Chapter IV

RANGE DEVELOPMENT: ENVIRONMENTAL EFFECTS

Rancher Wayne brings in 200 head from March through July to feed on the lush spring growth on this typical 12,000-acre BLM allotment. The cattle spend their time on the fertile, grassy flats and along watercourses and moist drainages. They eat selectively, consuming the most nutritious bunchgrasses, herbaceous perennials, riparian growth, and choicest browse.

The first year his cattle grow fat, and Wayne is happy. The second year, he is still pleased, but at the end of the grazing season his cattle haven't gained as much weight. At the end of the third season, the year's herd is thinner still, and Wayne is beginning to worry.

The years pass. Soon after each of the intermittent wetter periods, Wayne's hopes rise with the new green growth, but this never lasts long; overall trend is downward. The allotment is progressively more ragged and cowburnt. Wayne's cattle become less selective, eat decreasingly palatable vegetation, and roam farther to find enough to eat. They are undernourished and disease-prone. Reproduction is low, mortality high.

Like most public lands ranchers, Wayne derives a minor portion of his total income from ranching public land. However, he is unwilling to admit the obvious -- that Wayne Allotment, like all public allotments, is an inherently lousy place to raise livestock. Rather, like his peers he blames failure on bad luck, bad weather, predators, high production costs, low beef prices, vandals, government rules and regulations, and so on. Wayne is committed -- socially, politically, habitually, and emotionally as much as financially -- to being a celebrated Cowboy with 12,000 acres and a 200-head herd. He is not about to cut his herd, and he knows the BLM won't force him to, to any significant degree.

Wayne is in a quandary, being adamantly opposed to reducing herd size, but realizing the need to increase the allotment's suitability for livestock to maintain herd size. Like most ranching advocates he inevitably sees only one solution: begin the government-sponsored range development process to artificially improve the range for livestock. Not only will this maintain Wayne's livestock production at government expense, but it will place the burden of responsibility for keeping the allotment productive squarely and permanently on government (taxpayers') shoulders. Once the range development program stabilizes a certain production level, government will be *expected* to maintain that level indefinitely. Though Wayne is happier, the story doesn't have a happy ending.

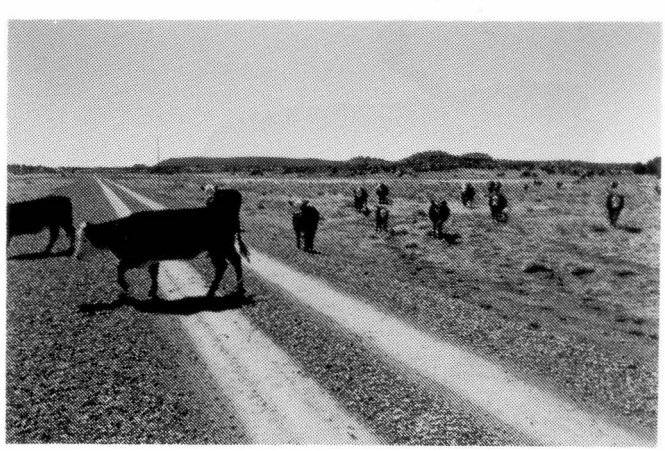
The West is systematically looted.
--Bernard DeVoto

A range improvement program may include wells, reservoirs, detention dams, ditches, water spreaders, storage tanks, pipe lines, spring developments, watering troughs, fences, corrals, loading chutes, dipping vats, cattle guards, weighing scales, riders' cabins, bridges, truck trails, stock trails, stock driveways, water-hauling roads, firebreaks, contour furrowing, check dams, diversion dams, subsoil sagebrush eradication, plowing and range reseeding, noxious and poisonous weed control, rodent control, insect control, predatory animal control, reseeding of logging roads and skid trails, brush burning and reseeding, and eradication of brush stands by chemical spraying.
--Phillip O. Foss, **Politics and Grass** (Foss 1960)

Livestock have wasted the West more than any other single agent, but they are helpless pawns in a complex game of maximum profit and power. Stockmen, government range managers, university and business professionals, politicians, and other components of the ranching establishment are in charge. And while the impact of livestock grazing is more than enough reason to end public lands ranching, *it is only half of the environmental story.*

For more than a century, in its attempt to maximize livestock production, this grazing establishment has in effect waged war against the Western environment.* The industry fights its war with what it calls "range improvements" and "range management," 2 basic weapons systems which together may be termed "range development." Its enemy in this never-ending battle is anything that inhibits or is perceived to inhibit maximum livestock production. As will be evident, this includes an incredible number and variety of living things and inanimate objects.

* Additionally and significantly, many ranchers habitually manipulate the land due to long-standing tradition, because it gives them a feeling of doing something worthwhile, or simply out of sheer boredom.

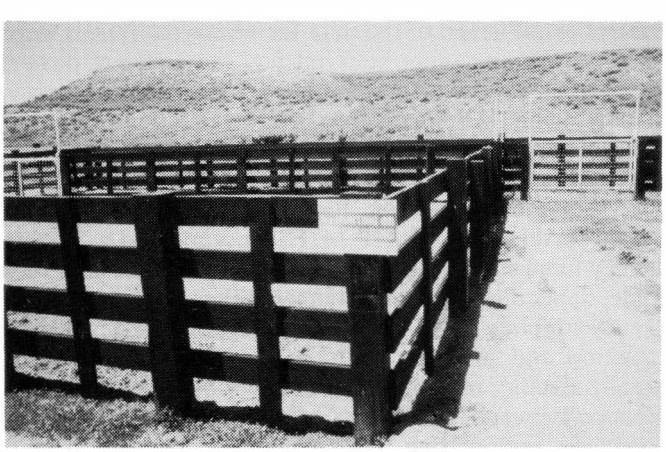


Range "Improvements"

Fixed developments on the open land that facilitate livestock production may be termed "range improvements." As with "newspeak" in George Orwell's classic, **1984**, the wording is intended to rearrange the reality of whoever sees, hears, or uses it. By consistently calling anything they do to the land an "improvement," ranchers and their aides lead people to believe that these developments actually do *improve* the range, and should therefore be supported. Taking reality-bending terminology one step further, BLM recently has begun calling range developments "accomplishments." By constantly defining and redefining range terminology in relation to the land, the ranching establishment creates a widely accepted, malleable, self-serving reality.

Purposefully obscured is that these developments are designed to improve the land *for livestock grazing*. And though they may temporarily benefit livestock production, they usually degrade the environment and public use.

Millions of fences, stock tanks, and other range "improvements" have been constructed on our public land, the vast majority with our taxes (see Chapter VII). They and the land they occupy are treated more or less as private property by stockmen. BLM does in fact consider some permanent structural developments made by ranchers on federal land to be private property, effectively privatizing the land they occupy.



This corral is posted "NO HUNTING OR TRESPASSING" -- essentially privatizing the BLM land it occupies as well.

Fences

Barbed wire is shaped like a certain attitude toward the world; it lends a taut-strung control over a large area. It works because it derives maximum cruelty from a minimum of material. Like many other elements of our culture, it is hated almost as widely as it is used.
--C.L. Rawlings, Western poet

The most conspicuous so-called range "improvement" is the ever-present barbed wire fence. Fences stretch for hundreds of thousands of miles across Western public land, almost all of which serve solely or primarily for livestock grazing management.

As mentioned, each Western public lands grazing allotment encompasses an average of more than 10,000 acres, or about 16 square miles -- representing a territory about 4 miles by 4 miles (though they are rarely square). Each of these 30,000 allotments is enclosed by boundary fences around its perimeter. Even if all allotments shared all boundaries and were perfectly square, this would still amount to 245,000 miles of fence. Allowing for boundaries shared with private lands and non-grazed public lands and the common irregular allotment shapes, the figure is certainly at least 300,000. However, most allotments are also cross-fenced, many heavily so, and other non-boundary fences on allotments run along roads, utility corridors, recreation area boundaries, and so on, altogether probably traversing at least as many miles as allotment boundary fences. Thus, we may reasonably estimate at least **600,000 miles** of livestock fences on Western public land -- more than enough to stretch to the moon and back, or around the Earth 24 times! Including private lands, which generally are more heavily fenced than public, the figure for the West is surely well over 1 million miles.

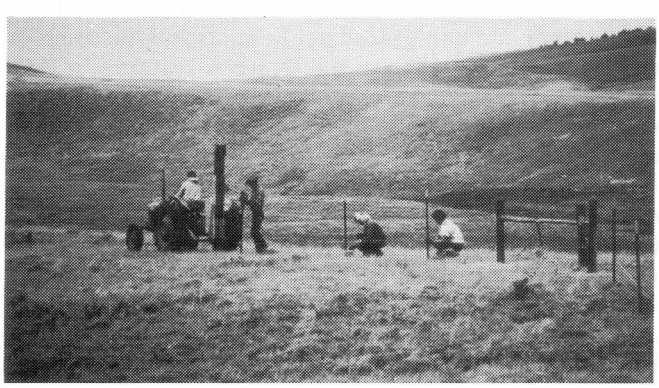
There are 2 basic types of fences. *Division fences* enclose the boundaries of a range grazing unit. They are used to divvy up our public land into manageable grazing allotments for use by private livestock interests. Division fences also divide these allotments into smaller parcels for conducting various grazing systems, segregating livestock into different age and sex groups, and keeping different owners' livestock within their respective grazing areas on joint allotments.

Drift fences are not intended as enclosures, per se, but as barriers to keep livestock in certain areas and prevent them from drifting to areas where they are not wanted. Many drift fences retain livestock in certain preferred grazing areas, often tying in to natural barriers such as steep ridges, ravines, and cliffs. Others keep livestock away from poisonous plants, extreme rockiness or brushiness, dangerous cliffs, or predators. Some drift fences are used to help funnel and then contain cattle during roundup. Still others keep cattle and sheep off roadways and out of campgrounds, recreation areas, or grass seeding areas. Drift fences may even be intended to keep competing wild herbivores away, or to exclude people from certain livestock areas.

Of course fences can also be used to protect the environment from livestock, as is often the case with National Parks, nature preserves, and such. Nonetheless, if there were no livestock on adjacent public land these fences would not be needed. For example, after livestock grazing was terminated in both Organ Pipe Cactus National Monument and Cabeza Prieta National Wildlife Refuge in southwestern Arizona, the long barbed wire fence separating the two no longer served any purpose and was removed.

Many well-meaning groups and individuals have proposed fencing livestock out of selected ecologically sensitive areas -- especially heavily "cattlized" riparian zones. Though their intent is commendable, this is a poor substitute for removing livestock from these areas. For instance, throwing cattle out of riparian zones and onto surrounding rangeland would result (and has resulted, where it has occurred) in more damage to these less heavily grazed and often more fragile areas. Riparian ecosystem consultant Harold Winegar concludes

> *Watersheds are all connected. If you move cattle out of the stream bottoms and into the uplands you will still be pounding to death the springs, seeps, and creeks, not to mention contributing to soil compaction over the entire uplands. More fences also entail more wells drilled, roads and stock tanks built, water sources developed, and other harmful ranching development.*



Forest Service installing a fence on Montana range. *(USFS)*

Fences serve many other purposes, not the least of which is giving public land the appearance of private ownership. Stockmen benefit in several ways:

Probably most Americans, when confronting a barbed wire fence or gate, assume the land behind is privately owned or, if publicly owned, is off-limits. Many others are unable to cross over. This group of people -- sightseers, photographers, picnickers, hikers, campers, fishers, hunters, birders, rockhounds, Nature lovers, and so on -- represents the general public. In keeping this large segment of the population away from most public rangeland, fences help prevent the public from becoming aware of ranching abuses.

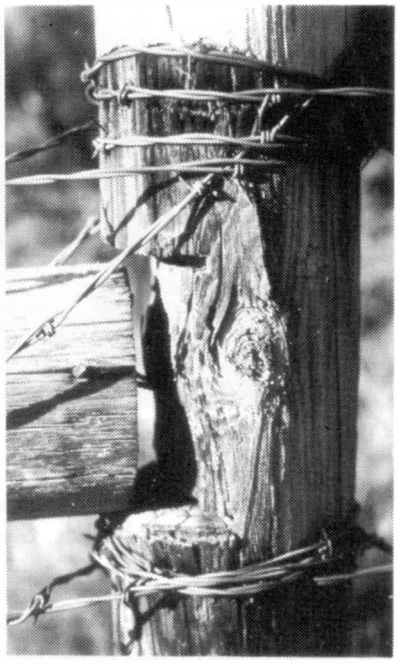
Others who visit public land for purposes of resource exploitation are generally well aware of land ownership, and so are not deterred by fences and gates. Indeed, most of these people are glad to have fences to filter out the general populace -- what they consider a nuisance and potential opposition. Consequently, in effect, what fences do is allow through those people who tend to exploit public land and bar those who would tend to defend it.

Additionally, by keeping the public off public land, ranchers minimize competition and hindrance from "non-consumptive" land users. These people scare cattle and leave gates open. They complain about overgrazing, livestock-polluted water, lack of wildlife, and cow pies, flies, and cows in their camps. Some cut fences, punch holes in stock water tanks, take salt blocks, remove traps and poisons, damage corrals, vandalize ranching equipment, and shoot cattle.

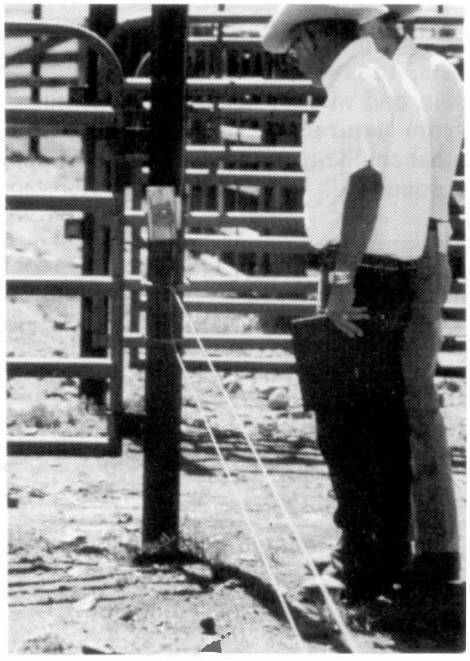
Importantly, fences tend to foster in stockmen a sense of possession of public land. Barbed wire is a worldwide symbol of conquest and domination. Fences define boundaries of influence. Any land, enclosed and cross-fenced with barbed wire, seems under the control or influence of the man for whom the fences were built. Stockmen cannot help but feel this sense of power; indeed, many relish it. The psychological motivation it gives helps provide the impetus they need to treat public land as their own.

If a permittee can demonstrate a need (or an apparent need) for a new fence on "his" allotment, construction is usually forthcoming. The BLM, FS, or other land managing agency almost invariably supplies planning and materials while, depending on circumstances, either the permittee or agency supplies labor. Quite often government plans construction and provides both. Additionally, the taxpayer usually assumes responsibility for fence building and maintenance between allotments, along roadways and utility corridors, surrounding federal installations, and around other government and private lands requiring exclusion of livestock.

Livestock fences on public land are of many different kinds, but by far most common is 3, 4, or 5 strands of barbed wire set on wooden, metal, or (very infrequently) reinforced concrete posts. First, sturdy, well-anchored corner and support posts are installed. Then strands of barbed wire are stretched tightly and nailed or wired to the "line" posts between. Or, barbed wire strands are simply stretched from tree to tree, or sometimes between rock faces. Posts are commonly spaced 20' to 30' apart, with 2 to 4 equally spaced wooden or special spiral metal "stays" holding barbed wire strands the proper distance apart so cattle can't push their way through. Gates may be spaced miles apart or as closely as 4 or 5 per mile, depending on the wants and needs of the local rancher and the priorities of the local public lands managers.



Wire mesh fences are used on many allotments where sheep are grazed. Where tourism is important and scenic quality high priority, log or split rail fences are sometimes employed. In portions of the high country West, especially where moose wander right through ordinary fences and abundant lodgepole pine or other small, straight trees provide free fence materials, "buck-and-pole" fences are the way to go. Even rock walls are seen occasionally in some extremely rocky areas, usually where volcanic activity has provided numerous medium-sized rocks. And electric fences are increasingly popular on public land. Some of the more modern of these are set up in various grid patterns and connected to a central switchboard.



Electric cattle fence. *(Paul Hirt)*

In some grazed areas with significant pedestrian traffic, people cross fences on specially designed stairs or through U- or V-shaped chutes which allow through people but block cattle.

Where fences traverse exposed rock, holes are drilled and posts anchored into concrete. BLM land near Moab in southeast Utah.

Construction and maintenance of livestock fences is not the hokey, harmless activity pictured in cowboy movies and TV commercials. It often entails bulldozing vegetation, chainsawing trees and brush, girdling trees with wire (which often kills them), dislodging large rocks (from the ground, outcroppings, or cliff faces), excavating topsoil, sometimes even dynamiting. Fence building consumes endless rolls of barbedwire, millions of metal posts, tons of nails, staples, and wire stays -- from natural resources that could be left in the ground.

Where fences span drainages and low spots, boulders, logs, or other heavy objects are displaced and wired to strands for stabilization.

Lower branches of this tree were cut for fence posts, killing it.

For posts, stays, gates, corrals, etc., ranchers and government employees have cut branches from, or cut down, millions of trees and bushes. Stockmen often are given permission to cut wood for ranching materials in areas where cutting for all other purposes is disallowed. Not bothering with even the formalities, many ranchers simply cut whatever they want, whenever and wherever they want. Thus, in some areas of the West the sparse brush and tree cover has been depleted, disrupting environmental processes and other human use.

Some girdled trees grow around the wire, but many eventually die because the wire chokes off their vital cambium layer. Millions of trees in the West have been girdled for fences.

This oak bears old scars from barbed wire, which may have introduced the disease that killed it. Coronado National Forest in southeast Arizona.

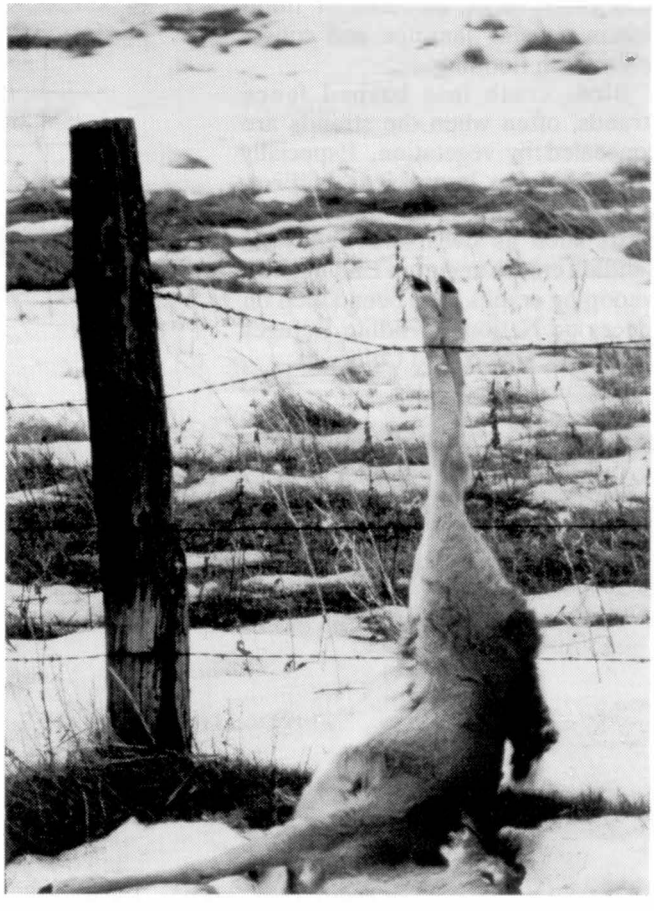
Wide swaths are cut through woody vegetation to facilitate construction and maintenance of fences.

Wherever possible, the government and ranchers build roads to help in the construction and maintenance of fences. In gentle terrain, the rancher may simply drive cross-country in to and alongside fencelines, thereby creating new roads. A common rangeland sight is the miles-long, arrow-straight fenceline leading into the horizon with a paralleling dirt road at its flank, or on *both* sides.

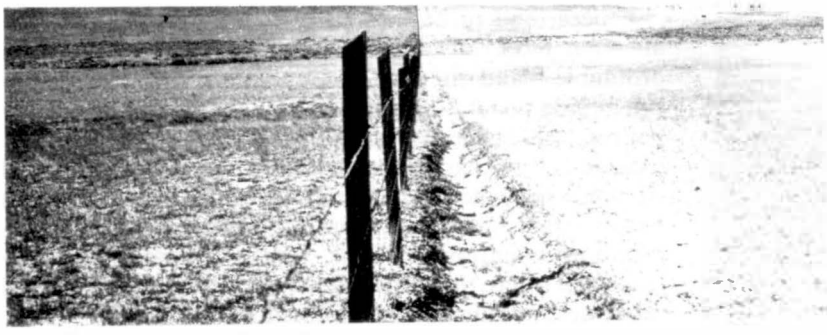
After fences are completed or repaired, waste materials commonly are discarded onto the nearby countryside or left where they lay. Old or obsolete fences usually are left to rot or rust where they stand, leaving spaghetti-like strands of rusty barbed wire strewn across the landscape laying in wait for passing animals, humans, and vehicles.

Fences tend to be located where easiest to build and maintain, most convenient for ranching activities, and most profitable -- and often not where they are authorized. They run beside roads, lengthwise through canyon and valley bottoms, alongside waterways and drainages, along ridge tops, and across passes and saddles. Many bisect creeks and streams to provide water access to livestock in the numerous pastures that radiate out from water sources into the surrounding countryside. Thus, fences generally are concentrated where they most effectively interfere with natural processes, wildlife, and human visitors.

Wire fences on public land kill and maim many wild and domestic animals. Ranchers often complain about escaping calves and sheep, as well as adult cattle pushing through fences, so fences usually are built strong and tight, with close-spaced wires, the bottom wire close to the ground. Larger animals such as deer, elk, moose, pronghorn, and horses, in trying to cross fences, become entangled. Failing to clear the top strand, they may wedge a hind leg between the 2 uppermost strands and hang there to die from exposure or thirst, or to be eaten by predators. Or, in attempting to go under or through fences, animals may become entangled or pinch a leg in a tight spot. One study of the causes of accidental deaths of bighorns, for example, found 12% attributable to fences and other wire. Other bighorns were thought to have torn themselves free and escaped with serious injuries. (Ferguson 1983) Animals malnourished, diseased, or otherwise impaired due to ranching impacts are less able to negotiate fences.



(George Robbins Photo, Jackson, WY.)



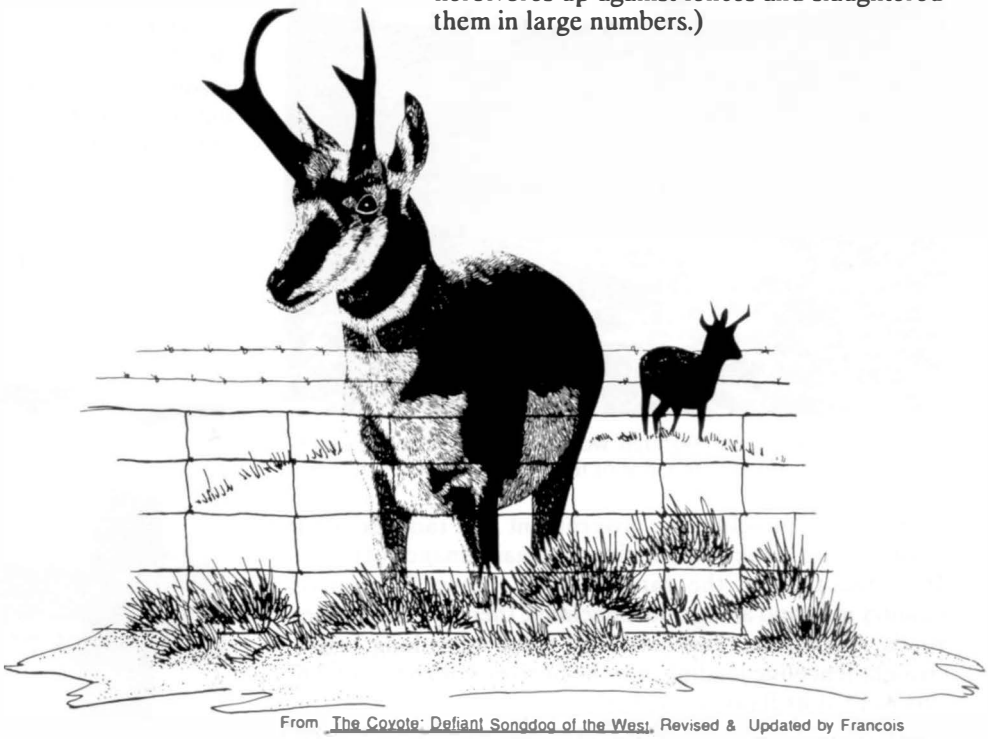
Where fences or other obstacles block movement, livestock often travel alongside in a parallel manner, one animal following another, creating trails. Other trails are formed where livestock move along common routes to and from water sources, salt blocks, shade trees, and forage areas. Thus have been created tens of thousands of miles of wide trails across the West -- representing hundreds of square miles of trampled, bare dirt. Note the fenceline contrast. *(SCS, USDA)*

Another problem with fences is that they impede migration and restrict free movement of many large animals, thus shrinking their territories and limiting access to key areas of food, water, minerals, mating, hibernating, etc. In fact, some ranchers build fences for the calculated purpose of keeping wildlife competitors off both their private property and "their" public lands allotments.

