

Willow Flycatcher
Photo by Susan Sferra, U.S. Bureau of Reclamation

Sage Grouse
Photo by Gary Kramer, US Fish & Wildlife Service

There are also endangered animals that depend upon the habitat once made by Indians and ranchers after them.
Both willow flycatchers (left) and sage grouse (right) benefit from careful use of livestock.

190 MILLION ACRES

of Federal lands are at risk of catastrophic fire. Once they do burn they need rehabilitation.

Look at the burned Ponderosa Pine at right. Do they look like they were once a healthy stand or were they crowded twisted poles?

National Forests have become a disaster area of poor management. When that is pointed out, their defenders just ask for more money so that they can go on using the same top-heavy methods subject to legal and political manipulation that got us where we are.

The National Forests used to make money.

Don't they get it?

Sure they do. The workers just do what they're told…

…while, they crush their private competitors.

Rodeo-Chediski Fire, Aug. 2002, from US 60 near Show Low, AZ Apache-Sitgreaves National Forest

To those readers who are thinking that I'm bashing government as "the cause" of all these problems:

The belief that government regulation came into being because of the damage done by unregulated private industry is missing the point both functionally and historically. First, most of that damage was done on Federal lands, which means that the rape of those lands reflected the preferences of the politically dominant, then just as they do today. It also means that there was no accountability for that damage then, just as there isn't any accountability among federal environmental and wildlife protection agencies today. Second, it is a matter of record that the first architect of regulatory government ("progressive" Republican Teddy Roosevelt) was in fact acting in favor of one group of his wealthy benefactors (J.P. Morgan) at the expense of those of his political enemies (notably the Rockefellers). In sum, the beneficiaries of regulation were crooks, then just as they are today.

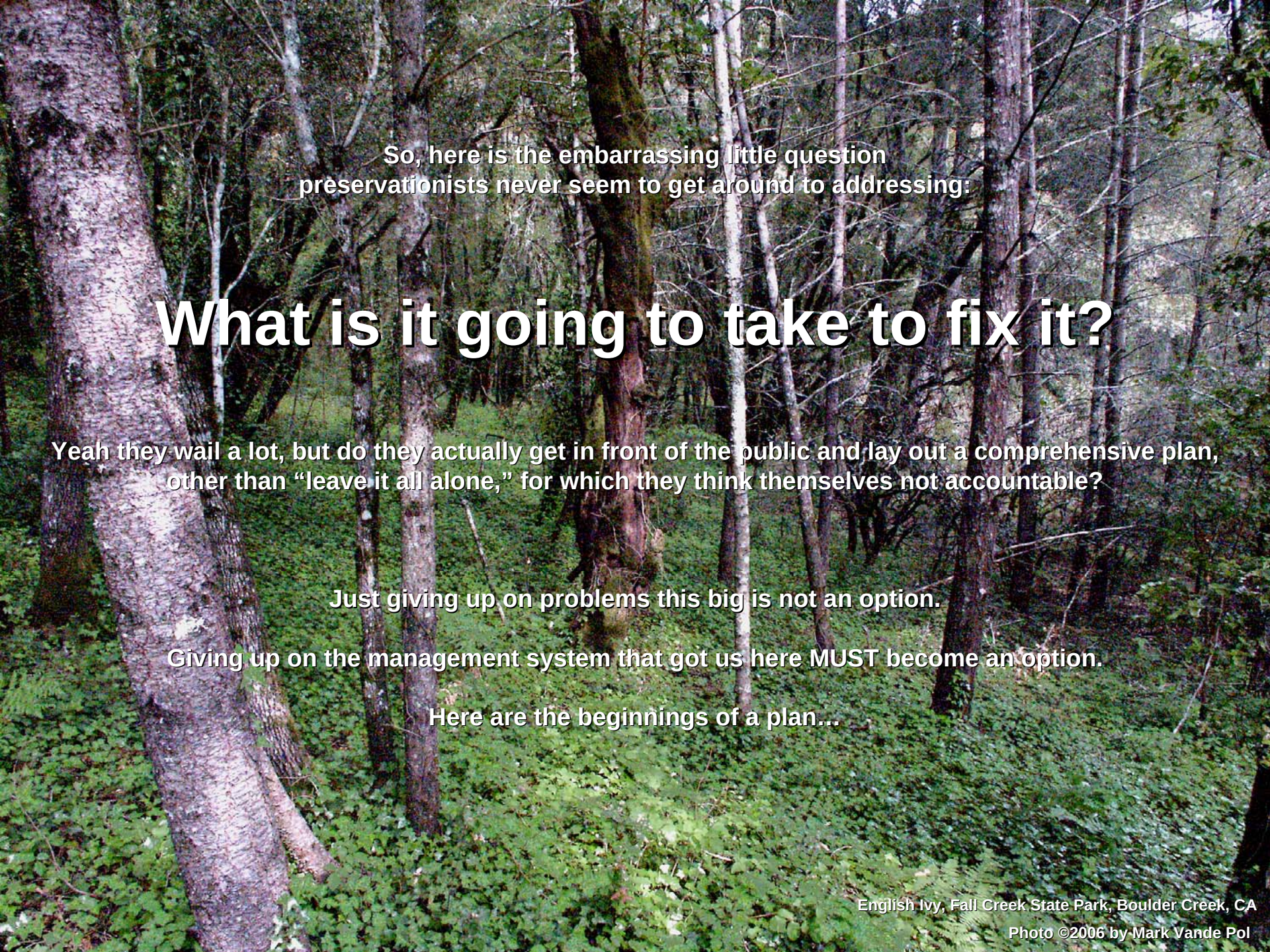
Beyond mere violation of the separation of powers, there is an inherent problem with socialized risk management, simply because of its motivational architecture and enormous scale. No matter how beneficent are the intentions of the legislators, no matter how pure are the motives of the people writing the rules, no matter how immune from graft and corruption the enforcers may be, there is a structural problem when managing a complex and dynamic system with a top-down central planning architecture**:** The system under management is too non-uniform for a system designed around "equality" to be truly just. The necessary details involve analysis of too much information over distances too large to make intimate knowledge of the facts even possible. Further, the huge scale of government operations insures that single-mode failures will proceed over huge areas for decades (ala fire suppression).