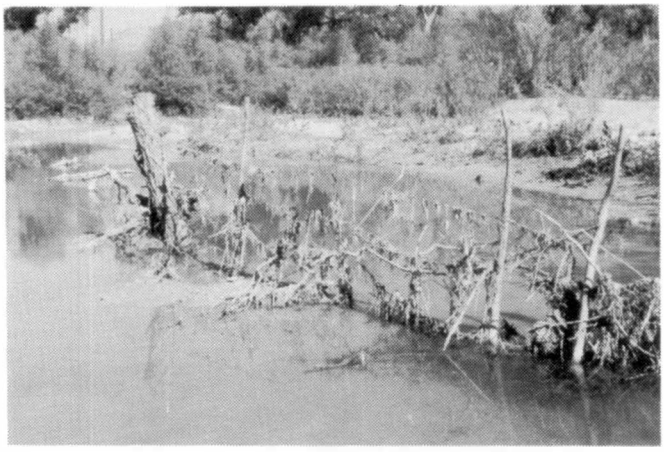
Pronghorn and bighorns are especially susceptible to being "trapped" by fences. When encountering a fence, they are prone to walk along rather than cross over. Thus, failing to reach necessary destinations, they sometimes die from thirst, starvation, or exposure. (In the early ranching years, market hunters purposefully drove herds of pronghorn and other large herbivores up against fences and slaughtered them in large numbers.)

Dogs, coyotes, foxes, bobcats, raccoons, and other large to mid-sized mammals likewise die lingering deaths. Even smaller animals may entangle their fur in single barbs, or collide with fences and wound themselves, opening their bodies to infection, disease, and parasites. Fence wire in water is especially injurious to beavers, muskrats, river otters, fish, and diving waterfowl. Fences straddling waterways and drainages may also catch large amounts of flood debris, causing jam-ups and consequent flash flooding.

Birds crash into barbed fence strands, often when the strands are concealed by vegetation. Especially vulnerable are large birds of prey, waterfowl, and large night-flying birds such as owls and nightjars. Sandhill cranes and even Endangered whooping cranes have been killed on fences on National Wildlife Refuges in Oregon, Idaho, and Colorado.



From The Coyote: Defiant Songdog of the West, Revised & Updated by Francois Leydet. Copyright (C) 1977, 1988 by Francois Leydet. Used by permission of the University of Oklahoma Press.



A cattle fence on the San Pedro River, Arizona. The washed-out portion in the background lurks underwater.

The public became aware of this problem only in winter 1983, when in southern Wyoming 700 pronghorn fleeing a series of blizzards stacked up against a barbed wire fence, where they starved and froze. The fence, enclosing more than 20,000 acres of private, state, and federal land, prevented the pronghorn from reaching their natural feeding grounds. Not wanting to remove the fence or modify its lower strand to accommodate wildlife and responding to a lawsuit by environmentalists, the rancher took his case to the Supreme Court. (A recent court decision ordered him to modify the fence's lower strand, but it remains to be seen if he will do so.) In recent years the government has in some areas provided "antelope guards" -- specially-designed grills similar to cattle guards emplaced along fences to restrict livestock but allow pronghorn passage.

Deer and elk jump most fences fairly easily, but like most large animals -- including bears, moose, mountain lions, and mountain goats -- they prefer walking along rather than going over, under, or through fences. Buffalo usually don't jump fences (though they are capable of it), but will push right through them, sometimes getting entangled.

(Brush Wolf)

To help confine sheep and reduce predation, sheep ranchers and government agencies have since the 1800s erected thousands of miles of net-wire fences across public land. This type of fence has been especially restrictive to some wildlife species, particularly pronghorn, which have consequently declined in many areas. For example, the *llano estacado* in southeastern New Mexico once supported one of North America's greatest pronghorn populations, but it crashed when a network of tightly woven sheep fences was erected on public lands in the area (Foreman 1991). Taxpayers have recently replaced some sheep fences with barbed wire, but thousands of miles remain.

Little recognized is that livestock grazing and roadside fences team up to cause millions of animal deaths each year. Most Western roadways are fenced to keep livestock off. The grazed countryside usually is barren compared to the luxuriantly vegetated, fenced, ungrazed roadsides -- hence the startling fenceline contrasts that confuse many a traveler in the West. Pavement runoff from rain accounts for much of this difference on downhill slopes, but the dramatic contrast usually begins exactly at the fenceline. Even on uphill roadsides, where runoff cannot reach, the contrast is usually striking. This difference is due to livestock grazing and is the cause of many wildlife deaths, for these lushly vegetated roadsides not only support a much greater number and variety of animals, but attract many of the surviving animals from surrounding, overgrazed areas. Mammals, birds, reptiles, amphibians, rodents, and insects concentrate there. As they run, crawl, or fly across roads, after being scared or simply moving from one place to another, they are hit by oncoming vehicles. Vultures, crows, ravens, coyotes, raccoons, and other scavengers seek out these roadkills and often become roadkills themselves.

A pronghorn finds lush early spring grass along a highway right-of-way, its overgrazed range in the background. *(George Robbins Photo, Jackson, WY)*

The photographer claims that this mule deer was hit by a vehicle while seeking the comparatively abundant roadside vegetation. *(George Robbins Photo, Jackson, WY)*

Fences may contribute to environmental decline in other, seldom understood ways. For example, studies show that in some grasslands and deserts lacking natural high observation points, fence posts may allow predators "too good" a view of nearby prey, thus leading to overkill and eventual decline of predators as well. Once again, ecosystem components are simply not adapted to artificial developments.

Though fences are already nearly omnipresent, the Forest Service, BLM, and others have launched a campaign to build an even more complex network, to eventually include *hundreds of thousands of miles of new fences*. Ostensibly to "facilitate resource management," the effort is actually a desperate attempt to maintain livestock production levels by creating ever-smaller grazing areas of ever-more intensive management.

Expansion of rotation systems as planned will require extensive fencing of western ranges in the years ahead. Each grazing area would be fenced into subunits to be rotated according to plan by the stockmen whose livestock graze it. In effect, the West would be extensively subdivided into pastures if these plans are carried out.

--Frederic H. Wagner, *Livestock Grazing and the Livestock Industry* (Wagner 1978)

Water Developments

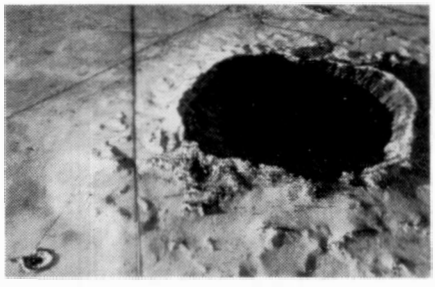
Every effort should be made to provide the water needed by livestock to fully develop the grazing potential of an allotment. This would include development of springs and seeps with known supply of season-long water, ponding of runoff, construction of ponds in areas of seasonably high water tables, or use of drilled wells or windmills. Some of these structures may supply only a few head of livestock with water for only a short time, but they will frequently encourage grazing in areas formerly unused.

--from "Managing Public Rangelands," a booklet by the US Forest Service

Stockmen discovered early that to control the range they had to control the water. Thus, through the Homestead Act and other legal, quasi-legal, and illegal means, most surface waters in the dry West became private property long ago, and remain so today. Ranches were established along almost every appreciable stream and in nearly every river valley in the rangeland West.

But cattle normally will travel only a few miles from water (sheep, somewhat further), and much of the Western range is farther from water than this, especially since so many natural water sources have been eliminated by overgrazing. Generally, livestock cannot survive more than a few days without water. Thus, without supplemental water it would be impossible to graze large areas of the West. Additionally, plentiful water allows livestock to consume coarser, less palatable, and more toxic vegetation (whose existence is also largely a result of overgrazing). So in dry and degraded areas water developments are spaced out evenly across the land to allow livestock more uniform and intensive use of forage and browse.

These artificial stock water sources, termed "tanks," dot the land like pepper on a map throughout all but the wettest regions of the West. (Look closely at a good Forest Service map and you will see, though many are not shown. Probably twice as many per unit of land pepper BLM land, though tanks usually are not shown on BLM maps.) Stock tanks commonly occur at an average of perhaps 1 per square mile, up to 4 or 5 per square mile in many areas. The vast majority of allotments have at least several tanks, and most have a dozen or more; thus, we may reasonably estimate **several hundred thousand** stock tanks on Western federal land. State and county lands are pocked with perhaps a couple hundred thousand more.

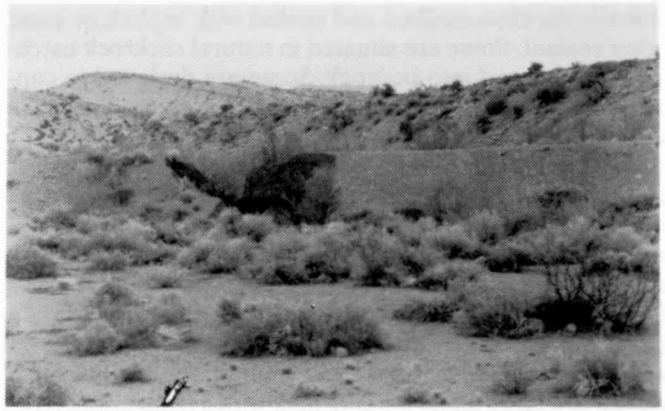


Mile-wide Meteor Crater near Winslow, Arizona on upper right; stock tank, lower left. *(Unknown)*

Most stock tanks are dirt. Ranging anywhere from bathroom-sized to acres in area, they are scraped into the living earth with bulldozers, backhoes, and graders. This often involves bringing heavy equipment across land never even driven on before. The dam site and area to be covered by water, and the ground 10' to 20' all around the site, are cleared of trees, stumps, brush, rocks, and other large objects, destroying animals and their habitat in the process. The topsoil may then be removed and saved to line the dam and spillway. Dirt, sand, and rocks (and remaining plants and animals) are gouged out to form basins and shaped into dams across draws, gullies, arroyos, canyons, and other drainages. Additionally, trenches and/or levees may be scraped into the uphill countryside to divert more water into the prospective ponds. In flatter areas without well-defined drainages, stock ponds are scraped deeply into the terrain, blocked with long, low dams on the downhill side, and fed with long swales, trenches, or levees that capture water runoff from large areas upslope. Some are lined with plastic, clay, cement, oil, and other sealants. But most are "puddled naturally" by the trampling hooves of livestock, and by manure, urine, washed-in silt, and a build-up of salts and minerals left by evaporating water. Infrequently, tanks are fenced to exclude livestock in order to reduce physical damage to the dam and to reduce water pollution (which may cause livestock to become ill or infested with parasites), and water is delivered to stock through a pipe or access point.

The dirt tank fills with water during a good rain, if the dam doesn't wash away or the basin fill with sediment. If it holds water (perhaps 10%-15% of those I have witnessed don't), thereafter it becomes a livestock mud-wallow.

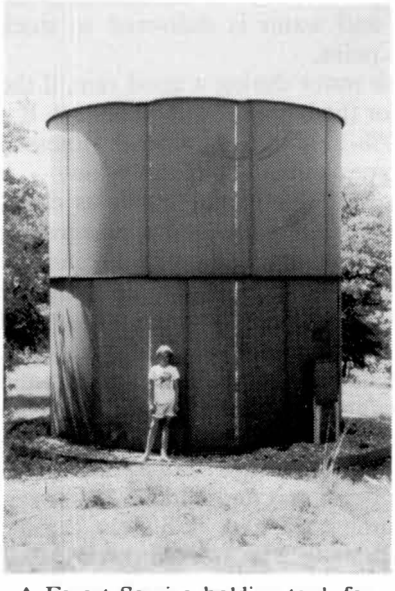
These tanks function partly and temporarily as check dams, as natural sediments and those loosed by overgrazing settle onto the bottoms of waters backed up behind the dams. However, the elevation difference caused by the dams (or *any* dam) also *increases* the water speed and scouring action of floodwaters in channels *below* the dams. This, in combination with the impact from overgrazing and tank building in drainages and surrounding areas -- plus the fact that livestock use and damage is extremely concentrated in tank areas -- usually leave drainages with significant net losses in vegetation, soil, and wildlife. Moreover, most tanks eventually (often suddenly) wash away, causing flooding and erosion to drainages far worse overall than if no tank were built in the first place. Thus, ranchers' claims of slowing channel erosion and providing for wildlife with stock tanks, though often palatable to the public, are usually the inverse of reality.



A washed-out large stock tank dam.

Constructing a large BLM dirt stock tank. *(BLM)*

Other common stock water tanks are metal, usually round and made from galvanized iron. These storage tanks, ranging in size from roughly a hundred to a hundred thousand gallons, commonly are fed via wells and windmills (invented in 1854), gas, diesel, propane, or electric pumps, or springs or creeks via gravity flow through pipes. Small open metal tanks may double as water troughs. Troughs may be built onto the bottom of large tanks, or located nearby and fed through pipes. Water levels in tanks and troughs are regulated by float valves. Like some other structural range "improvements," these metal tanks are sometimes flown into remote areas with government helicopters, allowing ranchers to graze otherwise unexploitable land.



A Forest Service holding tank for cattle.

Other stock tanks are constructed from concrete, concrete blocks, rocks, sheet metal, logs, or whatever material is available, then caulked and coated with asphalt or some other sealant. Some are situated in natural slickrock catchments or blasted into bedrock. Some are designed to capture rainfall directly and channel it into storage. These are termed "trick tanks."

One trick tank I encountered on Forest Service land was constructed thus: A gently rolling area of about 1 acre of juniper woods was stripped of all vegetation, bladed flat with a gradual slope to one side, and covered with a thick sheet of plastic and layer of gravel. Rainwater ran off into a funnel-shaped galvanized gutter and then over the side of a hill into a large metal holding tank supported by a platform of timbers. From this tank ran underground pipes, with valves, to a large metal holding tank with a trough, and from there to a concrete stock tank with a trough. The side of the holding tank was stenciled "PROPERTY OF U.S. FOREST SERVICE." A few cows were milling around in the surrounding acre of trampled, bare dirt. Who knows how much this project cost the public -- merely to help water 20 or 30 cows for a few months each year. Ranching contrivances such as this are common on public land.

Some stock tanks are even designed to capture windblown snow. This may include structural developments, bulldozing, and/or vegetation manipulation.

Where profitable, seasonal drainages are bulldozed to form dams, or dammed with concrete, sheet metal, lumber, rocks, logs, or whatever is available, and lined with plastic. Perennial streams are dammed (damned) similarly, with pipes or ditches sometimes running to stock tanks and troughs in more convenient locations. Springs are dug or blasted out, curbed, or capped off and the water piped to stock tanks or troughs.

A spring development; water is piped to a cattle tank some distance away. Note the roadside fenceline contrast, barren hillside, and cattle trail at top.

This rock and concrete cattle tank ties into the canyon walls. Note that the basin behind the dam has filled with rocks and gravel.

Where water is near but still inaccessible to livestock, they may be supplied the water with noisy and polluting water pumps. Or, wide trails may be cut through thick vegetation, rocky areas, or even down steep mountainsides

so livestock can reach the water. Pumping plants are installed to lift water from deep canyons. Commonly water is piped for miles onto the dry range. If all else fails, water may be *trucked* to the thirsty animals. *Any* water is fair game to stockmen, and little gets away unaltered, undepleted, or unpolluted in most of the West.

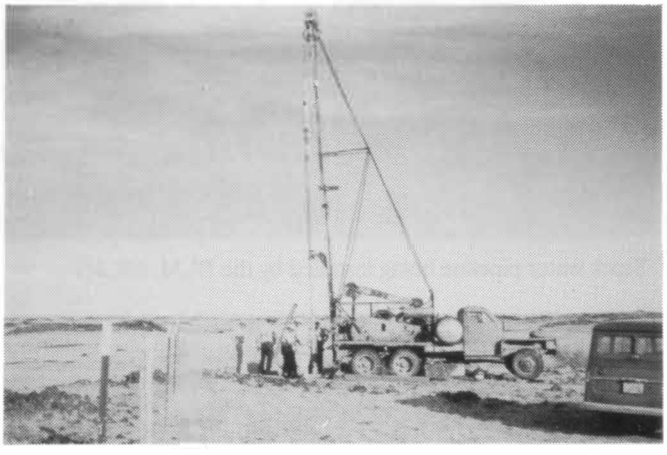
(On BLM land a permittee who pays to develop a water source may become sole owner of associated water rights, even to the exclusion of all others, including wildlife. This rule applies only to BLM ranchers. On BLM and most other government lands, "use-it-or-lose-it" policies encourage ranchers to develop and degrade natural water sources.)

A spring (indicated by the dark area at left) has been rerouted to a metal stock tank (right center), leaving the spring's channel dry. Sheldon National Wildlife Refuge, Nevada. *(George Wuerthner)*

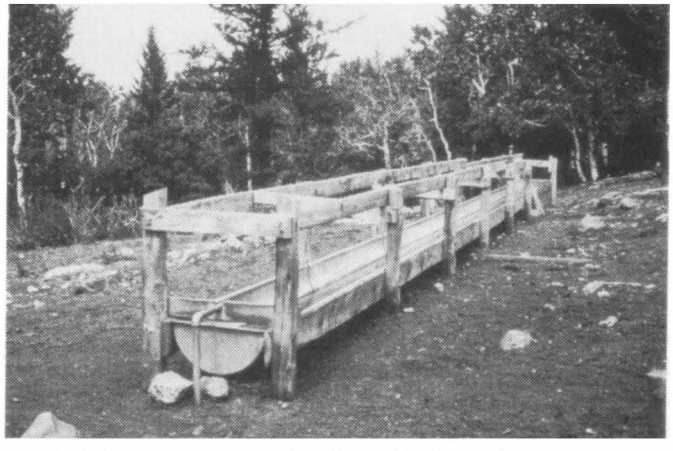
These metal cattle watering tanks are filled regularly during the grazing season with trucked water. *(BLM)*

This open metal stock tank is fed by a pipeline. *(BLM)*

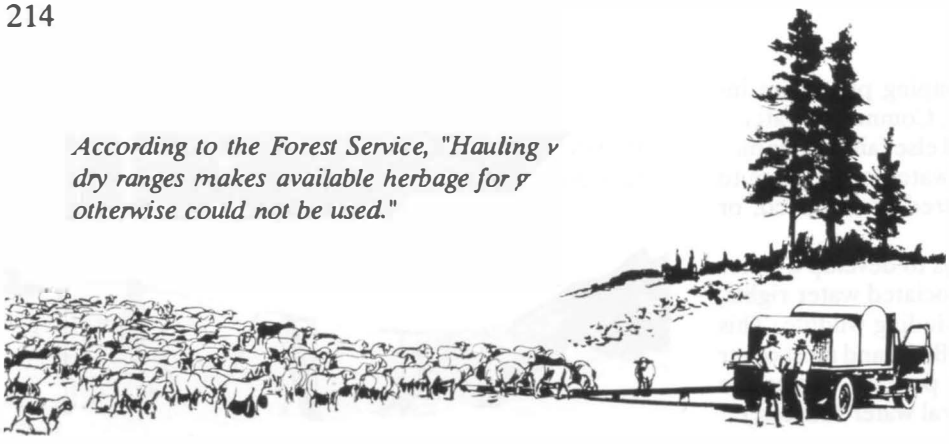
And this cattle tank is filled via a pipe at the center from a water truck that makes its rounds once or twice a week.



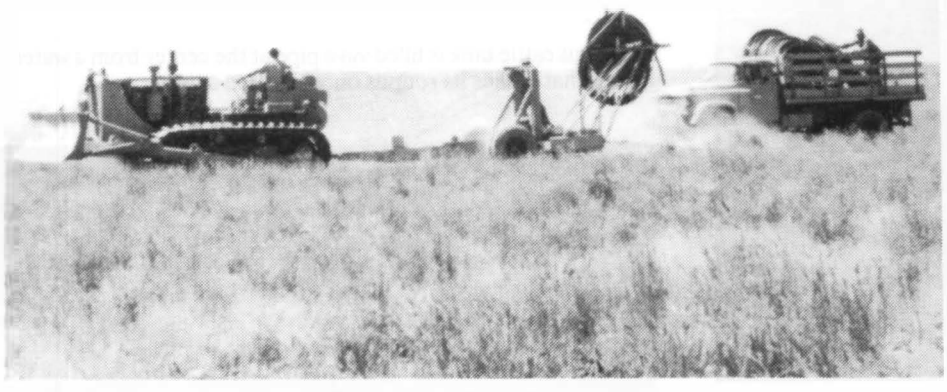
Well drilling in BLM's central Idaho lava country. *(BLM)*



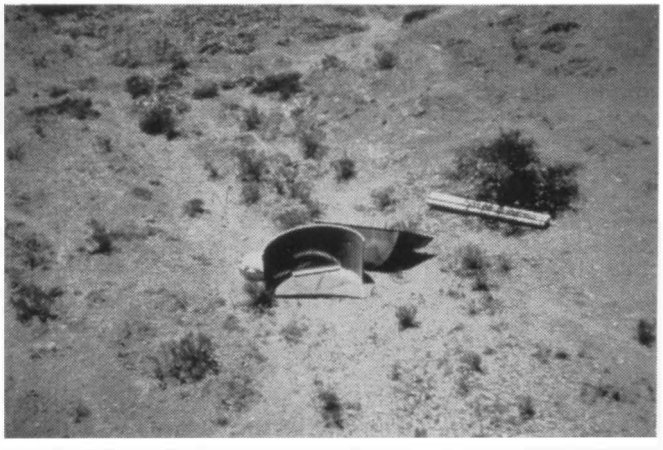
A BLM spring has been capped and piped to this cattle trough. *(BLM)*



According to the Forest Service, "Hauling v dry ranges makes available herbage for y otherwise could not be used."



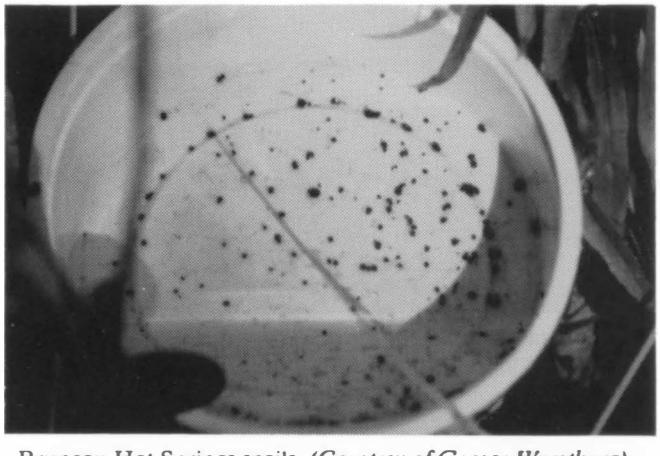
Stock water pipeline being installed by the BLM. *(BLM)*



Stock tanks and other ranching developments are sometimes helicoptered in to remote or less accessible areas. *(Jim Brown)*

On a larger scale, the various government agencies allow the development of many streams and rivers on public land for ranchers' use. Diversion dams, reservoirs, channels, dikes, irrigation canals, and holding ponds are all constructed on public land so ranchers can water livestock on public land and raise livestock feed on private land. These "improvements" frequently deplete most of a waterway's water and sometimes drain streams entirely, lowering water tables, further drying up springs and creeks, and so on.

For example, due to livestock production the Yellowstone River between Yellowstone National Park and Livingston, Montana (a 60-mile stretch), has only 2 instead of many tributaries whose flow still reaches the river through the summer; most water is diverted by ranchers, and the land's water retention capacity has been diminished by overgrazing (Wuerthner 1989). In Idaho's Sawtooth National Recreation Area (established by Congress in 1972 largely to protect anadromous fish habitat) water diversions for cattle pastures by the Busterback Ranch in late summer and early fall drain the entire upper reaches of the East Fork of the Salmon River. This stretch of river is described as once teeming with some of the world's farthest-ranging chinook, sockeye, and steelhead, but now these fish are rare. The Forest Service itself calls this "the single most important resolvable problem in restoring historic anadromous fish habitat in the state of Idaho." (Bagwell 1990) A Nevada rancher was recently served a cease-and-desist order to prevent him from continuing to take all water from a stream on public land and thereby eliminating miles of riparian waterway during hay growing season each year. And in southwestern Idaho, the Bruneau Hot Springs snail is being considered for the Endangered Species list chiefly because groundwater pumping by ranching operations in its range has lowered or dried up its springs (Wuerthner 1991).



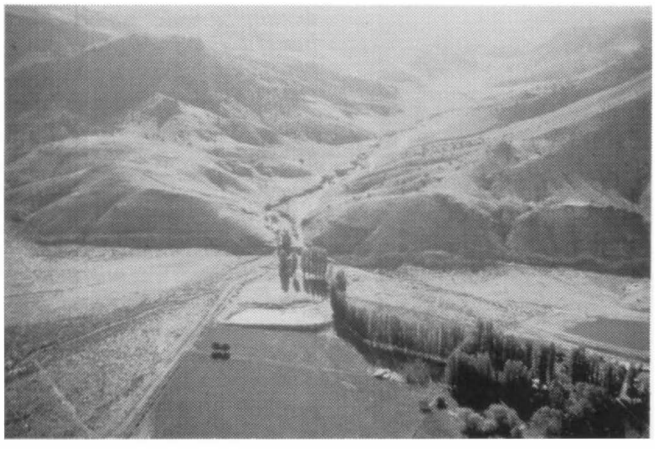
Bruneau Hot Springs snails. *(Courtesy of George Wuerthner)*

Water developments disrupt waterway dynamics, create the danger of dam-breaks and flash floods, release large amounts of sediments into waters, pollute waters with petroleum products, change water temperatures, block fish and other aquatic animal migration and movement, kill plants and animals, and more. For example, Rene J. Dubois of the Natural Resources Defense Council writes:

> *Channelization is a process which transforms streams into lifeless drainage canals. Bulldozers and chain saws denude the stream banks, while giant draglines cut new channels through the stream's natural bends, leaving behind piles of mud and debris. In most cases, adjacent wetlands are drained*

as well -- although they act as natural "sponges" absorbing floodwaters. Fish populations are virtually wiped out, waterfowl habitats are destroyed, and the recreational value of the streams is ruined.

In drought years, water diverted for livestock production sometimes reduces streamflow so drastically that fish and other aquatic animals are killed *en masse*. Such is currently the situation in Montana, where stock raisers are pushing the state to dam more streams, reimburse ranchers for leaving water in streams during dry years rather than use it for irrigation, and transfer water rights to stockmen outright. Already some Western state laws require that during drought ranching be given priority for available water, in some cases over all other uses.



A scene common to the rural West: the surface flow from this drainage is diverted for livestock pasture, livestock, and the ranch, leaving little or none for Nature and the public. *(Julia Fonseca)*

On an even larger scale, most major water development projects in the Western US were at least partially promoted by and now benefit the livestock industry, mostly to grow food for cattle. The massive environmental destruction and taxpayer waste caused by these water development boondoggles is the subject of other books, such as **Killing the Hidden Waters, Rivers of Empire**, and **Cadillac Desert**. In **A River No More**, Philip L. Fradkin relates: "Never in history has so much money been spent, so many waterworks constructed, so many political battles fought, so many lawsuits filed to succor a rather sluggish four-legged beast."

In the Northwest, livestock production accounts for over half of the water consumed in the entire region. Half of Arizona's water use is for livestock. According to a 1982 *Living Wilderness* article, 90% of the water taken from streams in the Colorado River basin is used for irrigation to grow hay and other crops for livestock (Wuerthner 1990b). Most of California's share of Colorado River water doesn't go to Los Angeles swimming pools but to irrigated pastures and cropland for cattle; overall, stockmen account for well over half of the state's water use. A recent federal hearings report on subsidized irrigation stated that 97.5% of Montana's water use was for some form of livestock production (Wuerthner 1991). Dr. Denzel Ferguson, co-author of **Sacred Cows**, reports that "Of the 100 billion gallons of water used daily in the U.S., 84% is used in 17 Western states, primarily to produce food for cows (Ferguson 1983)."

Livestock production accounts for *more than 70%* of water consumed in the 11 Western states (Hur 1985a). Moreover, in nearly half of the West (generally the most arid portions), in an average year *70% or more* of all surface water is taken, again mostly for livestock production (USDA, SCS 1981). In other words, considering these 2 factors and the loss of water flow caused by a century of livestock grazing, it becomes clear that without livestock production the volume of surface water flowing through about half of the West would be at least 2 and perhaps 3 or more times greater!

While ranchers have taken water for livestock production in most areas, they have intentionally decreased natural surface waters for livestock production in others. To utilize Western wetlands for grazing and haying, they have drained hundreds of thousands of acres of marshes, swamps, ponds, and wet bottoms -- formerly some of the most important wildlife habitat in the West. Most of this activity has occurred on private land, but its indirect effects have helped dry up public wetlands in many areas.

According to the photographer, this deep cut into a drainage in the Big Horn Mountains near Story, Wyoming, was caused by ranchers' misuse of irrigation water. *(George Robbins Photo, Jackson, WY)*

Meanwhile, back at the ranch:

Cattle visit stock tanks often. Here they congregate and spend much time, especially during the hot part of the day, lounging about, scratching, chewing cud. Thus, the area immediately surrounding tanks (springs, creeks, etc.) is severely trampled, devoid of ground cover, splattered with urine and littered with excrement. These places are commonly and rightly termed *sacrifice areas*.

The boundaries of sacrifice areas are usually well-defined as the extent of bare dirt around tanks -- commonly a radius of a few dozen yards. As the distance from tanks increases, livestock damage generally decreases, but definite impacts, associated cattle trails especially, are often discernable a mile or more away. A study at the Jornada Experimental Range in New Mexico showed that on unfenced range where stock tanks were spaced 7 to 11 miles apart, *most* vegetation was killed within 1 mile of tanks, about half was killed within 2 miles, and the impact was significant more than 4 miles away in all directions. In other words, almost the entire range was significantly affected.

A stock pond and the cattle drawn to it transform this draw's verdant landscape into a sacrifice area.. *(BLM)*

Ranchers are caretakers. In developing water sources we benefit the land, and we benefit the wildlife.

--Phelps White, past president, New Mexico Woolgrowers Association

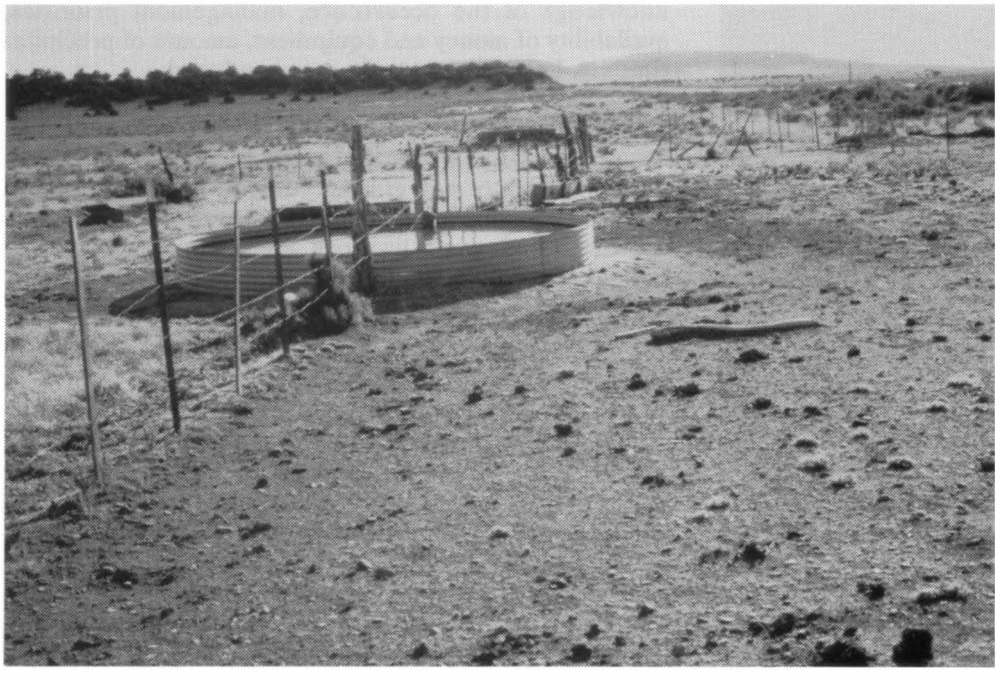
Sure, they can say they are bringing in a permanent water supply where it was only intermittent before [often because of overgrazing] *and that it helps wildlife. But they are putting it in so they can concentrate cows where cows wouldn't go before. Cattle stick pretty close to water, and they'll get all the grass and beat up the range. That's no benefit to wildlife.*

--Bill Meiners, retired BLM range specialist (Luoma 1986)

According to many ranchers and range managers, their water developments are "vital" to wildlife. Many stock tanks are even called "wildlife watering tanks" by those who think the public gullible. In reality, the vast majority of tanks are built primarily to help spread livestock into lightly grazed areas, where water is scarce and cattle and sheep seldom wander. These areas are, of course, exactly where many remnant wildlife populations survive -- a convenient coincidence to justify the new "wildlife" watering projects.

Wildlife tends to shun these stock tanks, which are usually little more than nearly sterile, viscous mudholes frequented by hordes of bellowing cattle. Many large wild animals

actively avoid cattle and/or sheep (and their smell), and thus tanks. Most small animals have been killed off or forced away from sacrifice areas, and many of those in surrounding areas may refuse to cross the wide "zones of nothing" around tanks, especially with livestock present. The sides of most troughs are too high for small animals to reach, anyway. Lucky for them; troughs and open metal tanks often become death traps to those birds and other small animals that do try to drink from them, fall in, can't get out, and drown. Few ranchers bother to provide "escape ramps," or even a simple stick from water line to trough or tank rim, which would save many of their lives. Needless to say, these dead animals do not enhance water quality.



To those few wild animals that can reach them and choose to use them, open metal tanks such as this may become death traps and purveyors of disease and parasites.

Indeed, stock tanks and the livestock frequenting them are ideal purveyors of disease and parasites to what wildlife does come around. The water of dirt tanks, in which cattle trample, defecate, and urinate, usually has incredibly high bacteria and protozoa counts, and the mucky, heavily trammeled area surrounding tanks often is rife with disease and parasites.

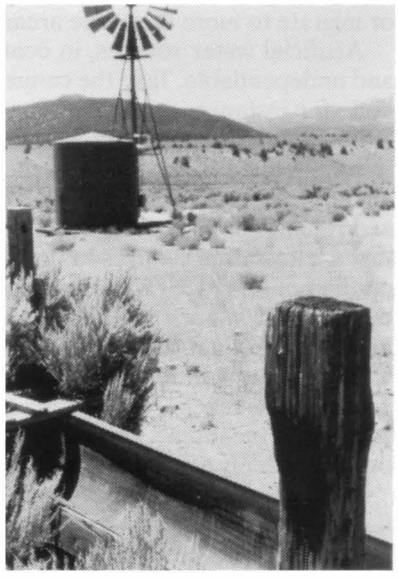
Many stock ponds contain heavy concentrations of harmful dissolved and suspended substances, causing health problems to livestock and whatever wildlife may use them. Manure, urine, minerals, salts, settled air-borne pollutants, toxic wastes, and sediments from surrounding sacrifice areas and degraded ranges are carried down by runoff and deposited in these artificial depressions. Because these stock ponds are devoid of plantlife and open to full sun and wind, evaporation rates are astronomical, and these harmful substances build up in ever-greater concentrations, while frequent livestock trampling keeps them dissolved or in suspension.

In the context given, ranching advocates' claim that wildlife needs these foul, unnatural water sources is patently false. Most large wild animals drink less frequently, require less water, and can travel faster to and further from water than cattle or sheep, and many small animals drink dew or extract or metabolize most or even all the water they need from the food they eat. On the other hand, livestock's depletion of the West's most succulent vegetation has caused some wild species to depend more heavily on drinking water to maintain hydration.

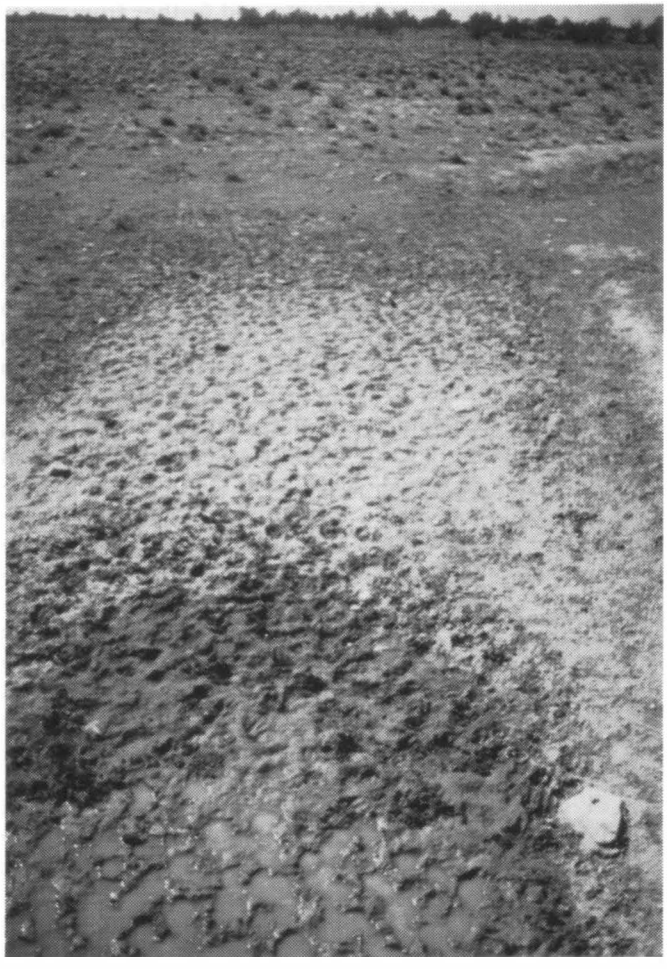
Whatever the case, many stock watering developments would not have been constructed if ranching had not depleted natural vegetation and water sources in the first place. In many areas, tanks partially replace water lost to overgrazing. But livestock monopolize and degrade this replacement water and surrounding areas. According to retired BLM grazing management specialist Hugh Harper, "We are treating the symptom instead of the problem." Building artificial water sources ensures that the real problem -- livestock grazing -- will be ignored, if not worsened.

In other areas, tanks have been built where there was no surface water originally. Thus have land managers been able to "produce" certain animals, usually small numbers of elk, deer, or pronghorn, in places where they would not normally live. As shown in countless areas where non-native animals have been introduced (e.g. mountain goats in Olympic National Park, pigs in Hawaii, burros in the Southwest, cattle and sheep almost everywhere . . .), it is not a good idea to bring either wild or domestic animals into areas where they and the ecosystems are not mutually adapted. This applies, for example, to winter grazing allotments where herds of sheep subsisting on snow seriously damage land normally lacking water for large numbers of ungulates.

From the standpoint of wildlife, stock watering developments differ from natural water sources in another important, but seldom considered, way: They are inherently *temporary and undependable* water supplies. Natural water sources



This obsolete BLM water development no longer produces water.



Most stock tanks are of little use to wildlife.

occur as long-established perennial surface flows, ponds, and lakes, or as intermittent -- yet relatively predictable -- springs, creeks, and ponds. Indigenous plants and animals have adapted to and depended upon these water sources for millennia. When changes in water availability did occur, they usually did so gradually enough that biota could adjust or migrate to more favorable areas.

Artificial water sources, in contrast, are nonpermanent and undependable. Take the common earth-fill dam type of tank, for instance: on the bottom of a small canyon in the hills of Southern California, a rancher uses heavy machinery to scrape out a basin and push the excavated material into a long dam across the drainage below. The basin soon fills and remains at least partly full from that point on. Assume that what wildlife survives in the grazed area comes to rely on the pond, natural water sources having been exhausted by cattle. Now, one spring day years later a snowmelt flood breeches the dam, and suddenly the tank no longer holds water. Soon thereafter, the cattle are moved to their summer pasture. The rancher doesn't repair the dam until December. In the meantime, the wild animals either die, or move out to suddenly overpopulate other areas.

Because most dirt stock tanks are built in overgrazed, flood-prone drainages, they trap large quantities of silt and other sediments. Animals, wild and domestic, sometimes get stuck and eventually die in the thick muck. Tanks often fill completely with these deposits within a few decades. At (or before) this point, the dams themselves usually begin to crumble and wash away under the erosive influence of livestock, gravity, the elements, and floods. Because tanks are degraded by livestock and support little or no vegetation, few roots exist to hold the sediments or dams in place, as in a natural situation. When a dam finally goes, the thick, loose sediment layers filling the basin wash away quickly. What is left is a sacrifice area worse than that created by the bulldozer and livestock in the first place. Such situations are in fact very common.

Dirt tanks must be rebuilt or repaired periodically. The same holds true for all other artificial water developments; they break down or are damaged. Water may not again be available for weeks, months, or years, depending on knowledge of the occurrence, management priorities, availability of money and equipment, amount of precipitation, etc. Less efficient tanks are abandoned.

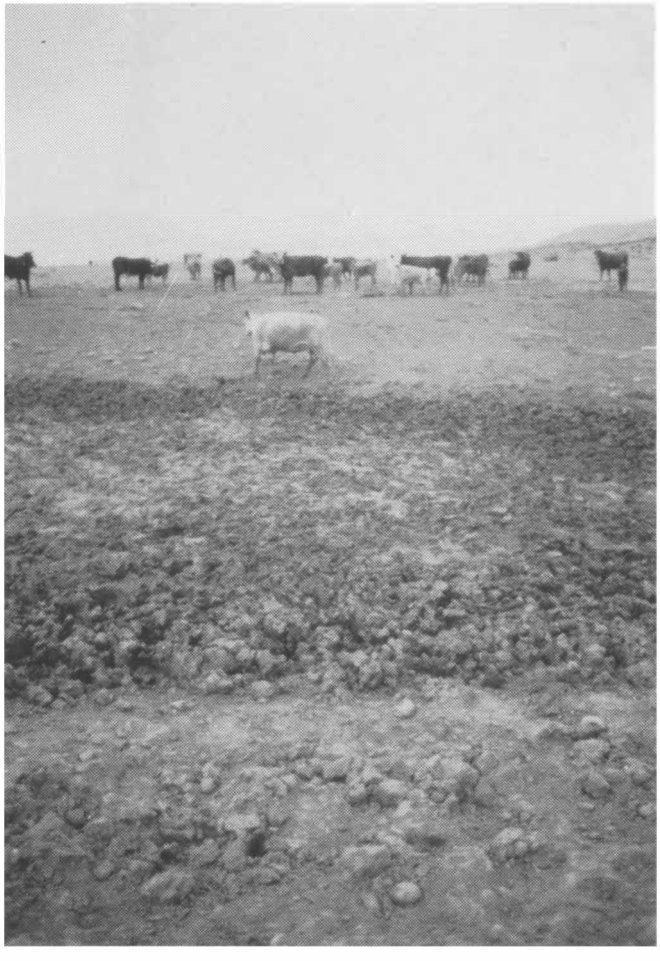
Many structural tanks are kept full only during grazing seasons, which on public land averages 4 months per year. Many other tanks are located inside corrals that are closed during periods of non-grazing. Most of the windmills and other water pumps that supply many water developments are turned off when livestock are elsewhere. In colder regions in winter, tanks that still contain water freeze over much more readily than natural water sources. To be of much use to wildlife, water sources must be clean, accessible, and dependable.

A washed-out stock tank dam on BLM land in central New Mexico. Note the size of the humans at top left.

Finally, stock tanks require an extensive network of roads for construction and maintenance, and fences to facilitate livestock utilization of the water.

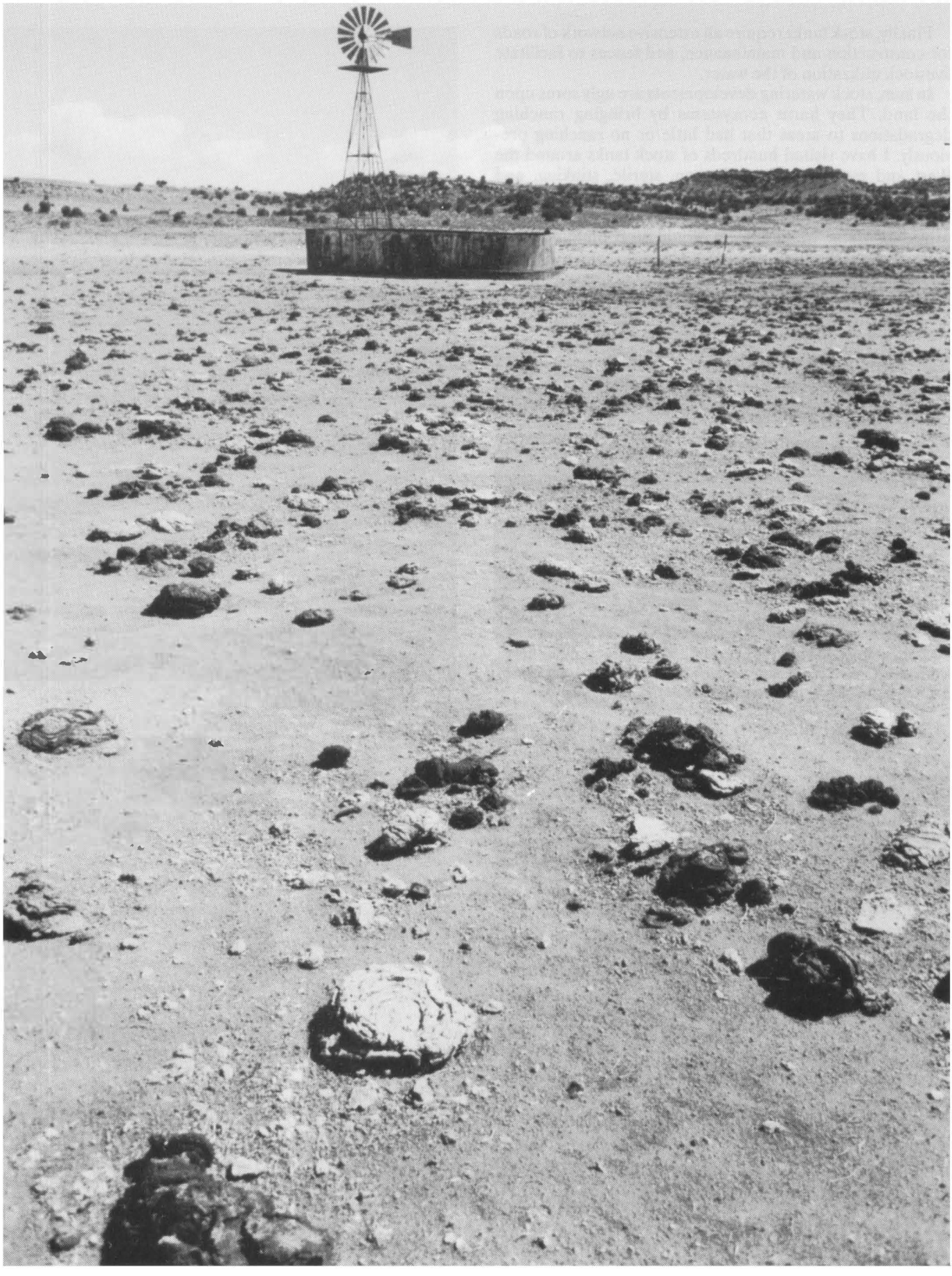
In sum, stock watering developments are ugly sores upon the land. They harm ecosystems by bringing ranching degradations to areas that had little or no ranching previously. I have visited hundreds of stock tanks around the West and most have been barren, sterile, stinking, and polluted. Rarely does one see more than a few birds and insects using them. If government was really concerned with providing water to wildlife, it would stop building stock tanks and end livestock grazing.

After denudation and trampling by cattle concentrations near this BLM water development, floods from an overgrazed watershed ravaged the drainage. *(BLM)*



Close-up of the bank of a typical dirt stock tank.

On the few months per year when this trough contains water, cattle drive off what few animals would use it; when the cattle are gone, so is the water.



Roads

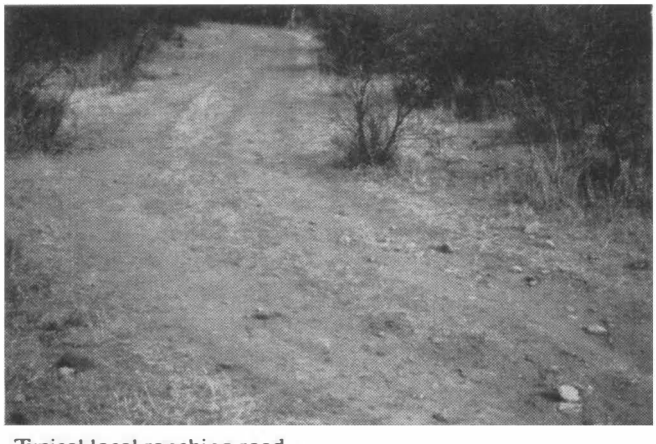
Cowboys weren't meant to walk . . ."
--Joe B. Frantz and Julian Ernest Choate, Jr., **The American Cowboy**

Ever wonder why so many gravel and dirt roads criss-cross the Western range? So many of them seem to have no real purpose or destination.

Well, wonder no more; most are ranching roads. More roads have been blazed, bladed, and blasted through our public land to benefit the grazing industry than for any other reason. This incredibly huge and complex road network is perhaps the least recognized but most destructive of the major range developments.

Over the years, each stockman -- with help from government -- has developed roads to access nearly every portion of "his" allotment. These roads are used for building and maintaining range "improvements," implementing ranching management programs, procuring natural materials used for ranching projects, hauling supplies and water, managing and moving livestock; roads also are used as ranching firebreaks, for access to ranches themselves, and simply as a means for ranchers to oversee their vast grazing domains. In brief, they make public land accessible to and usable by the grazing industry.

The Forest Service reports more than 375,000 miles of officially acknowledged dirt roads on our National Forests, not including county, state, and federal rights-of-way; most are for logging (Foreman 1989). Many more miles traverse BLM, state, and other publicly owned lands. Additionally, hundreds of thousands of miles of unofficial, unrecognized, or de facto roads cover public land.



Typical local ranching road.