None of those structural problems omit the historic inevitability of graft, corruption, inflexibility, and incompetence inherent to any concentration of power lacking accountability upon the part of its agents. This is not to say that there should be no government, but that free-enterprise control systems account risks, invest in offsetting assets or process management technologies that mitigate the risk, and then verify the accuracy of data describing those transactions, both independently and with financial accountability for the integrity of verification. Such systems rely upon numerous competitors in the validation, verification, and risk pooling businesses, and demand the detailed product knowledge of local conditions that is anathema to "big business." They involve a huge transaction volume that would require automated measurement and transaction processing. It is a 21st Century concept to deal with the damage done by the existing 19th Century paradigm**:** industry leaders "serving" as regulators because "only they understand it."

Or else we could simply have a society of people who really do love each other as themselves.

Hence, the entire direction we have been heading toward ever more invasive regulation in the name of assuring honest and competent risk management in business dealings, will in fact deliver its antithesis. It will merely become a means for a very isolated few to raid the entire asset foundation from the top. It doesn't matter if the asset is money, timber, mineral wealth, or food production capacity, setting up systems that concentrate control may appear more efficient, but they are inherently liable to colossal failures.

Isn't that what we are seeing?



So, here is the embarrassing little question
preservationists never seem to get around to addressing:

What is it going to take to fix it?

Yeah they wail a lot, but do they actually get in front of the public and lay out a comprehensive plan, other than “leave it all alone,” for which they think themselves not accountable?

Just giving up on problems this big is not an option.

Giving up on the management system that got us here MUST become an option.

Here are the beginnings of a plan…

English Ivy, Fall Creek State Park, Boulder Creek, CA

Sheep have a great track record with spurge, and can even be taught to eat it selectively. To me, this is amazing. As you can see, the results on the left hardly look like the denuded wasteland anti-grazing activists will flog with fear. Sheep can do this job for $10 per acre. Spurge otherwise requires very aggressive herbicides.