Nearly all of the West's 30,000 or so public lands grazing allotments are criss-crossed with dirt, gravel, and (occasionally) paved roads, whose main and often only purpose is for ranching. Again, each allotment averages roughly 10,000 acres, or an area about 4 miles by 4 miles if square. We may reasonably estimate that maintained ranching roads traverse each allotment at least twice, accounting for 8 miles per allotment, for a total of at least 240,000 miles. The innumerable smaller dirt roads certainly cover at least this many miles, perhaps even an average of 1 linear mile per square mile, or twice this many miles. Thus, we may conservatively estimate that **0.5 million miles** of ranching roads exist on Western public land. This is more mileage even than for the Western public lands timber industry, whose roads are confined to comparatively small areas. Further, many timber roads are retired after logging has ceased, while ranching roads are almost always used indefinitely for ranching and other purposes. (This is not to minimize logging roads' overwhelming impact.)

Ranching roads wander along almost every valley and canyon floor, ridgetop, mountainside, plain, and plateau imaginable. In the grazed regions of the West, this vast, extensive road network provides access to almost every place grazed by livestock, leaving most of the West no more than a few miles from a road.

Many ranching roads on public land have existed for decades; some may now be used for other purposes, but generally their chief or only significant use remains ranching. Many other roads have been constructed in recent years by or with the permission of the government, usually in response to some perceived ranching need. When permission to build a road is not forthcoming, it can still be established under pretense of some other activity. For example, a rancher may obtain permission to clear a stock trail, path for a fenceline, or access to a fence post cutting area, whereafter the cleared corridor becomes the road originally wanted. New roads that access "public woodcutting areas" often become ranching roads.

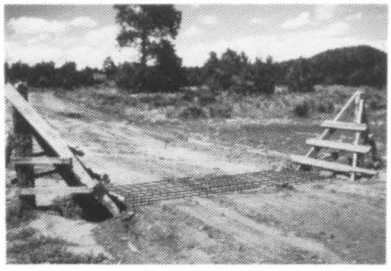
Many other roads are developed illegally. Some ranchers simply blade new roads wherever they want. Why bother getting permission from government agencies that often don't care anyway? Why worry about getting caught when this remote activity is rarely viewed or understood by anyone who would inform the authorities? In the rare cases where illegal road builders have been prosecuted, they usually suffer only a slap on the wrist.

Many more -- perhaps most -- ranching roads are created as ranchers drive cross-country along convenient routes, then continue using these same tire tracks until new routes are formed. Other motorists may follow their lead. Once established, these routes are treated more or less as sanctioned roads by government. When they wash out or are somehow obstructed, ranchers simply begin driving new routes instead.

Many muddy tracks parallel the ranching road on right.

Stockmen in 4-wheel drive pickups, jeeps, all-terrain vehicles, and on dirt bikes keep these roads in a general state of disrepair because they patrol the countryside frequently, and in all kinds of weather. Wet roads become rutted, eroded mud bogs, and dry roads throw up thick plumes of lung-choking, vegetation-smothering, air- and water-polluting dust. Being familiar with these roads (and of the macho persuasion), many ranchers normally drive them at high speed, throwing up gravel and rocks that pit and crack oncoming motorists' windshields and endanger lives. Their speeding heavy-duty vehicles create "washboards" -- numerous parallel small bumps on road surfaces that make driving difficult and cause vibration damage to vehicles.

This eroded ranching road has been rerouted on the left. Coconino National Forest, Yavapai County, Arizona.



Ranching roads combined with fences beget hundreds of thousands of tax-sponsored cattle guards.

Probably most stockmen drive their vehicles *off-road* habitually, in all kinds of weather. Suppose, for instance, Rancher Clyde wants to mend a hole in a fence (or check on cattle, shoot coyotes, cut fence posts . . .) a mile from the nearest road. No problem. Clyde jumps in his pickup, drives on a road as near as possible, puts the truck in 4-wheel drive, and drives cross-country to the fence. The mile-long set of muddy ruts he left concerns him not. But now he sees an easier route back to the road, so takes that way instead. Thenceforth, he uses this latter route to access the area.

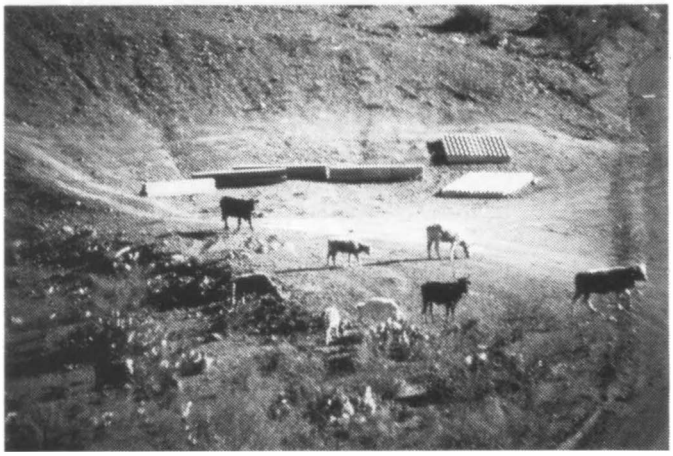
Though environmental damage from fences and stock water developments is enormous, that from ranching roads is more so. In fact, without the huge network of ranching roads, contemporary range development and livestock grazing itself would be nearly impossible.

Besides making it possible for extensive overgrazing and range development to occur, these roads have opened up huge areas -- *perhaps as much as half of public land altogether* -- to human access and abuse by a wide variety of interests. Consequently, woodcutting, hunting, plant and animal collecting, development, and off-road vehicle (ORV) use are occurring in many areas damaged by such activity. Littering, dumping of toxic wastes, theft of natural resources, artifact hunting, arson, and mindless vandalism are common along ranching roads. For example, according to ecologist Jasper Carlton, over half of human-caused "wild"fires begin along roads. Geologically fragile and botanically and zoologically sensitive areas have been opened up with reckless abandon, often with ruinous results.

The mileage and distribution of ranching roads is mind-boggling; these roads have opened up nearly every livestock-grazed area in the West (*most* of the West) to vehicular access and its destructive impact.

More than any single human development, ranching industry roads have aided the exploitation, development, and desecration of our public lands and the rural West.

Roads are themselves a substantial detriment to natural systems. First, every road is a sacrifice area. Each square foot of roadway is a square foot of biological void. Even a lone set of tire tracks across the landscape represents the denudation of about 1/8th of an acre per linear mile. Each linear mile of dirt road ruins an average of approximately 4 acres of ecosystem. Accordingly, Western public land's minimum of 500,000 miles of official and de facto ranching roads represents a bare area of about 2 million acres -- about the size of Delaware and Rhode Island combined.



A cattle guard awaiting emplacement in a highway through BLM land.

Many tons of topsoil have been excavated illegally from this site along a BLM ranching road.

Ranching roads promote all manner of environmental abuse, including illegal trash dumping.

To clear a ranching road through a riparian area, live and downed trees were bulldozed into this pile. Coronado National Forest, Arizona.

However, the overall physical impact is far greater than represented by these 2 million acres. Road construction activities kill plants and animals directly, and physically damage road sites and surrounding areas in many ways. Cut-and-fills are especially destructive as they displace and damage soil to a great depth, sever roots, destroy animals and their burrows, alter drainage patterns, and so forth. The steep slopes formed by cut-and-fills provide poor sites for vegetation reestablishment, and usually cause greatly increased water runoff and soil erosion, sometimes even landslides. Unless down to bedrock, the cut-out portion of a hill will expand until gravity and erosion finally level the slope beyond the angle of repose.

The eroded gash in this hillside is caused by runoff concentrated through a culvert under the ranching road at top.

Water infiltration through bare ground commonly is less than 1/3 that of comparable vegetated areas, so runoff from dirt roads is high. Soil damage is similar to that of extreme overgrazing. These factors combine to make dirt roadways prone to severe erosion. Many ranching roads are in fact highly eroded and washed away regularly. On steep, easily eroded slopes, they become gullies and arroyos. Roads are rerouted alongside these new drainages; eventually they too wash away and join together to form larger gulches. Runoff water and sediment from dirt roads adds to that of surrounding grazed areas, increasing sediment deposition.

Roads block waterways and drainages. Water often is rerouted through culverts or bridges, hindering or halting passage of fish and other aquatic animals. Flood dynamics are altered and drainage patterns upset. Because roads concentrate surface water flows, soil erosion downslope from roadways is accelerated, causing cutbanks. Upslope, drainages commonly are bladed and channelized with heavy equipment to funnel water through culverts.

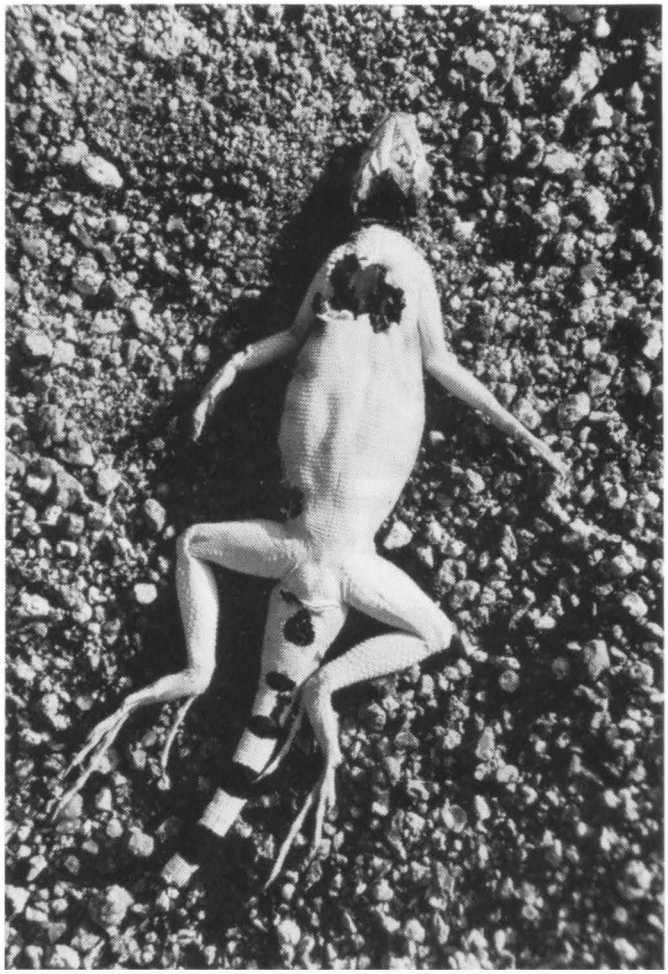
Culverts impede the movement of aquatic life, pervert drainage patterns, cause increased downslope erosion -- and allow destructive roads to exist where they otherwise could not. *(Steve Johnson)*

Roads hamper interrelationships, fragment habitat, and create edge effects. They act as barriers to the normal movement and activity of native animals. Some very small creatures will not or cannot venture across these barren zones at all. Many small mammals, amphibians, and reptiles avoid roads, partly because they may be more easily espied and picked off by predators when on barren roadways. Some large animals, including turkey, elk, deer, mountain lions, and bears, for psychological reasons -- mainly, they associate roads with danger -- avoid crossing roads whenever possible, and are thus hampered in movement. They exhibit decreasing densities toward roads; for example, studies show that road densities of 6 miles or more per square mile can cut habitat use by elk and deer by up to 100% (Carlton 1990). Burrowing animals and soil dwellers, including worms, insects, and soil microorganisms, are blocked or killed by frozen, sun-baked, and otherwise hard-packed roadways. In summer, road surfaces may become too hot for certain reptiles, amphibians, and others to cross. For some populations and species, all these effects may lead to genetic drift and inbreeding, and thus reduced genetic viability.

Roads serve as pathways for humans and corridors for the spread of their opportunistic plants and associated pests and pathogens, thus harming wildlife and natural systems. As well, roads may effectively hamper normal migration patterns of many plant species, depending on their methods of propagation. Roads act as dams and diversions to alter runoff patterns, thereby restricting water to downhill vegetation. The overall effect on plant life can be seen along some roads, where vegetation on one side is sparser and/or composed of different species than that on the other.

Vehicular traffic scares animals and upsets their normal activities. Moving vehicles act as barriers to animal movement. Exhaust from vehicles contains heavy metals, carbon dioxide, and carbon monoxide, all of which may have a significant cumulative effect on wildlife.

Wildlife and animal rights groups estimate that 1 million vertebrate animals are killed on roadways in the United States *each day*. Ranching roads on public land cause many thousands of these deaths, not to mention killing millions of invertebrates each non-winter day.



A zebra-tailed lizard joins the mass of victims killed by Western ranching roads.

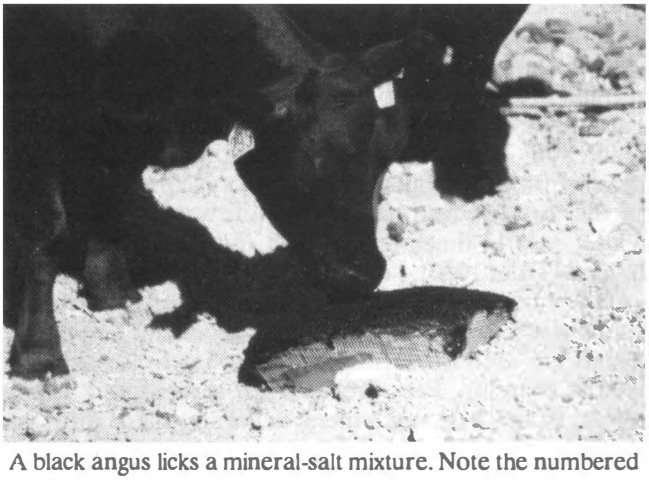
A large percentage of ranching roads must be wide and well-maintained to accommodate large stock transport vehicles. Ranchers require all-weather roads for well-drilling rigs, the transport of supplies and heavy machinery, and year-round access for ranching management and to ranch headquarters. Powerful ranching interests make sure their needs are given high priority in government road building and maintenance plans.

Indeed, as public lands ranching management becomes more intensive and range "improvements" more numerous, new ranching roads are being developed at an accelerated pace. Already, ranching roads are the single most destructive development on public land. If public lands ranching was ended and all associated roads decommissioned, what would soon follow would be one of the world's greatest environmental restorations.

Salt

Salt is a necessity to many wild and domestic animals, including livestock. A cow consumes 2 to 3 pounds of salt per month and will travel long distances to obtain the mineral. Ranchers are acutely aware of this and often use salt to coax cattle into less heavily grazed areas, in a manner similar to their use of stock ponds. In this way salt is used to distribute livestock more evenly over an allotment and thus to more fully exploit the range. In some cases this may, as claimed, lessen overgrazing in certain areas. More often, greater herbage utilization through salting simply means that a rancher spreads his livestock (sometimes *more* livestock) over more of the allotment, thereby further spreading livestock impacts.

Likewise, by moving salt in planned increments, herds can be moved about the range, such as between forage areas, away from poisonous plants, up behind the rising snowline in spring and down from the lowering snowline in fall, or toward corrals at roundup. Thus, salt is a tool of livestock manipulation and range exploitation. Under both BLM and FS regulations, decisions on salting are solely the permittee's, with essentially no restrictions.



A black angus licks a mineral-salt mixture. Note the numbered ear tags.

Salt for range cattle commonly comes as 50 pound blocks. White blocks are pure sodium chloride; other colors indicate the addition of various other essential minerals. Usually salt blocks are simply thrown on the ground in the desired location. They may also be set on flat rocks or tree stumps, or placed in specially constructed salt block holders or covered feed troughs to keep them from dissolving in the rain or moist soil. This also minimizes competition from wild animals.

For convenience, ranchers most often locate salt blocks near established ranching roads, but they will punch in new roads if they feel the need. *Many thousands* of dirt roads in the West lead to nothing more than a few salt blocks. Many ranchers drive off-road across the landscape, dumping salt blocks from the back of their pickups wherever they think it would benefit their operations, thus creating the beginnings of new roads as they go.

Salt blocks dumped only days ago are already becoming the center of a sacrifice area and surrounding range damage. BLM, southeast Oregon. *(Nancy Peterson)*

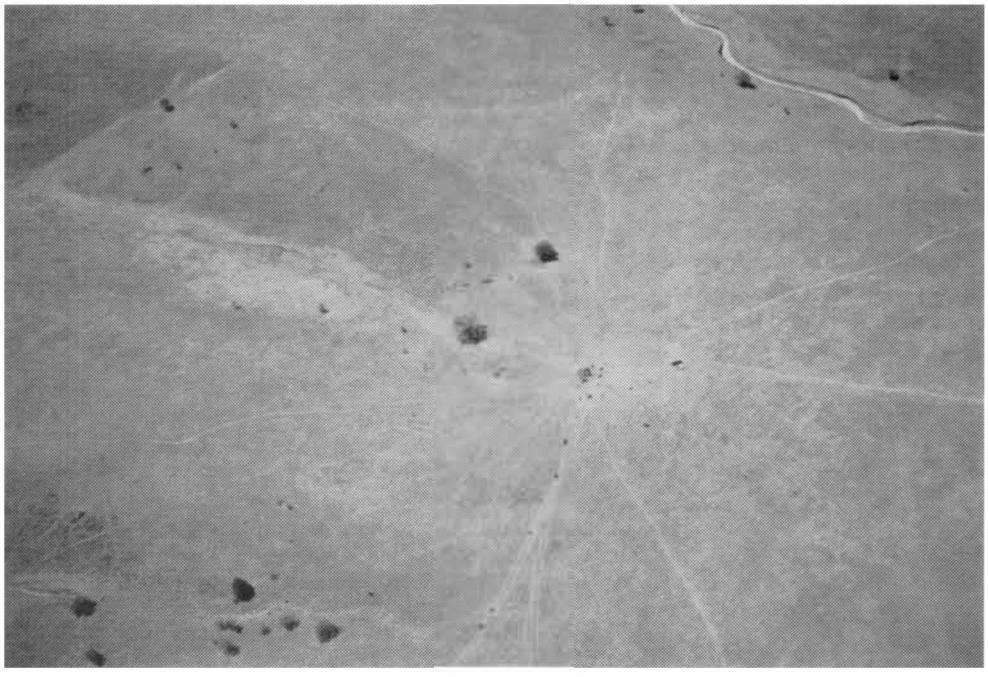
As with stock tanks, the areas around salt blocks quickly become sacrifice areas. Often covering acres, with numerous cattle trails radiating outward, many of these wastelands resemble wagon wheels when viewed from aircraft. Because trampling is so intense, and because salt tends to sterilize soil, damage may last for decades after an area is no longer used for salting livestock. *Hundreds of thousands* of salt blocks litter our public land, and each becomes the center of a sacrifice area.

Note: Bear in mind, however, that sacrifice areas are merely concentrated -- thus more obvious -- manifestations of livestock impacts. Even if livestock were distributed uniformly over the range, depending on circumstances, their overall impact may or may not be smaller.

Again, as with stock tanks, ranchers claim their salt blocks benefit wild animals and that without this salt much wildlife would perish. However, wild animals have been obtaining needed salt and minerals from food, natural licks, etc. since life began; there is clearly no need for ranchers to provide salt for wildlife.

They lie.
--Mike Roselle, activist

A wooden trough provides salt and supplemental feed to cattle, whose impacts are thus concentrated in this area. Note that the juniper, used by the cattle for shade, has lost all of its lower branches and is beginning to die. Gila National Forest, NM.



Aerial view of a salt block sacrifice area. Cattle trails radiate. Note the access roads at bottom center and the cattle (black dots). A wash stands out at upper right.*(Joanne Cockerill)*

Other Range Developments

Supplemental feeding creates sacrifice areas and exacerbates overgrazing.

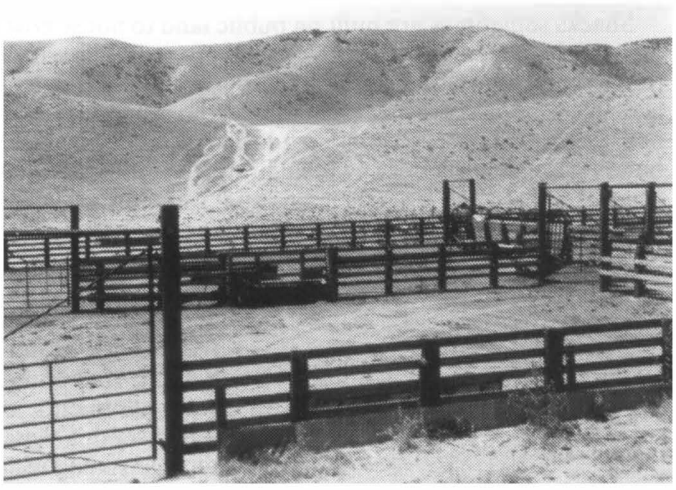
On a properly and lightly stocked range, livestock would theoretically obtain all necessary calories and nutrients from native plants. But because public ranges are vastly overstocked and livestock are grazed when, where, and how they shouldn't be, supplemental feeding is a common practice -- even on BLM land, where supplemental feeding is officially not allowed except for "protein blocks" and other highly concentrated supplements. (These concentrated supplements allow an animal's digestive system to utilize less palatable vegetation, thus intensifying overgrazing.) When range livestock become chronically hungry or deficient in certain nutrients, they must be provided with imported food, or they will suffer and die. Various feeds -- hay, alfalfa pellets, block, cube, and meal mixtures, sometimes mixed with salt and/or minerals -- are supplied to livestock in metal, plastic, or wooden feed troughs or thrown on the ground. All these areas, too, quickly become sacrifice areas -- localized wastelands. During hard winters or droughts, emergency supplemental feed is sometimes trucked in or dropped, at taxpayers' expense, from government planes or helicopters. BLM has been allowing long-term supplemental feeding on many desert allotments, thus allowing stocking levels in these areas to remain extremely high.

Water spreading is a technique of diverting flood waters from usually dry drainages onto the surrounding landscape with a system of dikes, dams, and/or ditches. Most water spreaders are long, low dikes bulldozed across wide, shallow drainages. Runoff is trapped and spread shallowly over a wide area behind the dike, with the intention of promoting forage growth, though it may or may not occur. Thousands of water spreaders have been built with tax monies on public land, many of them stretching across the range for a mile or more. Each one kills animals, scars the land with heavy equipment, displaces large amounts of topsoil, and robs runoff from downhill areas. Furthermore, their cost is not nearly compensated for by the increased amount of forage. Studies by the US Soil Conservation Service and the Bureau of Indian Affairs show only a slight increase in forage production, and that the costs to construct and maintain water spreaders are at least several times higher than the maximum benefits attained (Calef 1960).

Other range "improvements" on public land include *tens of thousands* of corrals, pens, and associated equipment. Corrals are used for sorting and handling livestock, especially at roundup. Pens are used for separating breeding animals from steers and heifers; dehorning, castrating, and branding; shearing sheep; dealing with sick or injured animals; holding work horses; and so on.

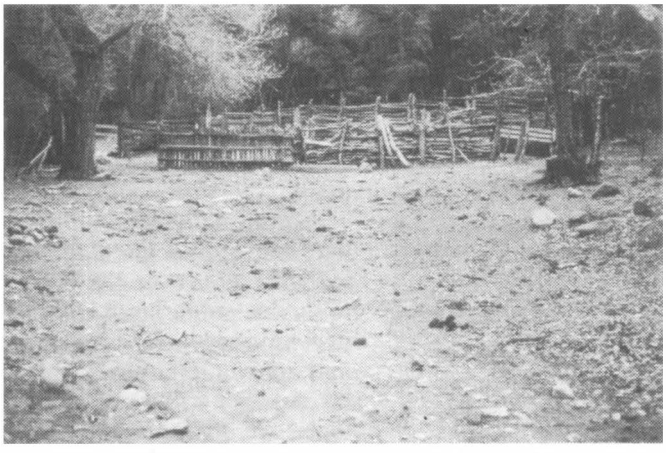
Within the corral area are chutes and loading ramps, and perhaps a scale for weighing. There may be a cattle "squeeze" for restraining animals; special compartments or chutes for spraying cattle and sheep with insecticides, fungicides, and fumigants; or a dipping vat for treating livestock for external parasites. Also within the corral area may be fences to funnel livestock into the corral; feed and water troughs; salt blocks; sun shades; and storage for fence posts, wire, oil, fuel, and other supplies.

The land in and around a corral becomes a super sacrifice area -- especially degraded by trampling, concentrations of manure and urine, spilled oil, fuel, chemicals, etc. With their large truck parking areas and tight networks of roads and cattle trails, most of these corral sacrifice areas represent the environmental obliteration of at least an acre, and, in many cases 5 or more acres of public land.



A corral in the (former) grassland of central California. Note the cattle trails leading toward the hills.

This corral under cottonwoods along the Rio Grande River, New Mexico, may seem pretty, but like all other corrals it is a sacrifice area. Ranching roads lead everywhere, there are no small cottonwoods, lower tree branches are gone, the ground is mostly bare, and cattle desecrate the nearby river. Stockmen often establish corrals in or near riparian areas for the purposes of easily locating water-oriented cattle, providing them herbage and shade, and procuring fence and corral building materials.



A corral made from cut trees and associated sacrifice area in dense forest, Kaibab National Forest, Arizona.

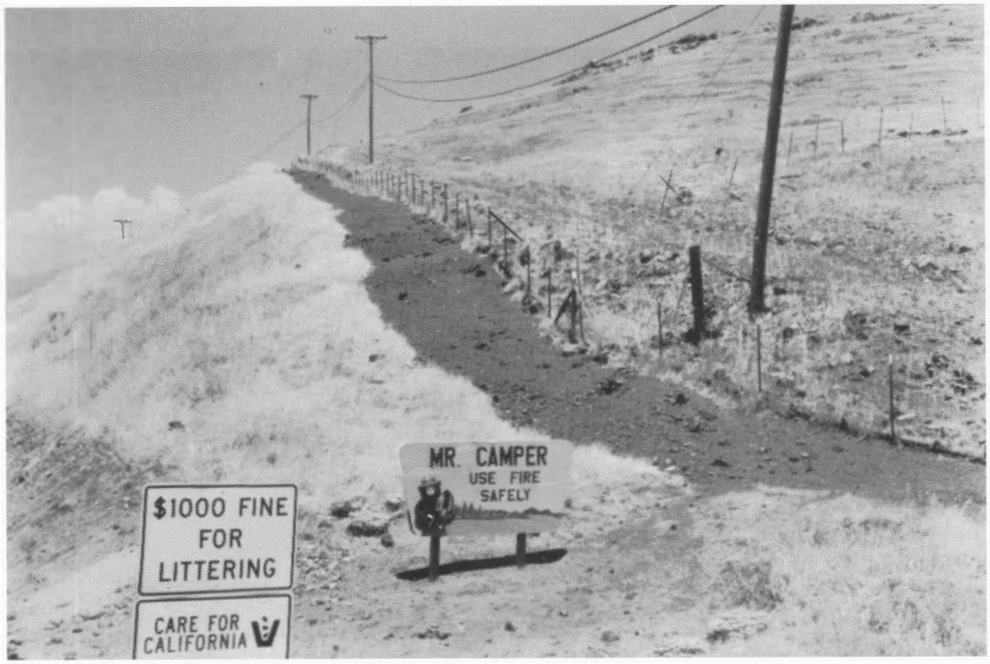
Where rivers, spring runoff, or deep gorges prevent sheep from crossing, government and/or ranchers build sheep bridges, some of which are quite extravagant. Similarly, where natural obstacles block rancher access, various kinds of cable crossings may be installed, again usually at government expense, often ostensibly for non-ranching purposes such as "public access," "fire fighting access," and the nebulous and baseless "to facilitate land management."

Tax-sponsored monuments glorify stock driveways on public land.

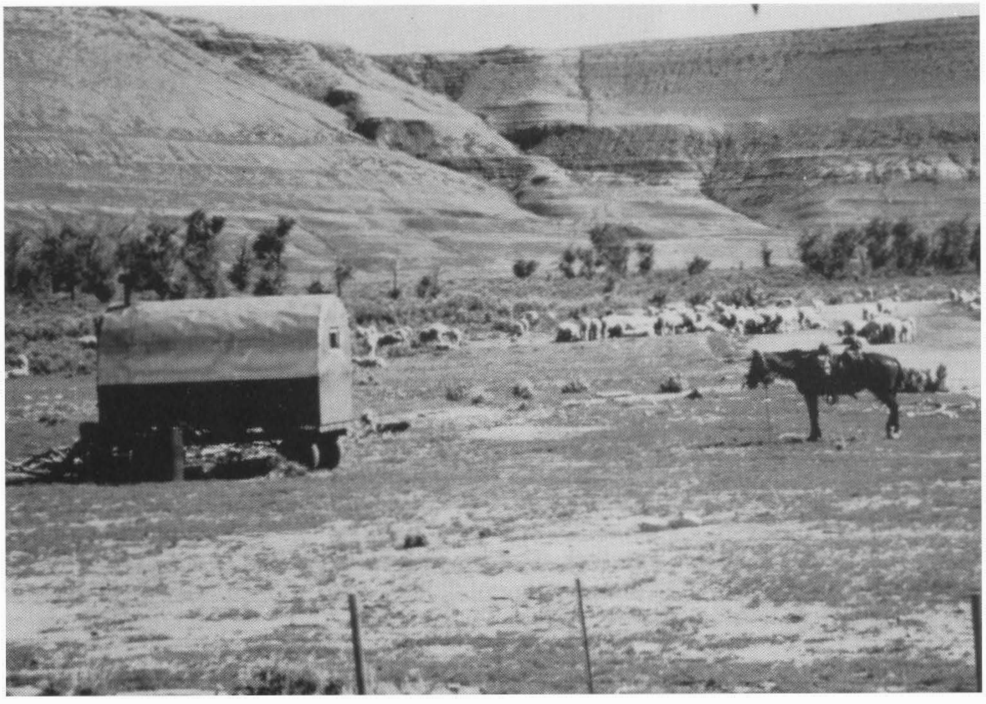
Stock driveways are wide, cleared zones allowing "trailing" of whole herds from place to place, usually from one grazing area to another or between ranch bases. *Stock trails* are simply trails used for the same purposes, though generally for smaller numbers of livestock. These "improvements" may be constructed anywhere a rancher deems it necessary to clear a path for more efficient movement of livestock, often through areas of rockiness, timber, or brush. There are tens of thousands of miles of stock driveways and stock trails on Western public land, which are in effect tens of thousands of acres of sacrifice area. Their environmental impact is similar to roads.

Ranchers cut or blast stock pathways into steep slopes and notches through obstructing steep-sided ridges, cliffs, saddles, rims, etc. to allow livestock passage. They cut openings through streamside vegetation and cut stream banks down to allow livestock access to water. They slash their way

through thick forests and dense undergrowth. They even build "walkways" of firm ground into marshes, wet bottoms, and areas of overflow so cattle have access to as much forage as possible. Stockmen also cut and remove vegetation and displace rocks and soil to make trails for themselves and pack trails for their horses, so they may more easily move about allotments.



A firebreak along a roadside fence. Ironically, the grass on grazed side is generally too sparse to carry fire!



A semi-permanent sheep camp on BLM range near Lovell, Wyoming, becomes a sacrifice area and helps spread overgrazing to the surrounding area. Hired cowboys live at these camps for weeks at a time. The agencies tell us that to prevent damage from long-term use, no one may spend more than 2 weeks in any one location on BLM or Forest Service land -- no one but stockmen, that is. *(George Robbins Photo, Jackson, WY)*

Shacks sometimes are built on public land to house cowmen or sheepmen attending to business in remote parts of the range. Range riders develop temporary and permanent campsites, often removing vegetation in the process, cutting and filling soil, constructing crude log or rock shelters, building fire rings, depleting local firewood, and scattering trash about -- thus creating human sacrifice areas. Their horses further deplete vegetation and trample soil.

Range fixtures also include tens of thousands of stone, metal, and concrete monuments that mark the boundaries of grazing allotments, as well as metal and wooden signs. Most are built or installed with tax dollars.

Tens of thousands of miles of firebreaks scar Western rangeland. Whether bladed, herbicided, or disced, the environmental impact is similar to that of dirt roads. And, as discussed, the ranching industry's great reduction of natural fire has been one of its most destructive influences.

Range "improvements" also include developments designed to restore livestock productivity to land degraded by livestock. This would include, for example, contour furrowing of overgrazed hillsides to reduce soil erosion and help reestablish forage. Other restoration developments include contour trenching; terracing and terrace stabilization; check dams and instream structures; rip-rap on banks; grass seedings and plantings of shrubs, bushes, and trees; and range fertilizations. Though all of these developments and more are necessitated by and constructed to improve livestock grazing, they are rarely directly linked to livestock grazing in government land management plans.

Additionally, phone, electric, water, and gas lines run long distances over public land to service public lands ranches, necessitating utility corridors and concomitant environmental damage. Considering that there are 30,000 base properties (not to mention auxiliary operations, electric pumps, etc.

out on the range) spread more or less evenly across the rural West, necessitating *tens of thousands* of miles of utility lines and service roads, environmental damage from just the utility services for public lands ranching is clearly enormous.

The grazing industry is responsible for a bewildering array of other developments, contrivances, and environmental alterations which degrade our public land -- too many to detail here. For example, snow fences may be constructed on public land to protect developments such as corrals, pumphouses, and ranching roads. Wood, metal, or rock shelters protect livestock from winter storms. Even wind-blocks for livestock may be built; researchers are currently testing designs such as V-shaped and semi-circular high, solid fences.

Some "improvements" are so lacking in realistic justification that they may be considered little more than environmental vandalism. Actual examples include cutting down an entire pinyon tree to get a good fence post from the top, bulldozing a stand of brush so cattle may be more easily *seen* on the other side, and taking a chainsaw to a large, dead tree because the stump made a good place to set a salt block.

Range Management

Fences, tanks, roads, salt, corrals, and other "fixed" developments are one form of what the ranching establishment commonly terms "range improvements." Another involves general manipulation of the environment, and is perhaps more properly called "range management." This includes eradicating unwanted vegetation, seeding rangeland, killing predators, and so forth.

In their century-long effort to force the environment to conform, stockmen have offered a remarkable range of suggestions for range management. For example, some ranchers think the government should destroy entire forests to enhance their livestock operations. Some would seed whole allotments to exotic forage grasses. Many propose killing every large predator in their state.

What has actually occurred would shock most people. Most Western public land is subject to range management, and already a large percentage has been developed for ranching, the vast bulk utilizing our tax dollars. This ranges from national soil conservation programs, to state-assisted brush eradication projects, to county aid in poisoning gophers on a 5-acre piece of land. All have one thing in common: they pervert Nature to benefit ranching.

Plant Enemies

With the zeal of missionaries bringing The Word to heathens, range "scientists" are busy justifying the annihilation of certain ecosystems. This holy war is being fought with chainsaws, bulldozers, chains, torches, poison, and, like all wars, lots of propaganda. An entire vocabulary of pejoratives surrounds these efforts at biocide . . . . This rangespeak bears as much relation to science as the rantings of the new right evangelists bear to philosophy and logic.

--"Le Chat Noir," an environmentalist

As we now know, during the past century and a half livestock grazing has severely reduced or eliminated most native forage plants. Be that as it may, before Euro-American settlers arrived much of the West was covered by livestock-unpalatable vegetation. Forage plants were certainly important components of most vegetation regimes, but often other species were significant or dominant. Nonetheless, ranchers and range managers proceed blindly, assuming forage grasses are the ultimate goal for any landscape. (Of course, livestock consume a great variety of plants, but grass is the most profitable.)

We also have the dubious distinction as well regarding the number of species of undesirable vegetation. Let me list some of them: 1. Pinyon and juniper 2. Creosote bush 3. Mesquite 4. Cholla (pronounced CHOY-YA) 5. Oak shinnery 6. Sagebrush 7. Prickly pear.

--David W. King, President, New Mexico Association of Natural Resource Conservation Districts (USDA, USDI, CEQ 1979)

Consider the terminology used by vested interests to describe plants they don't like: "worthless," "unwanted," "unacceptable," "undesirable," "inferior," "rank," "overgrown," "overmature," "noxious," "poisonous," "decadent," "weedy." "Undesirable" to what? "Inferior" for what, and to whom? Why are plants "rank" when allowed to grow up closely together as they normally do instead of being eaten by livestock? Is a plant, any more than an animal, "overgrown" when reaching full size? When it gets old, is it "overmature," not deserving of life? (Is Grandpa "overmature"? Should he be put to death?) Why are plants termed "noxious" or "poisonous" when many animals other than cattle and sheep eat them? Can plants be "decadent"? What, really, are "weeds"?

Most of these terms would be laughable if not so widely accepted. We have been indoctrinated to believe that non-forage plants on rangeland are inherently "bad," that they have no justification for existence.

They [native "increasers"] *are stable because millennia of co-evolution provided a full complement of native pathogens and debilitating creatures to limit these plants.*

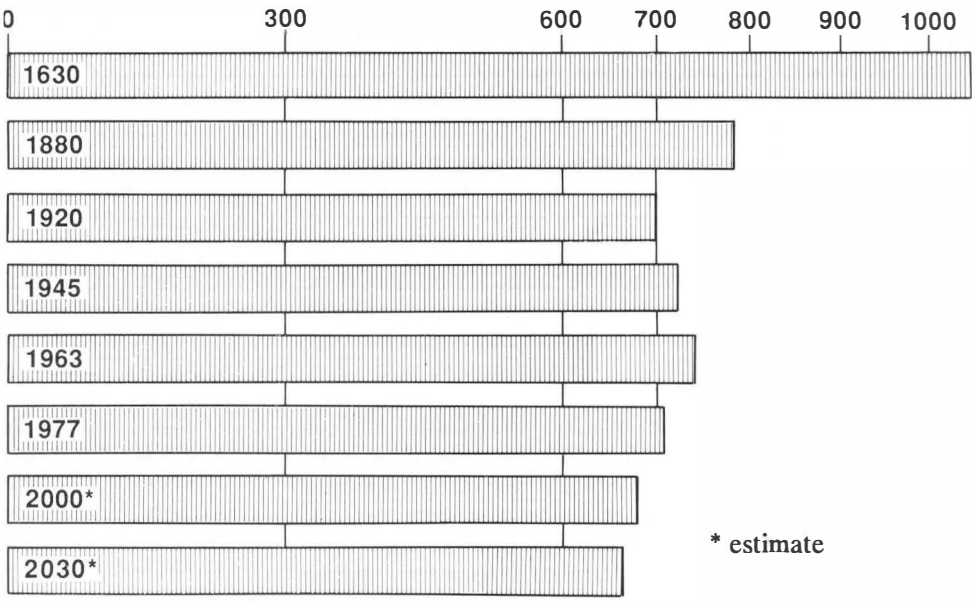
Nevertheless, because they are economically undesirable -- because we wish they weren't there -- much propaganda still portrays them as rogue organisms that have broken out and will destroy range, wildlife and the Western Way of Life if not beaten back by technology.

--Sam Bingham, "Barbarians Within Agriculture's Gates" (Bingham 1990)

So strong is our society's ranching orientation that we have been convinced that non-forage plants are not only bad, but even unnatural. To hear many ranchers talk, one would think these plants were practically nonexistent when livestock arrived in the West. Forbs, flowering annuals and perennials, and other non-woody, non-forage plants, they say, were "transitional" in nature, occurring only rarely where some major disturbance had temporarily cleared off the otherwise omnipresent grass cover. Supposedly, brush, shrubs, cacti, yucca, ocotillo, and other woody plants occurred naturally only in small stands in rugged terrain. Junipers and pinyons, they tell us, used to grow only in tiny

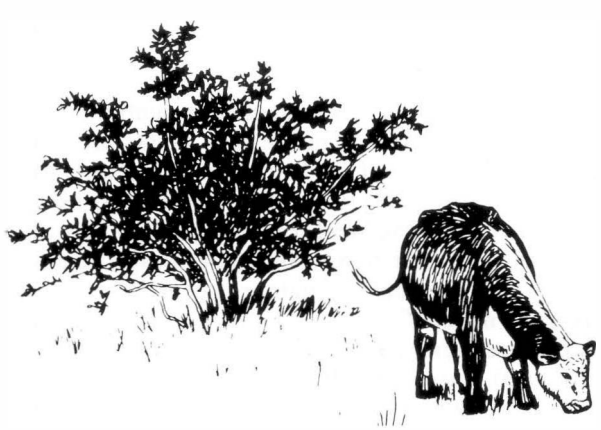
stands on steep hillsides and rocky ridges. According to many of these people, even the West's coniferous forests have expanded greatly in size. These assertions correctly or partially apply to some areas, but as blanket statements they are ridiculous.

Ranching promoters have painted themselves into a corner. On one hand, they insist that non-forage vegetation is native to only tiny portions of the West, that because of this most of the West should be managed for forage vegetation almost exclusively -- that is, for livestock forage. On the other, they don't quite know how to refute the overwhelming evidence that livestock grazing is what eliminated most forage in the first place. To escape this quandary, the industry has over the years developed a number of scapegoats: climatic changes; invasion of woody and weedy vegetation (it's the plants' fault); fire suppression; human causes; natural causes. The falsity of these claims is demonstrated elsewhere in this book.



US LAND AREA IN FOREST (millions of acres)
(Source: US Forest Service) Note: This graph merely reflects acreage in trees, not forest *quality*.

Then again, many ranching advocates don't even bother with explanations or justifications. They see the West as a giant board upon which they play "Vegetation Manipulation for Maximum Profit." These people see the world as merely a collection of resources, and with themselves as managers of those resources for whatever goals they choose. What is natural doesn't matter. There need be no rationalization for manipulating ecosystems, for it is their manifest destiny to direct all natural processes towards their goals. This reality is unfortunately common to our modern world, from former Interior Secretary James Watt, who said that we may as well use up the world's resources now because Armageddon is coming, to range consultant Allan Savory, who insists that livestock can be used to mold the Earth into virtually anything we choose it to be, to the typical BLM range manager, who embraces some degree of both.



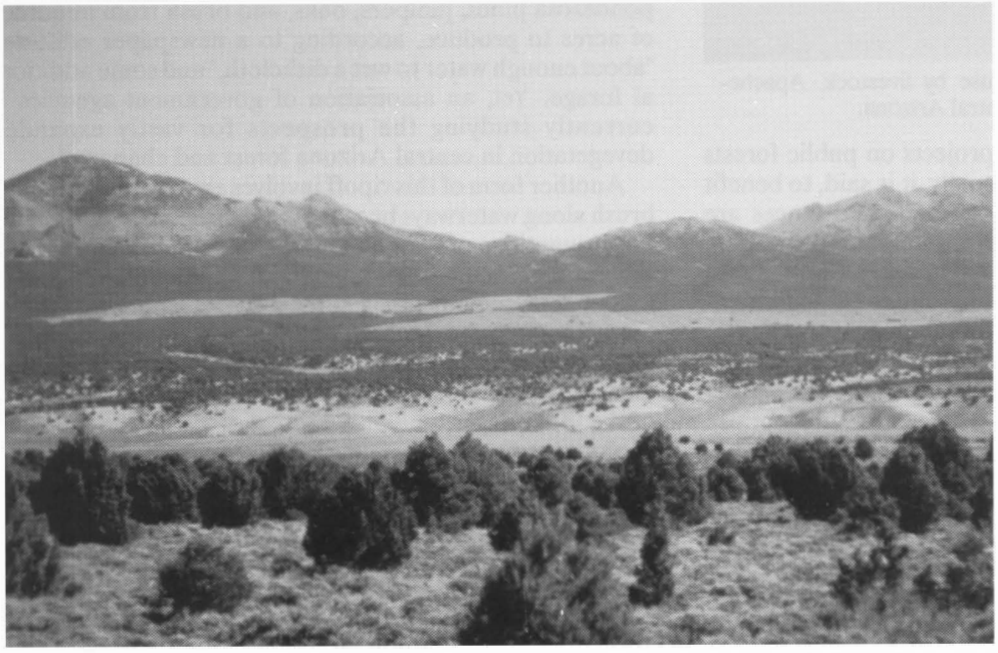
In many areas of the Forest, livestock graze in and adjacent to timber sale areas. Timber harvest removes woody vegetation allowing shrubs and grasses to increase for a period of time before trees become dominant again. The extra forage produced during this period can be used to increase cattle...
--US Forest Service

The grazing industry's plant enemies fall into 3 main groups -- trees, "weeds," and brush. That trees are natural to much of the Western landscape stockmen cannot deny, nor would the public tolerate the denuding of whole forests simply to create more livestock pasture, as they do with brushlands and "weed" areas. Besides, most Western forests provide a tolerable amount of livestock herbage anyway; widely-spaced trees allow plenty of sunlight to reach the forest floor, usually providing for a good covering of forage and browse plants. On open rangeland, a few trees per acre is even considered desirable as summer shade for livestock. Nonetheless, ranchers prefer to maximize profits by minimizing sun-blocking trees. Toward this end, they have for decades cut, ripped, burned, poisoned, and generally killed trees. In "Forest Land Grazing," Kingery and Graham relate that, "In the past, carrying capacity for livestock in forested areas was routinely increased by removing tree cover." The federal government reports that more than 260 million acres of US forests have been cleared *specifically for livestock* -- an area nearly the size of Texas and California combined.

This ranching deforestation continues today. John Robbins explains in **Diet for a New America:**

Since 1967 the rate of deforestation in this country has been one acre every five seconds. Many think our forests are being cleared to make room for urban development. But in fact, for each acre of American forest that is cleared to make room for parking lots, roads, houses, shopping centers, etc. seven *acres of forest are converted into land for grazing livestock and/or growing livestock feed.* (Robbins 1987)

More than 2/3 of the 70 million acres of US forest cleared between 1967 and 1975 was converted to grazing land, and most forest clearing still is for livestock production (Akers 1983). While much of this has been in the East, forests there generally regrow and heal more quickly than in the West. And while Eastern deforestation is generally more openly geared toward livestock production, Western stockmen needn't be so directly involved; as mentioned, most Western forests are naturally more open and sunny, and, moreover, the government and other land users do most deforestation for them.



Two half-square-miles deforested primarily for cattle grazing. BLM, Beaver County, western Utah.

Thinning slash piled and ready to burn -- in preparation for increased livestock grazing. Black Hills National Forest, eastern Wyoming.

On public land, the various governments conduct forest thinning, herbiciding, and prescribed burning -- usually ostensibly to benefit forest health or timber programs, sometimes openly to promote livestock grazing. Whatever the expressed or actual purpose, these programs benefit the ranching industry. Most forest areas with commercial quality timber have been logged at least once, many areas twice or thrice. Livestock grazing potential is a strong consideration behind many government timber plans, though this is rarely acknowledged, and, by the agencies' admission, logging is a main component of government long-range plans to expand grazing. The agencies often allow increased grazing in logged-over areas, especially clearcuts. Once logging opens up a forest area to allow a certain level of grazing, ranching interests do their utmost to keep the area as sparsely-treed in the future. At times this has resulted in conflicts between ranchers and loggers, but the level of grazing possible and allowed on most logged public forests is sufficient to keep ranchers satisfied.

Thus, other than the timber establishment, the grazing establishment is the strongest influence behind denudation of public forests. According to the USDA's *An Assessment of the Forest and Land Situation in the United States*:

> *Significant opportunities to increase range grazing occur on portions of the 488 million acres of commercial forest land. Commercial harvesting of mature tree stands will often result in temporary (5 to 10 years) production of grasses, shrubs, and forbs that are palatable to livestock. Intensive timber management practices such as thinning, pruning, and site preparation can be modified in scope, timing, and intensity to increase the amount, and to extend the period of forage production . . .* (USDA, FS 1980)

The National Cattlemen's Association and other public ranching organizations recently co-signed a National Forest Products Association letter to Forest Service Chief F. Dale Robertson demanding that the Allowable Sale Quantity in forest plans be *mandated*.

Forest thinning allows increased use by livestock. Apache-Sitgreaves National Forest, east-central Arizona.

Many "wildlife enhancement" projects on public forests entail tree thinning or clearing, usually, it is said, to benefit elk or deer. Roads, water developments, and fences are installed, and, curiously, livestock numbers are raised. Though an area may then be thrashed by cattle, the presence of a few more elk or deer will prompt range managers and ranchers to trumpet the "success" of the "wildlife" project.

Equally deceptive are many of the "firewood cutting" programs on public lands. Often, when stockmen want a grazing area thinned or cleared of trees not of sufficient size or quality for commercial logging, they pressure the agencies to open it -- often with new roads -- to commercial or personal-use firewood cutting. As expressed in a federal brush management manual, "The potential for harvesting cordwood should not be overlooked as an added incentive in the management of mesquite, juniper, oaks, and other appropriate species." Having woodcutters saw trees down and haul them away is profoundly easy for the ranching establishment. The cutters get the wood, the government the credit, the ranchers the profit, and the land and the public the shaft. The new roads become ranching roads; fencing, grass seeding, and stock water projects are begun; and small trees are killed from that point on. Presto! -- overgrazed woodland becomes overgrazed ranchland.

Another scam cooked up by Western ranchers in collaboration with self-serving water resource departments and their powerful constituents involves pushing government agencies to eradicate trees and brush to "improve watersheds." Watersheds stripped of their trees and brush, they say, shed water like a tin roof, shooting the increased runoff quickly down through drainages to fill reservoirs, where it may then be used by cities and agriculture. After the land is denuded, it is seeded with livestock grasses, and from that point on cut, burned, or sprayed to keep it free of woody vegetation. The vested interests may then claim that the increased grass cover infiltrates and releases more water into waterways than the original vegetation -- disregarding, of course, the impact of increased overgrazing.

Studies show that these projects generally don't produce much, if any, more water for reservoirs because devegetation, attendant soil damage, and overgrazing deplete prolonged surface flow. They also show that the money, materials, and effort expended, coupled with the environmental damage, don't begin to justify the extra water, and that woody vegetation must be re-eradicated indefinitely. However, they usually do produce more livestock forage, and often this is a main reason our taxes keep being squandered.

For example, in Arizona thousands of acres of upland forest and brush have been cut, herbicided, and burned in an attempt to increase forage for livestock and water to the Phoenix metropolitan area. The Tonto National Forest's effort to keep Pinal Mountain grassy spawned one of the biggest conservation battles in Arizona history, as well as a book entitled **Sue the Bastards**. In another Arizona fiasco, the government spent millions of dollars on the Beaver Creek Project in Coconino National Forest to cut ponderosa pines, junipers, oaks, and brush from hundreds of acres to produce, according to a newspaper editorial, "about enough water to wet a dishcloth," and some additional forage. Yet, an association of government agencies is currently studying the prospects for vastly expanded devegetation in central Arizona forest and chaparral.

Another form of this ripoff involves eradicating trees and brush along waterways because they "drink up and transpire huge quantities of water." This has led to all sorts of crazy schemes, like a recent proposal by Arizona state officials to kill all cottonwoods along several rivers. This was done in the early 1970s by the New Mexico Soil and Conservation Service along a portion of the Mimbres River in southwest New Mexico. As related by Sharman Apt Russel in **Songs of the Fluteplayer**,

> *They believed eliminating these great trees, some more than a hundred years old, would mean more forage for cattle. . . . Without the cottonwoods to hold the soil with their roots and break the impact of water, subsequent small floods swept over the denuded ground like an efficient mowing machine. When the channel was dry again, the eroded result could only charitably be called a river.*

While it is a known fact that plants transpire water, any high school ecology student also knows that riparian vegetation also conserves water, as well as physically protecting waterways and providing many other benefits. However, less trees and brush means more forage, which means more livestock grazing.