Photo courtesy Dr. Karen Launchbaugh
University of Idaho

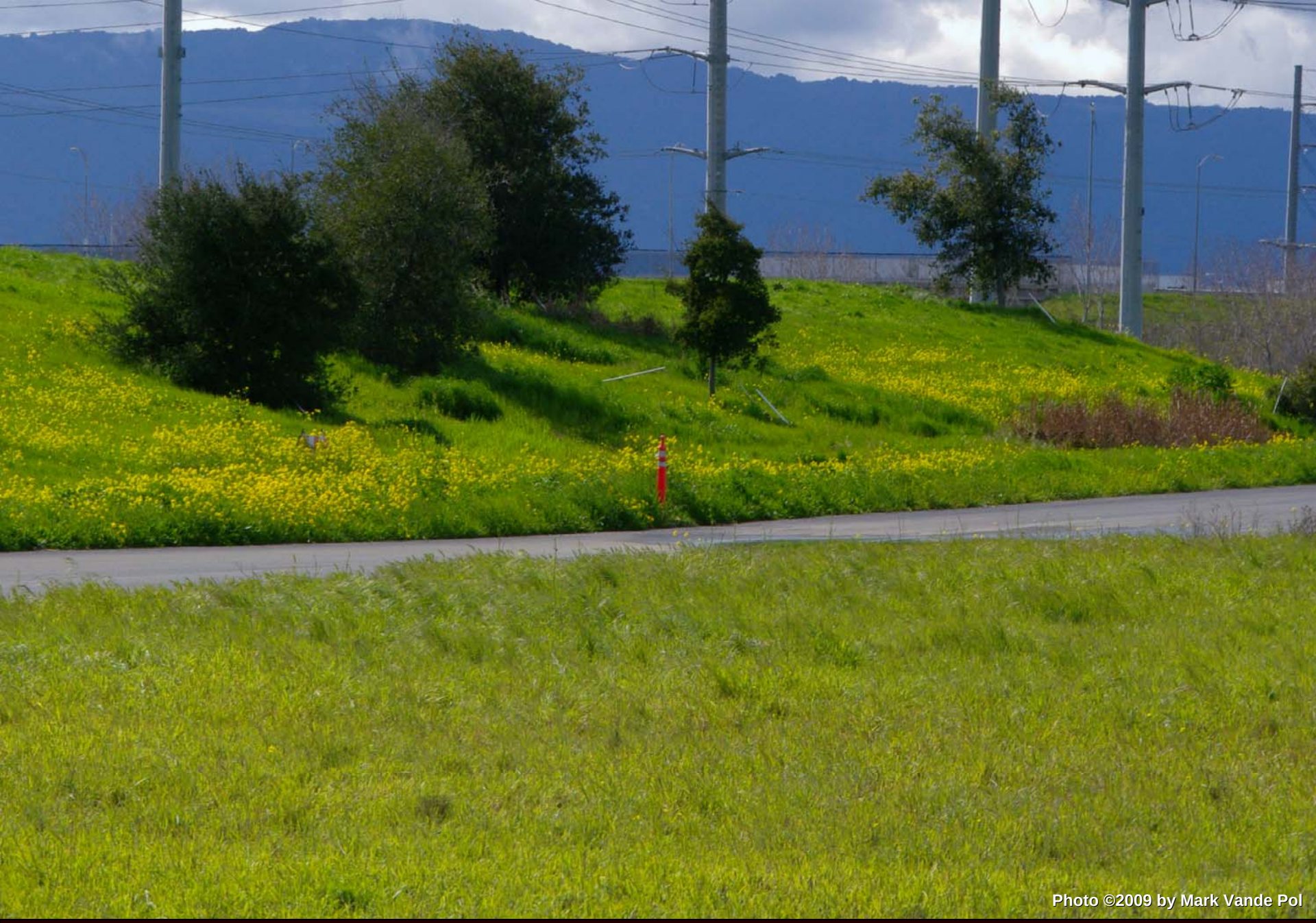
The Forest Service once spent $440 per acre controlling star thistle with herbicides in California, in part, because of the paperwork. Goats can do that job for less than 10% of that while improving conditions for native plants.

Sheep and goats devour Russian thistle, Canada thistle, knapweed, and other asters.
Five years after the construction of this exclosure on Deseret Ranch, the inside is filled with Canada thistle;
while the outside (where it is grazed) is covered with sedges and grasses, free of weeds.

Goats mangle kudzu. It took eight goats four days to take this patch from this…

…to this. Four days. If the university community were willing to tolerate them, a couple of good shepherds could take care of the whole campus, easily, grass included, which indeed is “a big if” as goats can be obnoxious.

Sheep cut annual grasses (such as cheat) to the ground all winter long (this is mostly “rip gut” brome, which is similar and just as destructive). The grass here will grow as high as six feet, thus the sheep are also here to control a fire hazard around nearby power and sewage treatment plants. What you don’t see here is the mustard.



…because the sheep already did a number on that on the near side of the road. The sad part is that there are so few sheep around here and the market is so flakey the grazing contractor had to go as far as Texas to find enough animals to keep up with the growth.

Feast your eyes, this is some of the last abandoned farm land in Silicon Valley, currently on the block for a baseball stadium and parking lot. As land, you can mow it, spray it, or graze it, but the first two pollute and deplete the soil. Grazing gives you food, clothing, soil, flood control, and enhanced habitat for bugs and birds… but then, there's always the parking lot. Take your pick. The plant managers paying for this project told me that so many people come to see the sheep it's almost a nuisance. Do you think maybe that indicates a deficit in our modern lifestyles that isn't simply "open space"?

Grazing animals can convert a denuded salt-flat into a productive field because the intestinal bacteria can dislodge the salts from the soil particles, but only when managed properly.

The process is as follows: spread hay, animals eat it, poop on it, and trample in the organic matter.
The grasses can then germinate in a fertile medium that builds soil organics from decomposing roots and bacteria.

Candeleria Mine Reclaimation, SE of Mina, NV

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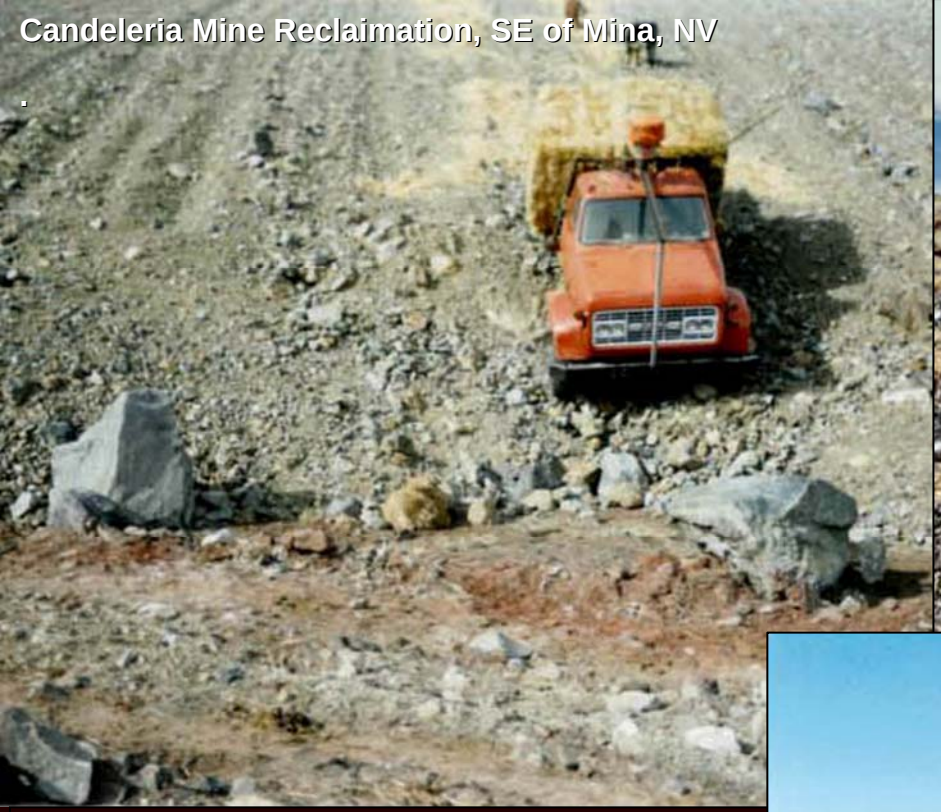


The same process works as a cost-effective means to reclaim mine tailings.