Logging, forest health management, wildlife enhancement, wood cutting, or watershed or waterway improvement -- whatever the intentions -- stockmen are the long-term beneficiaries. Though they aid and abet whenever possible and are even in many cases the main motivating influence, they keep a low profile. Why incur public resentment for destroying trees when the government and other land users are doing it for them?

In quantity, leaves of some tree species can be poisonous to livestock, and they may be removed for that reason. Pine needles are blamed for Western livestock losses totaling millions of dollars. A recent article in the *Lassen County* [CA] *Times* is entitled "Pine Needles Threat to Pregnant Cows"; much of Lassen County and the West is covered with pines. While some ranchers are calling for action on this "problem," most are thus far reluctant to call for widespread "pine eradication" programs for this reason.

> *A killer* [ungrazable plant] *is invading Montana! Like a cancer it is spreading at runaway speed, getting out of control, and destroying its victims* [ranchers].
>
> --from an article in **The Stockmen's Journal**

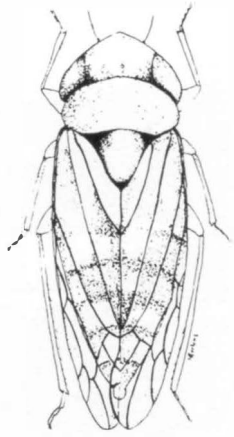
Weeds, according to Emerson, are "plants whose virtues have not yet been discovered." But according to M.E. Ensminger in **The Stockman's Handbook**, "A weed may be defined as a plant (1) growing where it is not wanted and interfering with desired land use, or (2) with a negative economic value within the framework of current land use." According to ranching reality, then, a weed is any leafy, non-woody plant that detracts from livestock operations. Plants now called weeds were components of almost every pristine vegetation community in the West. Even on the "pure" grassland of the prairies, many non-grass species flourished among the grasses, in separate stands, and where fire, animal activity, rocks, drainages, etc. interrupted the grass cover.

"Larkspur -- a rangeland weed," according to the Forest Service. *(USFS)*

Forest Service employee poisoning larkspur via backpack sprayer. *(USFS)*

Approximately 455 acres of wet meadows will be sprayed in the Apache National Forest [Arizona] *in June to control the wild iris . . . . The control project is part of the range improvement program on the Burro Creek Range Allotment.*
--Arizona Daily Star, Tucson, AZ

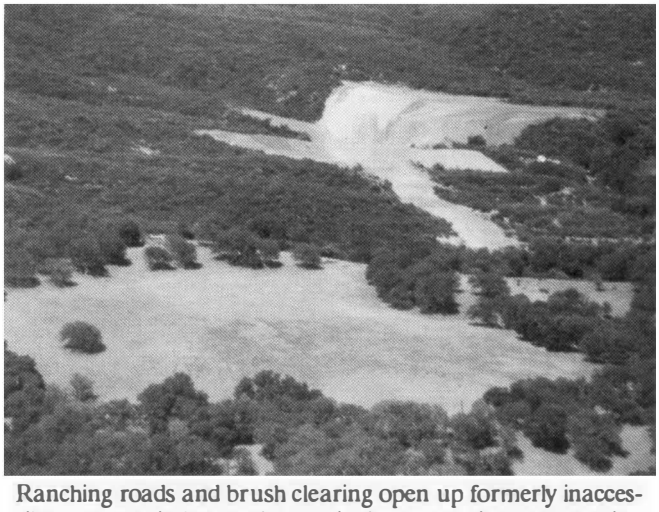
Stockmen disdain "weeds" for many reasons. A great many, such as tumbleweed, mustard, thistle, cheatgrass, and yarrow, are of low palatability; as increasers or invaders, they have replaced forage plants over large areas. Some -- coneflower, ragweed, and paintbrush, for example -- are marginally grazable. Soil cryptogams are considered weeds because they allegedly prevent the establishment of forage. Locoweed, Johnson grass, milkweed, tansy mustard, goldenrod, threadleaf groundsel, larkspur, lupine, wild parsnip, and many other plants can be poisonous to cattle and sheep. (The government occasionally fences off poisonous plants from livestock, rather than eradicating them.) Others, such as cheatgrass, foxtail, and various sticker-producing plants, may physically harm livestock. Some plants are destroyed because they are highly flammable. Some "drink up too much water." Some benefit insects and other wild animals not acceptable to the grazing industry. They damage or block stock watering developments. They hamper ranching activities. They're rank, coarse, unruly, stickery, stinky, strange: almost any excuse will do when an increase in preferred forage is the ultimate goal.



A leafhopper.

Interestingly, most of these plants are natives and, if not for stockmen, would not now be considered "weeds." Those that have increased their numbers and range have done so under the influence of livestock grazing. As related by range professional D. Griffiths in 1910, "The perennials, or more valuable species, have, it is true, disappeared; but they were not driven out by annuals, but on the contrary, by the rancher's cattle" (Griffiths 1910). Many other weeds are exotics that overgrazing has spread over huge areas.

Brush is the mortal enemy of the range manager . . . .
--Boysie E. Day, Professor of Plant Physiology, University of California, Berkeley (USDA, USDI, CEQ 1979)



Ranching roads and brush clearing open up formerly inaccessible, unexploitable, and unspoiled areas to livestock grazing and other harmful developments.

Healthy stands of brush provide for many and various animals, ecodiversity, productive watersheds, recreational use, and aesthetic enjoyment. Be that as it may, brush is the plant type most persecuted by the ranching establishment. Not only does brush reduce forage more than any other vegetation type, but it is the hardest to eradicate. Brush may "hide predatory animals," obscure views of livestock, or physically injure livestock with long spines or sharp, broken branches. Some species have poisonous leaves. Brush hinders the movement of livestock and cowboys.

Chaparral near Sequoia National Park, California, has been stripped from these ridges to increase cattle forage.

Some brush species provide livestock browse, but ranchers much prefer the potentially greater amount of herbage provided by grass. They see brushland as potential grassland. To them, every bush eliminated is that much grass gained. To this end they even kill individual brush plants. With brush eradication projects, some involving hundreds or thousands of acres, they have destroyed millions of acres of aboriginal brush.

Over vast areas, livestock have *reduced* the cover of shrubs and brush along with herbaceous ground cover. Ungrazed roadside on right.

Again, stockmen claim that brush has "invaded" and ruined their once-productive, grass-covered ranges. Again, partly true. However, in many areas overgrazing has actually killed off the original woody cover. This is especially true of arid regions, sensitive transition zone brushlands, low-elevation broadleaf woodlands, and riparian areas.

Ranching advocates similarly argue that brush never occurred as climax communities, that bushes and shrubs are merely "disturbance species" that occupy disturbed lands until grass once again covers the land. This may be true for some species in some areas, but much evidence suggests that *most* Western brushlands and shrublands have been around in one form or another for millennia (see Malin 1956, Thwaites 1959, etc.).

For example, though today big sagebrush covers fully 100 million acres -- more than 1/8 of the American West -- research indicates that it has increased its range only slightly, and that the significant change has been the increase in sagebrush *density* at the expense of other vegetation (Vale 1980). Regardless, more than 12% of sagebrush territory has been cleared of sage for livestock (though usually it eventually regrows under continued livestock grazing and lack of fire) (Ferguson 1983).

Indeed, many brush eradication projects occur in places that never were primarily grass. Often it is assumed that any place with the apparent potential to grow grass originally was grassland, or, if not, at least *should* be grassland. And, with a few magic words from some industry "range expert," a brush eradication project is under way.

> *Through subsidization, brush clearance has grown to become an agricultural industry. It is a significant source of income for various seed, chemical, and machinery interests.*
>
> --Ian McMillan, **Man and the California Condor** (McMillan 1968)

> *The large acreage involved in shrub eradication projects is a telling commentary on the economic power and political influence of the range livestock industry in the intermountain West.*
>
> --Thomas R. Vale, "The Sagebrush Landscape" (Vale 1980)

According to the ranching reality-makers, half or more of the area of former Western grassland has been "invaded" by shrubs, brush, trees, and weeds. According to USDA, "noxious" plants have "taken over" tens of millions of overgrazed acres and cost ranchers roughly $107 million annually in livestock deaths, birth defects, abortions, or emaciation. But calling it an "invasion" is a tremendous distortion. By growing a covering of woody plants or other vegetation unpalatable to livestock, in a sense the land protects itself from further overgrazing.

Stockmen's answer is to kill the offending plants, instigate range developments, and *increase* livestock numbers, leading to more unwanted vegetation, more eradication, more

developments; in short, endlessly staving off livestock impacts and maintaining livestock numbers with more and more range management. Stockmen do not tolerate livestock reductions. Instead, the land itself must be changed, or grazing systems, or agency management, or even people's perception of the problem.

To maximize livestock production, ranchers and range managers seek to maximize vegetation that benefits livestock by minimizing that which doesn't. This is euphemistically called "type conversion" -- changing the vegetation from one type to another. In truth, stockmen find reason to kill nearly every kind of plant but preferred grass. Since so little preferred grass remains, vegetation manipulations are usually designed to erase *all* vegetation in a given area, in hopes that new growth will contain more grass. In so doing, the industry gives itself a "clean slate" on which to create a livestock-oriented landscape.

Since the early 1900s most biotic manipulation on public grazing allotments has been done by the various governments, bolstered in 1974 by the Federal Noxious Weed Act. Today, under a variety of rationales and pretenses, nearly every public land management unit in the West conducts vegetation eradication. Many means have been developed over the years. They are used singly or in various combinations now under the buzz phrase "integrated pest management." Described below are the 6 basic methods.

Mechanical Methods

Numerous and sundry mechanical means are employed to physically destroy plant enemies. Prominent among these is "chaining," in which a heavy chain (or a heavy cable) is dragged between 2 crawler-type tractors to rip out all woody plants. The heavy equipment and huge anchor chain kill wild animals, destroy nests and burrows, kill many non-woody plants, damage the soil, drag and dislocate large rocks, and generally trash the land. In **This Land Is Your Land**, Bernard Shanks reports that chaining has likewise effaced hundreds of federally "protected" Native American ruins and archaeological sites (Shanks 1984). After chaining, the woody debris is burned or left to rot.

In an average year hundreds of square miles of Western public land are chained, hundreds or even thousands of acres at a time. Utah State University research scientist Ronald Lanner a decade ago found that more than 3 million acres (the size of Connecticut) of public pinyon/juniper land had been chained for cow pasture (Shanks 1984). Lanner recently stated that the weight of published research does not support any of the reasons used to condone chaining. Yet, common to the remote West is the chained landscape -- thousands of broken juniper, pinyon, greasewood, or sage skeletons scattered about the ravaged land, a few cows seeking forage among them.

A harrow is an agricultural implement consisting of a row or rows of metal teeth, spikes, or upright discs protruding downward from a supporting frame. Harrows are dragged across public land behind tractors to kill shrubs, brush, and other "unacceptable" vegetation. Similarly, railroad rails, channel irons, "H"-beams, and other heavy implements are pulled across the ground to break off and kill brittle shrubs in what is generally termed "railing." Environmental damage is similar to chaining.

Public land is even plowed and disced as if it was private farmland. With these techniques, soil is penetrated and displaced to the depth of a foot or more to kill offending vegetation -- sagebrush, creosote, and "weedy" plants in particular. These methods not only destroy *all* plants but damage topsoil, increase soil erosion, and destroy animals, soil dwellers especially, and their habitat.

> *Towed units chop as well as crush for better brush and slash treatment. On steeper slopes these units should be towed up and down the slopes to prevent erosion and avoid sideslip. Rolling choppers should move at high speeds for maximum effect. Production rates vary from two to nine acres per hour.*
> --From *Range Seeding and Brush Management* by Gilbert L. Jordan

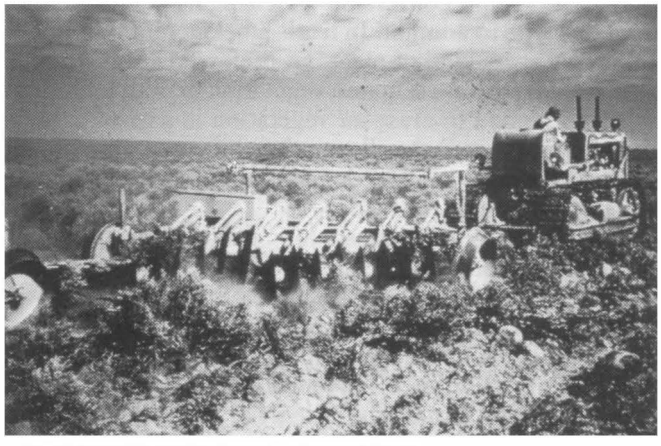
Other machines and implements are driven or pulled across public land, raking, mowing, cutting, crushing, chopping, beating, shredding, and otherwise destroying "undesirable" vegetation. Sometimes vegetation is simply scraped off the land with bladed bulldozers. "Root plowing"

Chaining trees and brush in an attempt to increase cattle forage. *(SCS,USDA)*

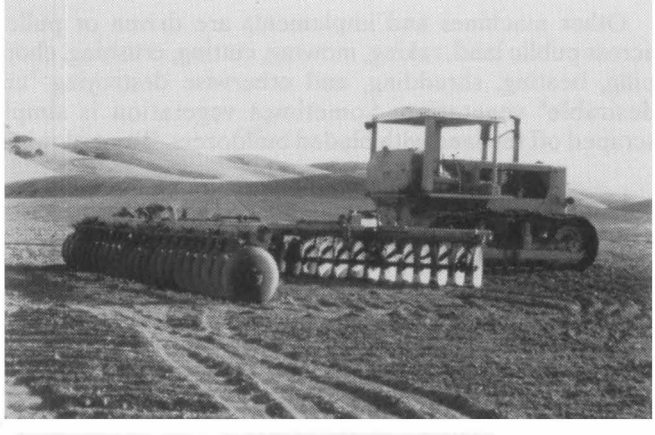
by large tractors destroys brush roots to a depth of a foot or more. Some machines "grub" individual bushes or trees, cutting, ripping, and yanking roots, pushing or pulling plants out of the ground. Grubbing and "weed" killing are also accomplished by hand, with axes, mattocks, spades, and hoes.

The 72-ton machine ("tree crusher") uproots, crushes, and splinters juniper trees in one operation. Because most trees are pushed out of the ground before being crushed, the percent kill is high (about 80%). On fairly level terrain, this machine can crush about 4 ha [10 acres] *per hour.*
--from **Range Management** (Holechek 1989)

A BLM rotor-beater brush removal in Elmore County, Idaho. *(BLM)*



A BLM sage disking operation. *(BLM)*



Discing the range in the central California hills.

BLM land in Hamlin Valley, Beaver County, Utah.

A crawler tractor piling brush. *(SCS, USDA)*

Chainsaws are a favorite tool for increasing livestock production. BLM, McKinley County, New Mexico.

Large stands of trees and brush often are felled with chainsaws. Smaller stands may be cut with hand saws, axes, machetes, and brush hooks. Another method of "control" is "girdling" -- cutting off a strip of bark around the circumference of the trunk of a tree or large bush, which will kill it. Trees, brush, and weeds alike -- ranchers and range managers eradicate the unwelcome plants by just plain hacking away with axes, mattocks, hoes, spades, bushwhackers, weed whackers, hatchets, pruners, pocket knives, and potato peelers.

After vegetation is uprooted, cut, or by whatever manner taken to pieces, it may be pushed or raked into rows (windrowed) or piles and burned to prepare the land for intensified livestock grazing. Roads, fences, tanks, and other "improvements" may then be installed and management further intensified.

In Texas, where the golden-cheeked warbler depends upon mature Ashe juniper for nesting, removal of junipers as a range-improvement measure caused such a serious reduction in numbers that it was declared a threatened species by the U.S. Fish and Wildlife Service.

--Denzel and Nancy Ferguson, **Sacred Cows** (Ferguson 1983)

Chemical Methods

Without chemicals, life itself would be impossible.

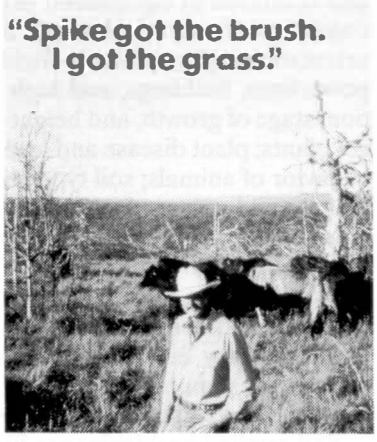
--A motto of Monsanto chemical company

Aerial application of herbicides affords the possibility of chemically treating half of the United States acreage at one time or another.

--Maureen K. Hinkle, Environmental Defense Fund (USDA, USDI, CEQ 1979)

Herbicide application is a comparatively easy way for ranchers to destroy large areas of less-profitable vegetation (especially since the government usually does the work and the taxpayer foots the bill). Unlike mechanical methods, herbicides can quickly denude thousands of acres at a time.

This explains the strong push by the ranching establishment to increase herbicide use on public lands. With almost religious fervor, many recommend its application for virtually every vegetation eradication proposal. Behind it all are the huge national and multi-national chemical companies with their multi-million dollar promotion campaigns. With convincing presentations, they offer a variety of herbicides as the answer to a host of range problems created or perceived by the grazing industry.



An ad for range herbicide. Look closely. *(Julia Fonseca)*

Major herbicides used on public ranges today include 2,4-D, Picloram, Dicamba, Atrazine, Dalapon, Tebuthiuron, Glyphosate, and Hexazinone. Of these, 2,4-D accounts for a large percentage of acreage "treated." Range managers sometimes test combinations of these.

The commonly used rangeland herbicides 2,4,5-T (a defoliant used in the Vietnam War) and Silvex were finally banned by the Environmental Protection Agency (EPA) in the early 1980s when they were found to be carcinogenic. They contain dioxin, a deadly poison shown to have adverse effects on wild and experimental animals. Dr. Diane Courtney, head of the Toxic Effects Branch of EPA's National Environmental Research Center, states that dioxin is "by far the most toxic chemical known to mankind," while Dow Chemical states that "2,4,5-T is about as toxic as aspirin." Near where 2,4,5-T was sprayed in Oregon National Forests, pregnant women experienced increased miscarriages, and birth defects, prompting rural rebellions with angry locals shooting at spray helicopters. Silvex and 2,4,5-T were outlawed under public pressure, and despite years of irrational defense by the chemical, timber, and ranching industries.

A Forest Service helicopter spraying herbicide on vegetation noxious to livestock. Beaverhead National Forest, MT. *(USFS)*

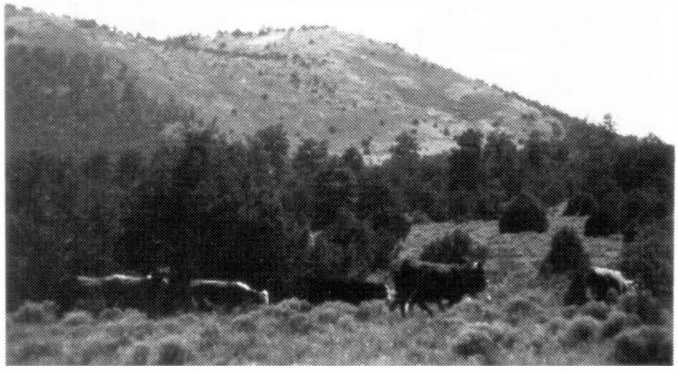
By far most range herbicide is applied in spray solution from small aircraft and helicopters equipped with sprayers. It may also be applied with boom-type broadcast sprayers mounted on trucks or pulled behind tractors, or with hand sprayers. The poison lands on foliage, enters through the leaf surface, and is translocated to the root system, where it kills the plant. Some herbicide comes in dry "bullets" or pellets, which may be applied aerially or by hand from vehicles, horseback, or on foot. These "soil applied" herbicides enter the soil in solution with precipitation and directly kill plants when absorbed by the roots. Trees and bushes may be killed individually with subsoil and trunk herbicide injectors.

There are 70 million acres of mesquite, 76 million acres of juniper, 96 million acres of sagebrush, over 40 million acres in scrub oaks, and 78 million acres of cacti which are significant contributors to unproductive rangeland. The benefits of herbicides are virtually self-regulating.... Our ecosystem is under dynamic change, whether managed by man or nature. It is important that we manage it in the proper direction.

--C.S. Williams, Business Manager, Dow Chemical Company, at a rangeland symposium (USDA, USDI, CEQ 1979)

Herbicide is used to kill sagebrush, snakeweed, mesquite, acacia, shadscale, greasewood, creosote, scrub oak, manzanita, rabbitbrush, other brush and shrubs, juniper, pinyon, tamarisk, cacti, yucca, and a great variety of "weedy" plants and livestock-unpalatable grasses. Herbicide also is used to kill regrowth following use of other methods of vegetation eradication.

The wide-spectrum herbicides commonly used on the Western range poison most or all plants in a given area. Eliminating vegetation has, of course, serious environmental consequences, too numerous to detail here. Animals that rely on these plants, especially smaller or sedentary animals unable to move to unpoisoned areas, suffer and die. Those that can relocate infringe upon existing residents. If vegetation is not soon replaced, soil erosion increases greatly. Cryptogamic plant communities are simultaneously destroyed, along with the stability and protection cryptogamic crusts provide the soil's surface and soil below. Consequently, water infiltration and retention may be reduced. After natural vegetation is removed, usually a more uniform cover of only a few plant species (often exotics) grows back or is seeded or planted, setting up conditions conducive to explosions of pest animals. Because of this, herbicide use is one of the main reasons for the dramatic rise in pesticide use in recent years.



A National Forest mountainside (background) divested of trees and brush by herbicide provides increased cattle forage.

Cattle seek herbage amongst herbicided juniper skeletons on west-central New Mexico BLM range.

One cannot help but question the wisdom of registering, selling and spraying an herbicide [picloram] *known to persist in the environment, volatilize, leach into groundwater, damage non-target plants, contain carcinogenic contaminants, lack any acceptable chronic effects testing, affect humans adversely and display synergism and carcinogenicity.*

--Mary O'Brien, National Coalition for Alternatives to Pesticides

Notwithstanding downplay by chemical companies and other vested interests, herbicides *are* dangerous poisons. Workers handling these chemicals have experienced numerous ailments. Though advertised as being non-toxic, or as losing their toxic qualities within hours or days after use, many herbicides have been shown to retain toxic qualities for weeks or months, or in some cases years. Research has proved that some accumulate in the tissues of plants and animals and in mothers' milk. Other studies show that these chemicals break down under natural conditions to form compounds sometimes more toxic than the herbicides themselves. Picloram is assumed to be carcinogenic even by the BLM, as is glyphosate by the EPA; nearly all the others are considered possible or probable carcinogens, even by the agencies. And, EPA regards some herbicides to have high leaching potential, making them hazardous to groundwater supplies.

Herbicide may enter animals' bodies by absorption through skin, lungs or breathing tubes, or in food and water. Small contaminated animals are eaten by larger ones, which are eaten by larger ones, and so on; depending on a host of variables, this chain of events may or may not increase concentrations of harmful chemicals faster than they break down into less harmful substances. Such an increase is called bioaccumulation. Although a waiting period of 2-3 months is recommended before grazing livestock, this is often not followed. Livestock themselves occasionally are sprayed, accidentally or because the rancher did not expend the effort to move them.

There are so many variables in the foliar application of herbicide that it is virtually impossible to guarantee environmental protection -- to predict for sure where the chemical will go or what it will do. These variables include wind speed; temperature; humidity; sunlight; precipitation; skill and attitude of the operator; marking of target area; type and condition of equipment; preparation of herbicide and condition of materials used; nozzle size, pressure, and orientation; spray pattern; flight height; obstacles such as powerlines, buildings, and high rocks; topography; condition, stage of growth, and height of both target and non-target plants; plant disease and insect damage; the species and behavior of animals; soil type and amount of soil moisture; amount and nature of any water which may be present; and management before and after "treatment." Many things can and often do go wrong. If the spray height is too high or nozzle holes too small, some of the herbicide mixture may volatilize and drift somewhere else. If the wind picks up, herbicide may end up on cattle or in other vegetation, streams, or someone's garden. If heavy rain falls soon after spraying, herbicide may be carried into waterways.

Soil-applied herbicides are likewise risky. In addition to many of the problems above, herbicide pellets or granules

may be accidentally mixed with human food stores or water supplies, swallowed by wild or domestic animals, or dropped in non-target areas. Additionally, herbicide in pellet or granular form generally persists in a toxic state much longer than it does in spray form.

Another chemical method of killing unwanted plants involves pouring oil, diesel fuel, kerosene, and other poisons around the bases of offending plants. Ranchers also sometimes dump these substances on the stumps of bushes and trees after being cut. Much of this activity occurs without agency knowledge or consent.

Since the early 1980s, rangeland herbicide use has declined. As mentioned, EPA outlawed the formerly popular, more effective 2,4,5-T and Silvex, and public concern over the effects of herbicide use has risen dramatically. Even costs have become somewhat prohibitive, especially in drier, less productive, and degraded areas where there is so little potential forage that the cost-benefit ratio is glaringly disparate.