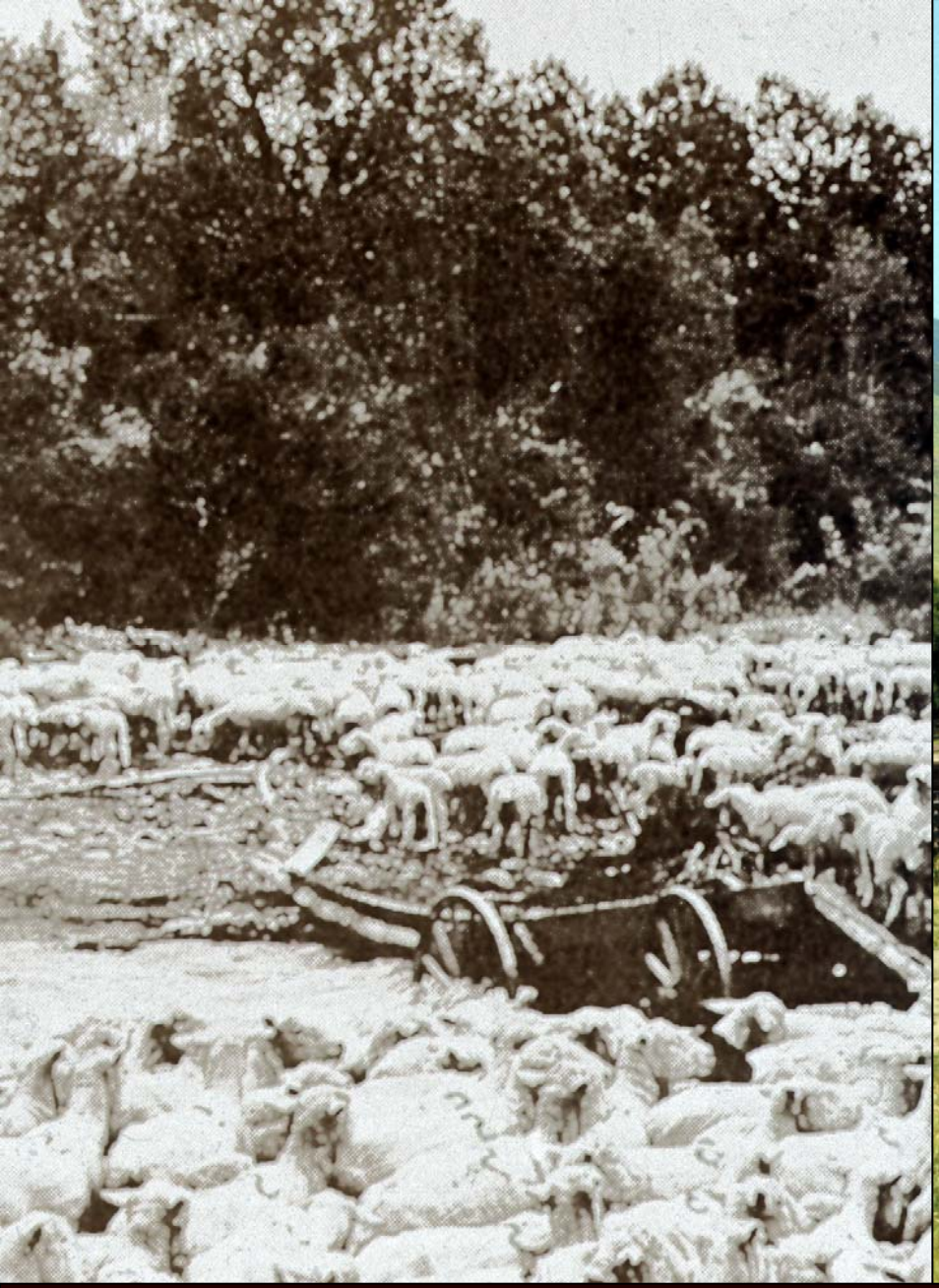
Significantly, intestinal bacteria from grazing sequester sulfates that prevent acids from leaching out heavy metals while simultaneously mobilizing the light mineral salts left behind from the water used to rinse out residual cyanide.

Break the surface, spread native grass straw, bring in the animals, tromp, chew, and poop, wait for winter, and voila! A process like this requires little to no irrigation. This method has become increasingly accepted in the mining industry.

Photos Courtesy Jerrie Tipton
Candelaria Gold Mine Reclamation Project, Mina, NV, 1997-98

Yes, grazing can do all that, and you get useful products out of the deal. One problem with that idea though,

How many animals would it take?



Photos Courtesy Lyle McNeal

There are just over 6,000,000 sheep left in the United States, only one seventh of its peak in 1942.
New Zealand, at two thirds the size of California alone, supports seven times as many sheep as the entire US.
But herd sizes alone are not close to being the limiting factor.

It takes people who want to be shepherds.
To be a good a shepherd doing restoration work is far more demanding than one might think.

It is one thing to be able to distinguish the 336 plant species such as at our place, but for a shepherd who must move the flock with the changes in seasons, it could be thousands. Bugs? Snakes? Fungi? Geology? Soil properties? What kind of person would it take to do all that in forest, grassland, and riparian systems in coastal, montane, AND desert environments?

To keep the grazing animals eating the pests instead of the tastier stuff, requires an individual both highly skilled in animal behavior AND with the emotional temperament to execute that knowledge. Such attributes in people are seldom learned later in life, it takes a common culture of animal husbandry.

It takes people who will accept certain risks.

It takes a modicum of veterinary training to keep the animals healthy.
Processing plant toxins places a load on the liver. To keep animal diets in balance while eating weeds requires blood monitoring to maintain the balance of protein and carbohydrates in their diet.

That information can then inform the shepherd how much feed they will need to deliver to maintain a proper protein/carbohydrate balance. That requires access for the equipment to supply feed and water.
That takes infrastructure too. Environmentalists don't want the roads.

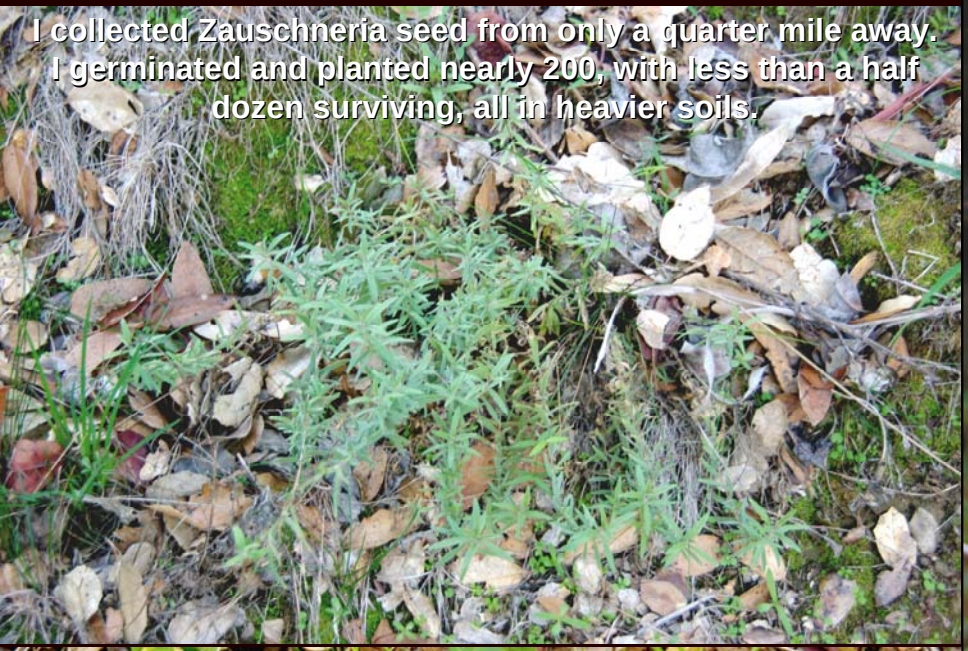
One needs to know how to ride a horse and train a dog to do complex tasks, whether holding the herd together, or searching for lost sheep. Keeping animals safe from predators means possessing the knowledge to to track, hunt, trap, and shoot. Such skills are best learned from childhood too.

Antelope Mingling with Cattle
Photo courtesy Laura Schneberger

It requires an understanding of the behavior and requirements of the wild animals in the various systems a herd encounters, to manage the habitat for both resident and migratory species.

Photos courtesy Parks Canada

That knowledge can be applied to induce herd behavior near inhabited areas without the need for predators.


I collected Zauschneria seed from only a quarter mile away. I germinated and planted nearly 200, with less than a half dozen surviving, all in heavier soils.


These native blackberries are suffering from a nutritional deficiency, possibly molybdenum.


The later hit rate on Golden Bush was 70%, planting them late in a drought year with no water. Over time, we learn.

It takes the knowledge to identify a soil deficiency, to know which local plants would work among complex soil variations. Restoring our own measly 14 acres has taught me that lesson repeatedly, and without mercy.

It will take the equivalent in education of a doctorate degree to be that capable, requiring either amazing people who have developed these skills from childhood, OR it will take information systems and equipment far beyond what we have available today, probably both. Yet this is the amount of knowledge we truly need available to animal managers to care for an integrated wildland landscape.

So, if this is such a cool thing to do, if it is such a tremendous intellectual challenge, if using grazing animals can be so amazingly cost-effective, if we are already flushing much of the money down the drain with wasteful and destructive bureaucracy, legal costs, market manipulation, and corruption, if the work carries the public respect for the personal sacrifices required to restore wildland habitat, what is the problem with reviving this industry?

There aren’t enough people who want to be shepherds, there aren’t enough people who are capable of training them, there aren’t the facilities with which to train them…
and we are rapidly running out of people capable of being their teachers.