Despite the recent downturn, however, there is reason to fear herbicide will regain prevalence as public upheaval subsides. For example, BLM's recent Draft Vegetation Treatment EIS proposes to increase herbicide spraying in the West from the current average of 37,475 acres per year to 141,515 acres per year; 90% of this would be on rangeland. Ranching pressure remains strong, and the current Congress and Bush administration, like all others, contain many ranching advocates.

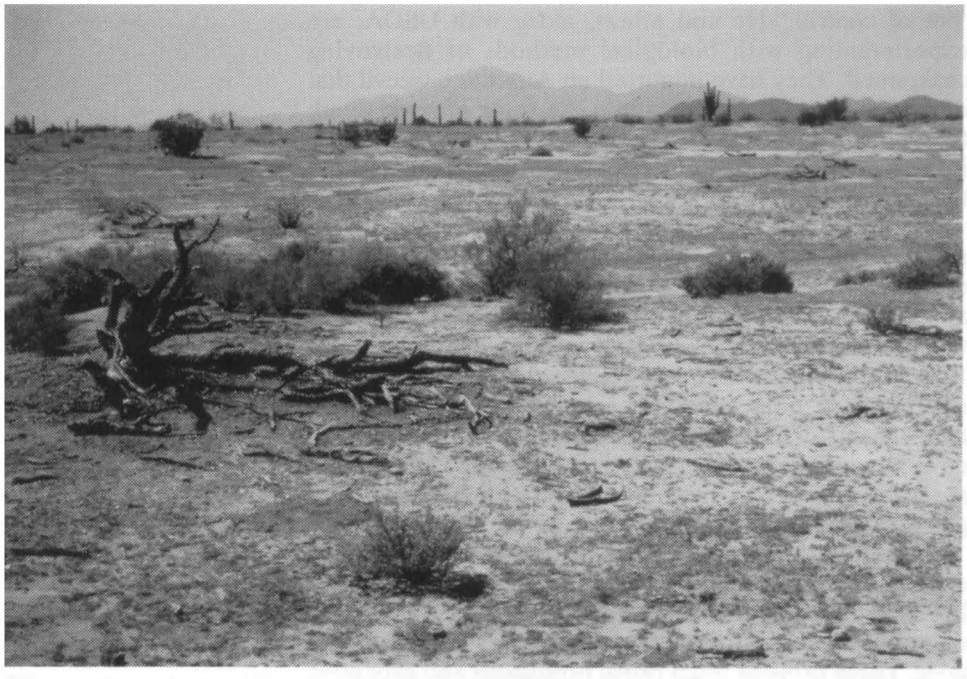
> *It is so popular in these days of environmental awareness to be opposed to herbicides and other pesticides as pollutants, that it takes courage to advocate their use, particularly on forests, ranges, and watersheds where livestock, wildlife, and streams are exposed . . . .*
>
> --Boysie E. Day, Professor of Plant Physiology, University of California, Berkeley (USDA, USDI, CEQ 1979)

In conclusion, herbicide use *may* increase forage production. But this increase can only be temporary so long as livestock use remains heavy; and, it occurs at the expense of the natural environment. Continued ranching inevitably leads to the same recurrent problems, and to more use of herbicide as a "quick fix." For example, one study of herbiciding on sagebrush rangeland showed increased livestock profits of 24% after preliminary application, but that re-application was expected to be necessary on an average of every 12 years (Holechek 1989). Indeed, it is commonly acknowledged that under continued livestock pressure the effective "treatment" life of herbicide is only 10-20 years, at which time herbicide must be reapplied. In this way, rangeland herbicide use is like narcotics addiction.

The ranching establishment has "treated" *many thousands of square miles* of public land with herbicide to kill both native and ranching-attributable "unwanted" vegetation. Environmental damage has been extensive, the results transitory, and the cost enormous. Once again, the treatment obscures the illness, or becomes part of the illness.

> *Treatment of the land and air and water with phenoxy herbicides is not the answer. They are part of the short-sighted cosmetic solutions supplied by the chemical industry and the government such as have long plagued the management of our public lands.*
>
> --Donna M. Waters & John C. Stauber, Coordinators, Citizens National Forest Coalition, Inc.

Junipers killed by herbicide.



This central Arizona state range was once a land rich with life. Now, decades after being herbicided for cattle production, there are miles of overgrazed, barren waste.

Biological Methods

Infrequently, biological "controls" utilizing fauna and flora are used to manipulate vegetation on public ranges. Most notable has been the use of insects to eliminate "noxious" plants.

Plants introduced without their natural parasites often show dramatic initial reductions when these parasites are introduced. For example, early in this century the livestock-poisonous Klamath weed "invaded" overgrazed ranges in the Pacific Coast states and monopolized more than 250,000 acres near the Klamath River. "Control" efforts long seemed futile. Finally, a leaf-eating beetle (previously introduced into Australia from France) that feeds only on Klamath weed was introduced into these areas. The beetle proved effective -- *except*, curiously, along fenced, ungrazed roadways, where Klamath weed survived as part of a much more diverse and flourishing plant community. Here it waits today, ready to reinvade adjacent overgrazed ranges when the opportunity arises.

In New Mexico overgrazing has caused broom snakeweed (a native opportunist) to partially replace grass and other more "desirable" plants on an estimated 40 million public and private acres, including 60% of state-owned range. On 4 million acres it has choked out most other vegetation. Snakeweed in quantity is poisonous to livestock, causing sickness and aborted fetuses. It competes with forage plants, compounding depletion from overgrazing. Needless to say -- though they are most responsible for spreading the plant -- stockmen hate snakeweed. Therefore, the government hates snakeweed, and the public is supposed to hate snakeweed. Government and ranchers spend about $2 million annually just to fight snakeweed with chemicals.

According to New Mexico State University researcher David Richman, broom snakeweed in New Mexico has gone "out of control." He and others, along with USDA, are experimenting with biological methods of destroying snakeweed. They have imported an Argentine weevil that during its larval stage bores into the roots of snakeweed, then eats the plants. If proven feasible, the snakeweed-killing weevil may eventually be released on rangelands around the West.

But there always are complications when trying to manipulate the environment. Will the weevil itself get "out of control" and kill too much snakeweed? Snakeweed was an original and essential component of many Western vegetative communities, making up an average of about 10% of vegetation in its range. Shouldn't it be allowed its rightful place in the environment? Will the weevil kill non-target plants or cause some other unforeseen harm to the environment? Moreover, if livestock are the cause of the snakeweed "invasion," why aren't livestock removed from public lands instead of snakeweed?

Research on biological "control" is mostly a matter of experimenting to determine which organism most effectively kills an unwanted plant, what method of utilizing that organism is most efficient, and what complications might arise. These projects often prove prodigious and expensive -- especially when there really is no practical biological "control" to be discovered! They likewise may be environmentally hazardous. For example, some insects introduced to kill "noxious" range plants kill other plants as well, upset natural processes, and pose threats to agricultural crops and ornamental vegetation. Close relatives of some plants targeted for biological extermination are on the Threatened or Endangered Species list and could be further reduced or extirpated. Research on imported parasitic plant fungi poses such a threat to the biosphere that it is carried out only in a custom-built, escape-proof greenhouse at an old Army biological warfare center at Fort Detrick, Maryland.

"Successes" in biological eradication of unwanted range vegetation are few and far between, but grants for research are numerous. In Montana, a fungus, a fly, and a few other insects are being considered to combat knapweed, which covers 4.5 million overgrazed acres of the 90-million-acre state. The situation is similar in Utah regarding the "invaders" squarrose knapweed and Russian knapweed; Utah State University researchers are also testing a naturally occurring parasitic rust on dyers woad, a kind of mustard that has spread across more than 150,000 overgrazed acres. In California, government researchers are testing, thus far with little success, weevils, flies, and fungi on yellow star thistle, a wickedly spiny exotic that has colonized more than 8 million acres in the overgrazed Golden State alone. In some states various insects have been suggested for killing leafy spurge. Worldwide, according to the Forest Service, only "57 attempts to partially or completely control plants biologically have been successful . . ."

Generally, the ranching community finds biological means too abstract and ineffective. Activity in this field is centered at agricultural colleges and agency research centers, where funding provides the impetus for research. And, though much hoopla is made over the fantastic potential for the biologic breakthroughs that will magically erase rangeland degradation, there is little reason to believe that this is much more than public relations hype.

Livestock Methods

A range ecologist for Rocky Mountain Forest and Range Experiment Station [FS], *Duane Knipe was looking for an alternative to prescribed burning, herbicide treatment, or mechanical means such as root plowing or chain-dragging for shrub control. Goats seemed to fit the formula: browsers that were cheap and* environmentally acceptable [emphasis added].

--Jan Barstad, "A New Look," *Arizona Highways* (March 1987)

Incongruous as it may seem, livestock themselves are sometimes used to help rid the range of "unwanted" vegetation. By manipulating the timing, frequency, intensity, and kind of livestock use, ranchers manipulate vegetation characteristics. Further, studies are underway to determine the effect of chemical and mineral supplements on forage and browse preference so livestock may be "induced" to eat selected plants. Ranching zealot Thadis W. Box reports that other studies are in progress to see if young livestock may be psychologically "conditioned to eat the plants we want them to eat (Box 1987)."

In a broad sense, *all* livestock grazing is a form of vegetation manipulation -- of favoring some plant species over others. Yet historically this was rarely a conscious attempt. With the recent downturn in herbicide use and mounting public opposition to traditional methods of destroying vegetation, livestock are increasingly used as an "environmentally acceptable" "management tool" ("tools that moo" is a current catch-phrase) specifically to eradicate certain species or types of plants. Flowery industry rhetoric portrays this as a great advance in "progressive, scientific range management." In practice, what it amounts to is that livestock are heavily concentrated on a target area for a certain period in hopes that they will eat and/or trample the unwanted plants into oblivion. This is commonly called "intensive herding."

For example, the "undesirable" plant leafy spurge has "invaded" roughly 3 million acres since it was first sighted in the US in 1827. In Montana, where longstanding cattle grazing has caused leafy spurge to spread over about 500,000 acres of public range, some ranchers are using dense herds of cattle to help eliminate it. Leafy spurge is sensitive to physical injury from intensive trampling; stems are broken and seedlings killed. In theory, when a tightly packed herd of cattle is placed in an "infested" area, the concentrated cows perforce step on and kill most of the spurge plants. In some areas intensive herding has had this intended effect; in others it has not. In either case, it may create or worsen other problems. Sheep and goats like to eat leafy spurge, so herds of these animals are being used to reduce the plant in some areas.

On some National Forests, goats are used to destroy brush to increase cattle forage. Concentrated herds of hundreds of goats are driven into brushy areas where essentially they eat every plant in sight, including all leaves and twigs from bushes. Often in combination with other methods of vegetation manipulation and grass seeding, depending on a host of uncontrollable variables, the goats may or may not have the intended effect of killing off the brush and allowing replacement by forage plants. Where they have, "success" has been highly publicized by ranching advocates. Where they haven't, the land often ends up even more degraded than before, and the ranchers and rangers keep it quietly under their cowboy hats.

In Colorado, ranchers have publicized great "success" using goats to destroy Gambel oak sprouts, increasing livestock forage in the process. On northeastern Arizona's Tonto National Forest in 1980, Dr. Duane Knipe of the Rocky Mountain Forest and Range Experiment Station launched a goat study. A herd of 240 angora goats was brought in to eradicate brush. "They ate everything, even the grass we planted after we burned the hill," said Knipe. (According to Dan Dagget, head of the mountain lion protection group Lions Unlimited, "Our source tells us that as many as 15 lions have been killed in the vicinity of that goat cell." This aspect of the study was never publicized.) After 2 seasons the goats were removed and the study was terminated due to extreme overgrazing. The goats were then moved to a ranch near Kingman in northwest Arizona, where 3 years later the rancher publicized his "success" decreasing brush and increasing grass with goats. He added reluctantly, "Our progress has been slower than I'd like because we haven't had much rain -- it all depends on rainfall." In checking official climatic records, however, one finds that rainfall in the area during the period was actually *higher* than normal.

They lie.

--Mike Roselle, progressive activist

To eradicate unwelcome plants, some ranchers experiment with intensive sheep herding. Others try combinations of livestock animals. For example, a mixture of cattle, sheep, and goats can be used to eliminate plant cover as thoroughly as herbicide. Intensive herding may also be used to augment other "control" methods or help prepare the soil for grass seeding, as was done recently with pig herds in Arkansas. In southern New Mexico, camels are being tested on "worthless" vegetation because, according to the experimenter, "they can eat things you wouldn't even want to pick up in your hand." Llamas have also been suggested. And rhinoceroses "because what they didn't eat, they'd bulldoze." Apparently all is fair in love, war, and public lands ranching.

Results, success or failure, are largely in the eye of the beholder. Suppose a huge herd of cattle is concentrated on a range covered with diverse native vegetation. The cattle trample and eat heavily until the area resembles a golf course, with mostly a single species of hardy, low-profile grass withstanding the onslaught. The cattle's owner is happy; to him that green stubble monoculture is much preferable to the less livestock-palatable native vegetation. Or, suppose he moves his herd slowly through a field of livestock-inedible wild flowers. The trampling destroys most of the flowering plants and gives the grasses underneath an advantage. Grass prevails for several years, and he feels successful. In our ranching-oriented society, ranchers, range college pros, and government range personnel define environmental quality to conform to ranching goals.

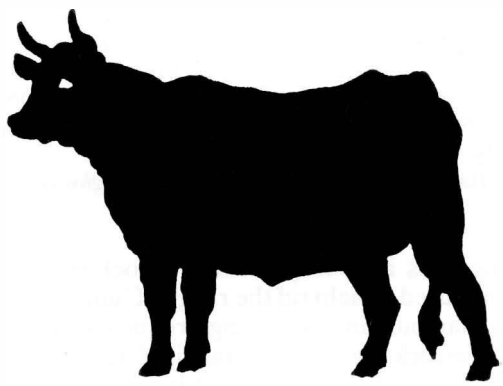
The "successes" are widely publicized, the failures rarely. Even when intensive herding results in forage *decreases*, ranchers are prone to feign success, for theirs is not merely an effort to increase forage but to maintain control of public ranching empires. They use alleged "successes" in using livestock to "improve" the range as an argument to justify their operations or even greater numbers and more intensive management of livestock. More than situational occurrences, this is a widespread, calculated attempt by ranching advocates to convince the public and government that "properly managed" livestock actually promote environmental health, that ranchers should therefore be given even more power over public land.

But it is hard to hide the fact that using livestock to correct livestock-caused problems is an inherently self-defeating proposition. Changes in the kind of livestock and method of management may alleviate some problems, but they invariably create others. Livestock management, particularly intensive herding, entails so many uncontrollable variables that effects on livestock or the environment cannot be predicted with any certainty, especially over years or decades. No amount of scientific knowledge or technological skill can change this.

Admittedly, intensive herding may more than other grazing strategies simulate the herding effect of wild herbivores. Depending on many often ungovernable and variable factors, it may or may not be less environmentally harmful. But again, livestock cannot go far toward imitating Nature.

Despite its increasing popularity, intensive herding will probably never gain widespread acceptance because it has many practical limitations. Endlessly moving herds about to keep them in the most profitable locations while simultaneously protecting the land under constantly changing environmental conditions is essentially impossible. Because herds must be watched closely, packed tightly, and moved often, intensive herding is labor intensive. Most ranchers are unwilling to work that hard or hire extra help. Intensive herding is ineffective against many unwanted species, including plants resistant to heavy cropping or trampling, as well as large bushes or trees. Obviously, it also is useless in areas where toxic or otherwise harmful plants may be encountered. And, except with goats and sometimes sheep, it doesn't work well in rugged country, which makes up a large percentage of the West. Even comments from the most "successful" intensive herders are rife with "Progress has been slower than expected . . .," "If the Forest Service had only let us . . .," "The weather hasn't been cooperating . . .," "If we'd only . . .," "Next year . . .," and so on. Results are rarely impressive. At worst, they are an environmental tragedy.

As with all artificial methods of destroying unwanted vegetation, intensive livestock herding is an extreme shock to any ecosystem. The resulting radical fluctuations in the amount of plant material may prove disastrous to many dependent animals or give rise to pest infestations. A livestock herd's grazing and trampling can lead to extreme soil erosion if a violent storm strikes before vegetation recovers. However, if adequate precipitation doesn't follow, vegetation may not recover at all. The heavy concentration of domestic animals in an area can spread afflictions to wildlife. Or it may raise sediment levels in waterways so high that aquatic animals and plants die. Recurring denudation of vegetation may eventually eliminate certain native plants. Intensive herding, or any other type of livestock grazing, is simply not worth the risk -- especially when the ultimate goal is more livestock on the range.



Fire Management

Fire has always been a part of the natural environment. However, BLM sees fire from two different aspects [sic]*: wildfires that cause negative impacts and must be suppressed and prescribed fires that can be used toward achieving positive resource management objectives.*
--BLM, *Managing the Nations* [sic] *Public Lands* (USDI, BLM 1987)

Fire management is the manipulation of fire to achieve defined goals. As you can probably guess, the main goal on public rangeland is promoting livestock production. This manipulation comes mostly in the forms of "prescribed burning" and "fire suppression" by various government agencies.

Smoke from a prescribed burn on winter range, Kaibab National Forest, northern Arizona.

Prescribed burning is intentional burning under formulated conditions. It is used to achieve many stated objectives, but, stated or not, foremost among these on public rangeland is eliminating competing vegetation to favor livestock forage.

Most grazing allotments contain areas covered with "unproductive" shrubs, brush, trees, "weeds," rough grasses, etc. When ranchers, grazing advisory boards, or agency range staff perceive fire as an effective means of removing this vegetation, they may include these areas as targets for prescribed burning in allotment or land management plans. BLM reports purposefully burning 101,756 acres in 1987, mostly for livestock, while the Forest Service confusingly reports what seems to be at least 420,000 acres of prescribed burning that year, perhaps 100,000 acres primarily to benefit ranching (USDI, BLM 1988, USDA, FS 1988).

To increase forage in forests and brushlands, government employees cut brush, small trees, and lower branches from trees, throw them in piles, and burn them when the weather allows. Another method of prescribed burning is torching individual plants. This is effective in killing certain species of trees and brush. Even flamethrowers are sanctioned weapons, as Theodore Knipe reports in *Javelina in Arizona*:

> *In some localized areas, during the dry periods, ranchers burn the spines off cacti so that cattle may readily feed on them. In this practice the ranchers burn* [with flamethrowers known as "prickly pear burners"] *all the cactus in the treated area and the cattle consume the entire plant.*

According to the ranching text **Range Management**, "Based on recent figures from south Texas, it costs about $0.35 per animal unit per day to maintain animals on prickly pear compared to $0.78 if relief corn is used or $1.09 for alfalfa."

A Forest Service employee igniting a prescribed burn. *(USFS)*

Torching individual plants in the Wenatchee National Forest, Washington. *(USFS)*

Overall, prescribed burning has 2 basic motivations: (1) to correct past (including fire) mismanagement and (2) to alter ecosystems to benefit certain commodity users, most notably loggers, stockmen, and hunters. BLM states, "Prescribed burning is used to enhance wildlife habitat, improve range forage mixtures, improve watersheds, improve the visual backdrop, and remove forest harvest residue." These are among the reasons most frequently given for prescribed burning. Others include: reduce the amount of combustible fuel, help prepare a site for grass seeding, and "open up" the land to access and use. On the Western range, they may all be translated as "improve habitat for livestock" or "mitigate ranching impacts." For example, the Sierra National Forest in central California plans extensive controlled burns over the next 10 years to "improve deer habitat." Coincidentally, it also plans vastly increased livestock grazing in the burned areas.

Prescribed burns vary in size from the area around a bush to many thousands of acres. The largest are usually subdivided and burned as blocks of less than a thousand acres on a continuing, daily basis. Burning may continue for weeks or months, spreading particulates that comprise the persistent, scenery-obscuring haze common to much of the West during "burn seasons."

In prescribing a burn, many factors must be considered, including fuel moisture, type, and distribution; soil moisture; size and shape of the fire area; topography; human developments; prevailing wind direction; and weather. When a burn plan is formulated, the public may be notified, the burn area ribboned or staked out, and fuel-breaks and firebreaks constructed (these too are environmentally destructive). Artificial fire designs vary considerably. For example, a firebreak may be cleared around the entire prospective burn area. When circumstances are deemed right, agency employees with drip torches initiate a long line of fire along the downwind firebreak's upwind side, and the backfire is allowed to burn upwind to the intended destination. Other employees with fire-fighting equipment wait at strategic locations around the perimeter to make sure the fire burns as planned.

Regardless, the fire may not behave as planned. "Controlled" fires commonly do get out of control and damage non-target areas. Many Western conflagrations began as "controlled" burns. Likewise, because prescribed fires are influenced by many uncontrollable variables, environmental protection cannot be assured. For instance, if a hot, dry wind arises suddenly, a controlled forest burn set to kill brush may be quickly whipped into a fierce blaze that kills large trees as well.

Anthropogenic fires do not provide the full benefits of natural fires, and are comparatively destructive in many respects. For example, because of precautions taken to minimize danger to personnel and prevent fires from spreading beyond planned perimeters, many prescribed fires do not burn hot enough to mimic the burn effect of natural fires.

Negative effects of prescribed burning may be briefly summarized as follows:

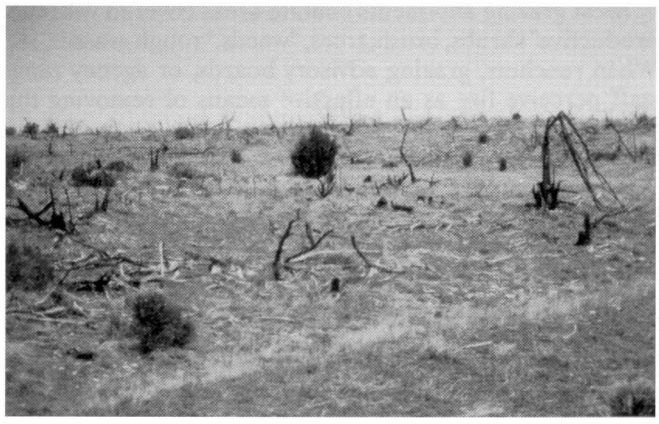
- reduction or elimination of natural fires causing reduction or elimination of native fire-dependent species;
- destruction of brushlands and dependent wildlife;

- in forests, a reduction of foliage height diversity, creating a 2-layered instead of multi-layered forest, with attendant reduction in wildlife diversity;
- in grass/shrublands, diminishment of native species along with target shrubs;
- because organic litter doesn't have time to rebuild and *all* of each target area is burned, there is more frequent and more complete loss of energy stored in ground litter than with natural fires;
- more frequent and more complete elimination of wildlife cover at ground level than with natural fires;
- recurrent, short-term elimination of ground level food supplies needed by wild animals;
- because prescribed fire is managed to burn *all* of a target area *evenly*, thereby creating a relative biotic monoscape, there is increased danger of pest and disease outbreaks;
- and, because prescribed burns provide much less diversity of impact than natural fires, there is a reduction in biome diversity.

> *Walking around this area a year after the fire, I was impressed with the irregularity of the burn. The fire spread through the crowns of the pine trees, killing many of them, but as much as a third of the ground cover was not burned at all. Low spots, fire shadows behind fallen logs, wet places, etc. were passed over by the rapidly advancing flames. These refugia probably insured the survival of all plant species, and within a year seedlings of the original plant species had already begun to reestablish on the burned areas. Unlike prescribed burns, which creep slowly over the ground into the wind, natural fires whip and swirl rapidly with the wind, leaping from ground to shrubs to trees and back again, while leaving irregular burned patches in numerous fire shadows.*
>
> --Steven P. Christman, Ph.D., "Timber Management Is Not Wildlife Management"

Compared to natural fires, prescribed fires generally are too big or small, hot or cool, frequent or infrequent, and so on to be of maximum benefit to ecosystems. For example, burning too frequently can reduce grassland nutrients by locking them up as less useable compounds and converting excessive amounts into heat. Burning too infrequently can result in a grassland being gradually succeeded by flowering plants and shrubs. Prescribed fires are often started during the wrong weather, at the wrong time of day, in the wrong part of the season, etc. For example, most natural fires burn near the end of or following growing seasons, after most animal inhabitants have finished breeding. Prescribed burning often is done preceding or early in growing seasons, when it may hamper breeding, destroy nests, and kill small animals.

Like other range vegetation eradication methods, fire is commonly misjudged or misused. For instance, young junipers and certain brush species cannot survive frequent burnings. Knowing this, range personnel may artificially burn overgrazed ranges (when overgrazing permits) at unnaturally frequent intervals in an attempt to eliminate these plants. "Weeds," too, frequently are burned off overgrazed ranges to favor forage grasses -- ironically, often favoring cheatgrass, tumbleweed, and other invaders more unwanted than the original "weeds."



The aftermath of a prescribed burn of a juniper forest: increased use by cattle assures environmental decline.

Of course, prescribed fire may be better than no fire at all. Lack of fire in an ecosystem adapted to fire leads to many problems, the most serious being an excessive buildup of combustible materials and the consequent potential for highly destructive fires. In many forest and brushland areas where fire has been suppressed for decades it may be necessary to carefully introduce prescribed fire until the excess accumulation of fuel has been gradually reduced to a level where balance is restored and natural fire can once more assume its rightful place.