We don’t have the vets, the field-hardened electronic blood analyzers, the dogs, the sheep wagons, any of it.
We do not have the infrastructure of a healthy sheep industry. Why not?

Government regulation and market manipulation in the name of environmental “protection” is destroying this industry. Worse, it is destroying the common culture that has provided its people.

Nobody would do this if there wasn't a bond: people with animals, and people with the land. Animals are just a part of that picture, but they are the focus of it. Now, I'll tell you why they are quitting.

The character of shepherds is one of nurturing, to be guides and guardians to their animals. For such a person to be forced to watch animals they have birthed with their own hands die, not out of necessity, but for the sheer joy of killing, **without being allowed to do ANYTHING to protect them,** because armed bureaucrats are protecting the predators in order to make pompous ignorant boobs living thousands of miles away feel better, destroys the bond between humans and sheep.

It not only neglects that symbiotic relationship, it shatters it.

The losses do not have to be appalling to be fatal to the industry; they only have to be enough to make them uncompetitive with foreign suppliers and a sufficient disruption to the shepherds' way of life to cause them to quit. The average loss to predation is nearly equivalent to the entire gross margin on operations.

It is effectively a politically-driven economic slaughter, but sheep and shepherds aren't the only victims.

There is well supported evidence that big horn sheep in the US are in a predator pit. They may go extinct, principally because of coyotes people used to control to protect *their* sheep.

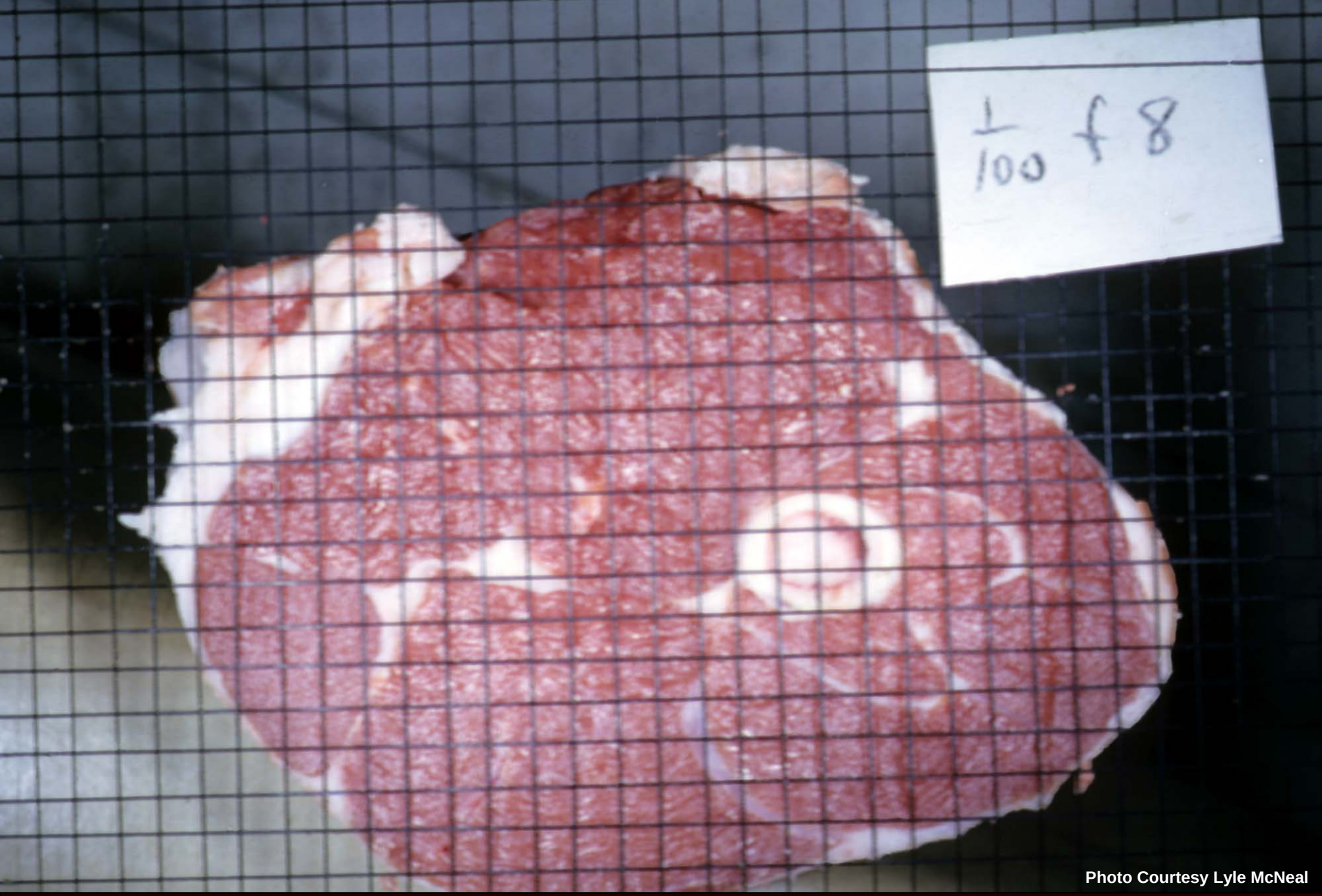


Photo Courtesy Lyle McNeal

The American sheep market is dominated by meat sales, not wool, the principal reasons for which are labor costs for processing wool and improvements in synthetic fibers developed by the same corporations whose major stockholders hold those tax-exempt charitable foundations that give buckets of money to environmentalists.

There is also the matter of economies of scale. As more clothing is imported, raw wool loses domestic market share. If you had a train, would you stop to pick up a load this small compared to what it used to be?

Photo by Tim Findley, Courtesy Range Magazine

Unless cattlemen and shepherds are allowed to make a profit commensurate with the cost reduction against other methods, or are compensated for the ancillary services they can and do provide, they won't have the capital to attract investment in new equipment, training, research, and supply infrastructure. That means unless the weed manager can charge nearly as much as it costs the bureaucrats to do the job some other way, **including internal costs,** the weeds will continue to spread because the shepherds won't have the capital to rebuild the industry. If we do not rebuild our nation's pastoral industry, the weeds will win. Unfortunately, the animal managers are competitors of the same unionized bureaucracy the public has invested with the power to let the contracts.

I'm a father, and an educated techie. I raised my two girls to appreciate the land, so they know our weeds on sight. They shoot straight and calm. They ride well. They can tolerate hardship. But I also made sure they both started college calculus before they were 14. They wrote their first graduate-level paper on Roman history when they were 12 & 13. The two will have almost a dozen college advanced placement tests to their credit. So, what do they want to do for careers? Are they going to be the fearsome Federal Judge and contract software specialist I had dreamed? Uh, no. One is into soil science while the other wants to go into animal behavior. Have I "failed"?

Should I tell them that because caring for nature is an anachronism, because the only jobs doing it are for the government, where they will either comply with what they know could never work or be harassed on the job for speaking their minds, because they know the bureaucratic way is so costly that the Federal government will eventually go bankrupt because the nation's foundation will no longer be able to support it. Should I say, "No"?

Digestion and Utilization of Nutrients in Oak Browse by Goats A. S. Nastis and J. C. Malechek. Utah State University, Logan 84322 J. Anim Sci. 1981. 53:283-290. © 1981

Big Horn Sheep (Male), Near Jasper, Alberta, Source: naturespicsonline.com ([1]) Date: Oct. 2007; Author: Alan D. Wilson

Sage Grouse, Centrocercus urophasianus; Source: U.S. Fish and Wildlife Service Digital Library System; Date: 2004-12-09 (original upload date); Author: Gary Kramer

Coyote, originally posted to Flickr October 2002, by marya (emdot) from San Luis Obispo, USA, reproduced under the Creative Commons License and may be obtained for replication from **here**.

Yosemite Highway 14 star thistle infestation from **http://www.nps.gov/archive/yose/news/2004/ystar5.jpg**

Kudzu image by John D. Byrd, Mississippi State University, Bugwood.org
http://www.invasive.org/browse/detail.cfm?imgnum=1624015

Spotted knapweed Norman E. Rees, USDA Agricultural Research Service,
http://www.invasive.org/browse/detail.cfm?imgnum=0021035

Leafy Spurge **Steve Dewey**, Utah State University, **http://www.invasive.org/browse/detail.cfm?imgnum=1624003**

Kudzu, invasive plant control using goats. The project was funded by USDA-CSREES and NC State University, Departments of Biological and Agricultural Engineering and Animal Science. The project location was NC State University Centennial Campus, North Creek, Raleigh, NC. For list of cooperating agencies:
http://www.bae.ncsu.edu/programs/extension/wqg/northcreek_images/spooner.pdf.

Photo of confrontation between BLM agent, Bob Abby and Sheriff Ken Jones
By Tim Findley, Range Magazine, **Winter 2003 Issue**.

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