However, it is a big mistake to think that because an area contains enough flammable material to burn that it is necessarily wise to burn it. Depending on circumstances, prescribed fire may or may not benefit ecosystem health more than lack of fire. But Nature, through millennia of influence, provides the *most* beneficial conditions, placement, and timing for fire. Likewise, fires respond to the influence of environmental variables too numerous, complex, and uncontrollable to be addressed in fire management plans. In the long run, natural fires result in much greater ecosystem diversity and health than could ever be produced by fire management personnel.

For example, most natural grassland fires are caused by lightning in late summer and the fall, after grasses have matured and dried. The darkened soil surface caused by natural grassland fires subsequently prompts earlier and greater warming of the soil in spring, favoring quick regrowth of certain early-season plants beneficial to wildlife and increasing the activity of nitrogen-fixing bacteria important to restoring the burned areas. Prescribed grassland burns, on the other hand, are often done during other seasons, when blackening of the soil is counterproductive, undoubtedly in many subtle ways not understood. Humanized, rather than natural, fire prolongs environmental deterioration and obscures the real problems behind our need to use prescribed burning in the first place -- overgrazing and fire suppression for the timber and ranching industries.

FIRE is a four letter word.

Fire suppression is the effort to minimize natural fire. It comes in the form of (1) minimizing ignition sources, (2) manipulating the land to reduce the likelihood of fire, and (3) fighting wildfires themselves.

Fire suppression in the West began in earnest long ago, when early ranchers and loggers perceived that they could increase profits by "protecting" grass and trees from fire. Not understanding that fire actually helps maintain healthy grasslands and forests, they pressured the government to begin a fire suppression campaign in the early 1900s. Initially, the campaign accomplished what it was designed to do. Fire was reduced greatly in many areas, and ranchers and loggers were largely unimpeded by fire.

But soon their anti-fire effort began to backfire (so to speak). As the years passed, huge amounts of woody fuel accumulated in brushlands and forests. When fires did start, they often turned into raging conflagrations that destroyed all vegetation, including marketable trees. With fire suppression and overgrazing, shrubs, brush, and "weeds" encroached upon many grassy areas, eliminating forage plants.

Nevertheless, ranchers, timber interests, and government waged war against their perceived enemy with ever-more effective technology. The resulting greater accumulations of woody fuel led to increasingly destructive forest and brushland wildfires, which led to more intensive efforts to suppress them, which led to even more explosive fires, and so on. Dwindling amounts of grass were "protected from fire" with ever-greater fervor, which led to even greater encroachment of unwanted vegetation.

Decades of misunderstanding and bad-mouthing by vested interests cast fire into the role of hated villain. With massive ad campaigns featuring the immensely popular Smokey the Bear, the government convinced the public that fire is an inherently destructive enemy and should be fought with everything we can throw at it. Millions of children grew up knowing that "Wildfires are bad!", just as house fires are bad. Behind the cowboy and the policeman, the fireman became perhaps the most revered figure in Americana. Ultimately, fire suppression became its own best reason for being.

Yet, natural processes could not be circumvented indefinitely, and the destructive fire suppression policy probably stemmed as much from misunderstanding as from greed. In recent decades, many land managers have at least come to see the need for removal of excess combustible material to prevent explosive wildfires. Some have come to realize that ultimately more grass is created by fire than by lack of fire. Thus has prescribed burning become a main method of fire suppression and, to a lesser extent, of grassland maintenance. "Controlled" fire is also increasingly used as a land management tool for various other goals, such as eliminating commercially unprofitable trees from timber harvest areas.

There remains, however, a pervasive, overwhelming bias against natural fire. Few people understand the profound difference between anthropogenic and natural fire. Aside from some more enlightened people at a handful of National Parks and Forests, few public land managers seriously consider allowing natural fires to burn (and those who do are constantly badgered by the public and commodity users). Most prefer fire management because with it they maintain the *illusion of control* over the results. Their job is *managing* the land, and that is what they intend to do! The situation is perhaps worst on public grasslands, where agency staff generally are most reactionary and permittees are not willing to defer grazing for the year or two necessary for grasses to regrow after being burned. Compounding these problems is the fact that fire suppression has grown into a self-perpetuating, multi-billion dollar industry/bureaucracy.

Under pressure from ranching and timber interests, BLM, FS, and states still strongly oppose natural fire. They have a policy of stamping out all wildfires immediately, regardless of the circumstances. BLM boasts that "most wildfires are now brought under control sooner and the acreage burned is less than in the past." A popular Forest Service bumper sticker reads "PREVENT RANGE FIRES."

Of course, as detailed, due to extensive overgrazing much of the West no longer supports fire as it did 150 years ago. This is one of the main reasons the agencies support ranching. Supposedly, with it they neither have to fight so many fires nor use so much prescribed burning to reduce fire danger. Indeed, they commonly promote livestock grazing

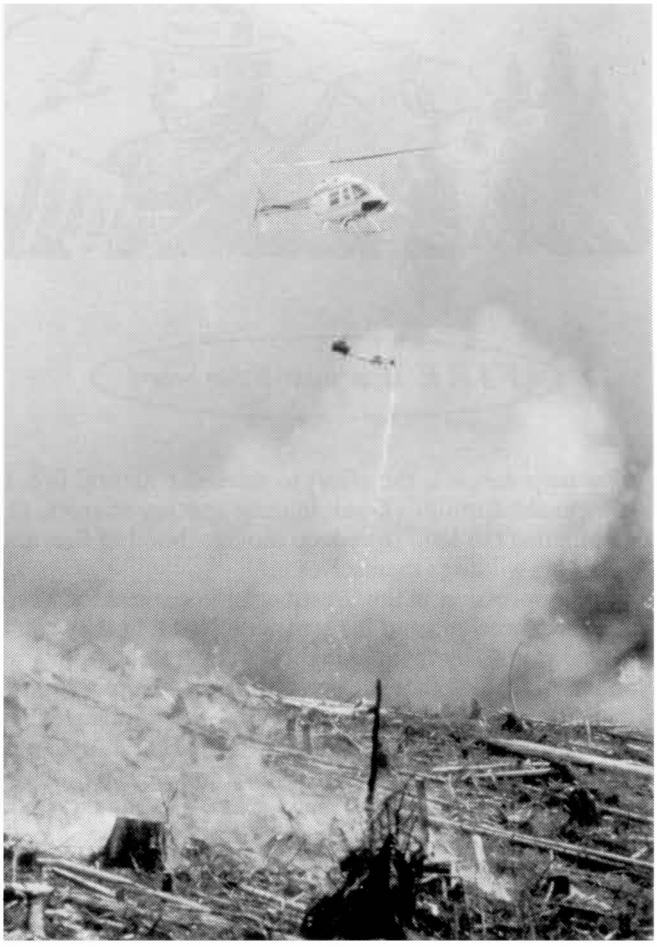
as "the only viable method of reducing the fire danger." This argument recalls the "we had to destroy the village to save it" mentality of the Vietnam War. When grazing is heavy enough to eliminate fire, it *is* extremely destructive environmentally. Often, however, heavy grazing gradually increases the amount of cheatgrass or weedy vegetation, necessitating the prescribed burning it supposedly obviates.

Further, by extinguishing natural fires, managers have in many areas favored larger and more intense fires in the future by maintaining larger blocks of landscape in about the same stage of fire recovery, with few natural fire breaks from previously burned-over areas. A natural mosaic of vegetation is less conducive to major conflagrations than is a uniform vegetation cover.

Additionally, many natural fires are extinguished to protect houses, barns, sheds, corrals, etc. on the thousands of ranching base properties scattered within and around public land; wooden fences, corrals, water developments, seedings, and livestock on public land are also protected. These developments are used to justify destructive fire suppression on hundreds of millions of acres of public land.

Fire fighting activities themselves are also environmentally destructive. A fire fight usually resembles a war zone, and is in fact executed much like a military assault on an enemy position. Scores, hundreds, or even thousands of personnel pour into a natural area, set up a base camp, and send out platoons to skirmish with the enemy. Dozens of heavy vehicles drive where no vehicle has driven before. The base camp quickly becomes a sacrifice area. Fire fighters with chainsaws, pulaskis, and shovels cut miles of fire lines across the land, and bulldozers scrape wide firebreaks through undisturbed country. All brush, logs, and snags with the slightest possibility of containing live coals are cut to pieces. Smoldering duff is ripped off the ground, and smoldering roots are hacked from the earth. Local water sources are degraded and depleted as millions of gallons are diverted to the fire. Aerial bombers drop thousands of gallons of fire-retardent chemical solution as helicopters shuttle personnel, supplies, and equipment.

A personal story provides an example: Years ago at our backcountry homestead in northern California my partner accidentally started a grass fire one dry, windy day. The fire spread quickly through the grass, small plant, and organic litter layer, consuming a bush here and there, blackening the trunks of a few pine trees. We put out about half of the fire ourselves (mostly to keep it off a neighbor's property), but a few dozen Forest Service fire fighters arrived when the fire reached about 7 acres in size. With fire trucks, hoses, chainsaws, axes, pulaskis, shovels, and boots, they did far more lasting damage to the land than the fire ever could have.



Slash burning with helitorch ignition. Removal of woody debris not only prepares the land for timber management, but increases forage and allows cattle and ranchers to more easily move about allotments. *(USFS)*

Many livestock grazing areas are targeted for fire extermination. Ironically, they are often so heavily grazed that fires cannot develop anyway.

Finally, fire research shows that fire suppression frequently has little to do with putting out fires, anyway. *Most* large fires aren't stopped by fire fighting activities but by changes in weather, natural obstacles, or lack of fuel. A good example is provided by the huge Yellowstone fires of summer 1988. They were fought for months at a cost of $120 million, but were finally extinguished primarily by cool, wet weather. As Montana naturalist George Wuerthner observed, "In essence, we often throw money away at fires just so we have the appearance of doing something."

Yet, the above notwithstanding, some Western ecosystems have not evolved with fire. For example, fire has been absent for thousands or perhaps millions of years in some wetlands, the wettest rainforests, the more sparsely vegetated deserts, and in high mountain areas. Ecosystems with infrequent lightning or little fuel build-up may not be prepared for frequent fire. In areas where fire is not a normal occurrence, lifeforms can be seriously harmed by it.

Normally, mere mention of the word "wildfire" is enough to throw stockmen into panic. But, strangely enough, range arson by ranchers is prevalent throughout the West. A stockman knows that if part of "his" allotment is too brushy or otherwise unproductive for livestock, all he needs to do is drop a match in the right place (maybe that chaparral-covered hillside he never liked much) at the right time (say, early afternoon on a hot, dry, windy day), and his problem will be solved.

Several years ago, my family and I were driving along a remote, rocky ranching road on BLM land in west-central Utah, near the Nevada border. We rambled on for some 30 miles through hills, over a small mountain range, and down into a large valley. All along the way, someone had set fires wherever the terrain turned brushy. The blackened areas, numbering 40 or 50, ranged from small patches that didn't have enough fuel to spread far to over an acre. Beyond the thick brush, the land was generally too overgrazed to support fire. Of course I suspected range arson and the next day called the local BLM office to see what their reaction might be. Well, they really didn't know, they said, but, yes, that kind of arson by ranchers was pretty common. No, they never caught them. From their tone, I doubted they ever tried.

To give you a better feeling for the ranching establishment's attitude toward fire on public range, here is another short story: Years ago, before I understood the full value of natural fire or destructiveness of unnatural fire, I took a seasonal job as a fire fighter with the Forest Service in Oregon. I spent most of my time helping cut and burn brush, small trees, and logging slash to make the forest more profitable for timber companies and ranchers, but 6 times that season we were called out to fight fires. Most of these fires were started by lightning, but one in particular seemed to have another derivation.

Said to be the second largest fire in Arizona history, it was a 50,000-acre blaze in the rugged, brushy hills and canyons of the Tonto National Forest north of Phoenix. Local and state fire fighters battled the blaze for a week, then called in reinforcements from other Western states. At its peak, more than 5000 men and women joined the campaign.

After being out on the lines for a few days, it became apparent that our illustrious Forest Service leaders were not actually trying to extinguish the fire, but to contain it within prescribed limits, while keeping it away from human developments. Some of this could be explained as the usual ploy to collect more hazard and overtime pay or reduce future fire danger, but somehow it seemed to go further than that.

One day while our fire crew was resting, the local public lands rancher arrived, and I overhead part of his conversation with one of the fire bosses. The smiling rancher seemed quite pleased with the development of the fire. Said he had no use for all that brush, anyway, as it "choked" the land, and that it was good to get it cleared out so they could get more grass going. Asking around, I discovered that the rancher had been here often, checking on the fire's progress.

Planting livestock forage grasses is usual government procedure after fires of any origin. Thus, when planned with foresight, range arson often results in not only elimination of "undesirable" vegetation, but government-financed grass seedings, complete with associated range "improvements." Every year thousands of "wildfires" of mysterious origin pop up on grazed land all over the West. The agencies are well aware of this practice, though they rarely openly admit it.

We must abandon our dictatorial approach to fire. Range arson should be stopped cold. Natural fire should be allowed to gradually re-establish itself as prescribed burning is reduced proportionately and eventually used chiefly as a protective measure around the perimeters of developed areas. Smaller developments in areas not easily defended from natural fire should be removed or considered expendable. Natural fire should be allowed to reassume its rightful place in the ecosystem.

Seeding

When cows are hungry, ranchers antsy and grumbling, and the public a willing patsy, you get on with the seeding.
--Denzel & Nancy Ferguson, **Sacred Cows**

Seeding is the dissemination of seeds for the establishment of desired vegetation -- thus, the elimination of unwanted vegetation. Seeding species include forbs and shrubs. For example, salt-tolerant shrubs such as fourwing saltbush are considered as having forage potential in arid regions and areas with excessive salinity. However, by far most seedings on public land employ livestock forage grasses.

Motivations for seeding include the usual "promote desirable vegetation," "enhance wildlife habitat," "improve watersheds," "improve aesthetics," and (following fire or other disturbance) "soil erosion control." But, once again, don't be fooled! Whatever the stated goal, forage for livestock is usually the underlying priority on grazed public land.

Seed may be broadcast onto any ground, but chances for success are much greater where a "seedbed" has been prepared. The most common way of preparing a seedbed is eliminating vegetation that would compete with the seeded plants. This can be accomplished through any of the methods of vegetation eradication discussed in this chapter.

Those used most often are prescribed burning, herbiciding, and certain mechanical methods. Most seedings on public land range from a few hundred to a few thousand acres in size.

As on a farm, a seedbed may be further prepared by mechanically breaking apart the soil to loosen it and allow seeds and water to enter more readily. With some mechanical methods, such as plowing, discing, and "ripping," vegetation may be killed and soil prepared simultaneously. The seeding site may also be prepared by mulching and/or fertilization, but due to exorbitant costs these are uncommon on open ranges.

IMPRINTING

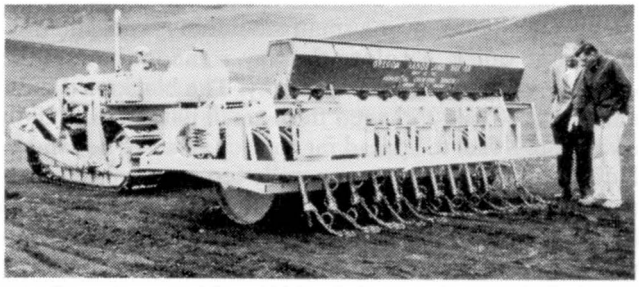
A generally superior method of preparing soil for seeds is called "land imprinting." The "rolling rangeland imprinter" evolved during the 1970s in the mind of Bob Dixon, then a researcher for USDA's Agricultural Research Service (ARS). Dixon eventually was fired essentially because his invention threatened the entrenched petrochemical establishment. His imprinter is a heavy, rolling implement, usually towed behind a tractor. It leaves angular depressions in the soil in which rainwater, topsoil, litter, and seeds (natural or broadcast) accumulate. In cases of severe overgrazing in arid to semi-arid climes, depending on circumstances, this may promote establishment of new growth.

In each area, imprinting's potential benefits must be weighed against its known and potential detriments, such as impact on existing vegetation, small animals, burrows and nests, and archaeological sites; subsoil compaction; noise disturbance; use of fuel; work time; cost; etc. As with all methods of range manipulation, land imprinting should be considered a last resort for those areas where terminating grazing does not heal the land fast enough in relation to other factors. Though much preferrable to herbicides and usually to other methods of seedbed preparation, the imprinter has yet to become a widely accepted alternative.

(Bob Dixon)

Aerial seeding. *(USFS)*

As with herbicides, seeds may be broadcast across the land with aerial or ground equipment, or by hand. Dispersal by aircraft is the usual method following fire. If soil has been prepared beforehand, it may be loose and open enough so that seed eventually is covered by sloughing and settling soil. If not, an area may later be chained over, disced, or otherwise disturbed in order to cover the seed. Or, seed may be "drilled" into the soil with farm-style seed drilling equipment. Drilling is the preferred and most successful method if equipment availability, time limitations, soil type, and topography allow.



A drill seeding machine. *(Unknown)*

Grass species used in seedings vary according to climate, soil type, terrain, competing vegetation, and the kind of livestock to be fed. Generally, native grasses are more nutritious, live longer, grow taller, have deeper roots, and are much better adapted to wildlife. However, introduced species may be more readily established, drought tolerant, livestock-resistant, and, perhaps most important to ranchers, cost-efficient, quick-profit forage producers. So, public range management is geared overwhelmingly toward exotics. Because seed companies sell mostly exotics, native grass seed usually is expensive or unavailable; few in the ranching establishment request natives. Researchers at the Forage and Range Research Laboratory of Utah State University in Logan recently returned from the Soviet Union with more than 1000 species of forage grasses and seed samples which they will evaluate for introduction to the Western range.

Commonly used seeding species include the native fescue and grama grass and exotic Russian wildrye, sweet clover, orchardgrass, African lovegrasses, and others, but crested

wheatgrass is easily the most popular. A cool season perennial, readily established, hardy, drought-resistant, fairly nutritious to livestock, resistant to grazing, and cheap, its admirers call crested wheatgrass "the golden grass" for both its color and the profits it often brings. A native of Turkestan in western Russia, crested wheatgrass was introduced to the West in 1898. Its use spread steadily, and in the latter decades of the 20th century CW has become the focus of a veritable rangeland mania, with public lands ranchers constantly prodding the government to plant more. As of 1990, more than 15 million acres of crested wheatgrass and many millions of acres of other exotic grasses have been seeded on Western federal land, alone, with more on the way.

"Grass seeding" has a pleasant ring to it, and planting grass seems like a positive thing to do. A stand of crested wheatgrass that has taken well may even look impressive -- somewhat like a sparse wheat field.

But, as with fire suppression and so much else, we have unwittingly been conditioned to accept rangeland grass seeding as environmentally beneficial when in fact the opposite is usually true. The heavy machinery commonly used in seeding damages topsoil and organic surface layers, compacts subsoil, and may increase soil erosion. It damages remaining plant roots and crushes small animals. It destroys animal nests, burrows, and habitat. It creates noise pollution, uses fuel, and all the rest.

Seedings take a year or more of protection from livestock to establish, so sometimes wild grazing animals, rodents, seed-eating birds, insects, and other "pests" must be "controlled" -- that is, *killed* -- until that time. (Ironically, some of these "pests" are caused by seedings in the first pace.) Some seedings require follow-up elimination of competing vegetation. Many require the construction of roads, fences, and firebreaks. And a few require fertilization or even mulching to establish well. Rangeland fertilization is geared toward supplying nutrients to seeding vegetation or preferred forage, and these increased nutrient levels sometimes harm native species. Fertilizers may also contaminate waterways and groundwater.

Seedings help spread exotic grasses, often far beyond seeding boundaries. Over the years, with the help of overgrazing, these exotics outcompete and preclude native plants, and thus their dependent animals. Western grasses have evolved with their companion plants and animals for an estimated 26-28 million years; additionally, they are generally more nutritious. Nonetheless, many range managers are only too happy to help the spread of exotics. Some ranchers are known to cavalierly spread exotic grass seed around allotments.

The agencies have been known to mistakenly use the wrong seed. For example, in fall 1988, the Forest Service accidentally seeded 6000 acres of the livestock-grazed Hells Canyon National Recreation Area with a grass seed mixture containing yellow star thistle, an exotic that in quantity can kill wildlife and livestock.

As with other methods of vegetation manipulation, seeding results depend on many unpredictable and uncontrollable variables. Many factors influence seeding establishment: suitability of soil and terrain; precipitation; flood, hail, freeze; seed viability; seed dissemination; seed soil coverage; soil erosion; competition from existing plants; disease or depredation by insects or rodents; and post-seeding management. The result may be a lot of bare dirt and/or a crop of less-welcome plants than those eradicated in the first place. For example, Idaho BLM's Burley District recently proposed herbiciding 1500 acres of a crested wheatgrass seeding "infested with broom snakeweed." Pests often become rampant in simplified plant communities and may eat everything within reach; biotic pathogens likewise more easily infest seeding monocultures. Many seedings receive inadequate precipitation and fail to germinate, or simply shrivel up and die.

But possibly the worst thing that can happen is for a seeding to *succeed*. If it does, hundreds or thousands of acres of diverse plant and animal life are transformed into a sterile monoculture, good for little more than grazing livestock. Because most seedings utilize exotic grasses, they eliminate whatever native plants have survived overgrazing. In fact, seedings commonly support only a few plant species, while adjacent areas (if not too overgrazed) usually support dozens of species of many types.

Native animals are likewise reduced or extirpated. Monocultures of seeded grass, whether native or exotic, support only small numbers of animal species compared to natural vegetation (even if overgrazed). Necessities provided by original vegetation -- food; shade; shelter; cover; nesting materials; mating, resting, and nesting sites; observation perches; territorial markers; and more -- are

This drilled BLM crested wheat grass seeding has taken poorly, leaving mostly bare ground. *(BLM)*

diminished or eliminated. For example, studies show that range seedings reduce numbers of small mammals, and thus the prey base for raptors (Howard and Wolfe 1976). It has been said, only half in jest, that a field of Lehman's lovegrass (a popular exotic) is about as productive as a Safeway parking lot. Even the ranching text **Range Management** by Jerry L. Holechek *et al.* describes "extensive seedings of crested wheatgrass" as "nearly devoid of wildlife." Grass does not an ecosystem make.

Furthermore, the usual life-span of seedings is only 15-25 years, though some may last 30 years or longer (Ferguson 1983). These high-yield exotic grasses tend to deplete soil nutrients. Moreover, although extremely heavy grazing is often recommended to keep other plants from invading, with time seedings invariably deteriorate from overgrazing, competition from other vegetation, and/or inadequacy of sites to sustain them. Then they must be replanted or allowed to return to a more natural state. Range pros usually choose the former. Even if they choose not to replant, depleted sites may take decades to rejuvenate. With continued heavy grazing, they end up in far worse condition than if never seeded in the first place. Thus does seeding beget more seeding indefinitely.

The results of probable range arson: the lighter patches (except snow on mountaintops) are crested wheatgrass seedings. BLM land in central Nevada.

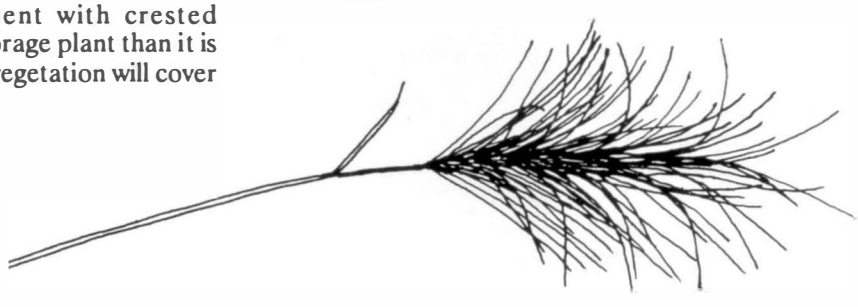
And then, after cattle stamp around the area for a time, soil erosion accelerates. Then the rancher may get a government reseeding project going . . . and perhaps a stock watering project financed . . . and some fencing along the seeding boundaries . . . . And so it goes on our public land.

Range seedings largely are an attempt to farm non-farm land, to compensate for overgrazing while ignoring and in fact furthering overgrazing. Generally, they are expensive, unreliable, and environmentally destructive.

Similar to seedings are "plantings," in which live trees, shrubs, or even cacti are set into the ground. Most rangeland plantings are attempts to revegetate areas denuded by livestock; often riparian areas are re-planted. However, species used are often specifically geared toward providing food for livestock, and grazing is rarely permanently terminated in revegetated areas. Though necessitated by overgrazing private livestock, these plantings nearly always are sponsored by government, often the SCS. Experiments currently are underway with plantings of salicornia and other salt-tolerant plants which might be used as livestock feed in saline desert areas or near the ocean.

Devegetated and seeded previously, this portion of the Dixie National Forest, Utah, was reseeded with wheatgrass in 1953. Today, under the continued influence of livestock, the range is once again covered with scraggly brush. It will probably be reseeded again and again; judging from the sign, the Forest Service actually seems proud of it. *(George Wuerthner)*

As mentioned, though increased livestock forage isn't always stated as the major objective of grass seeding, close inspection reveals that on rangeland it usually is. For example, under pretense of "soil erosion control," burn areas often are seeded by the government with crested wheatgrass. Crested wheat is a better forage plant than it is an erosion control plant, and natural revegetation will cover a burn as well or better in many cases. Often, cattle are heavily grazed on wheatgrass-seeded burn areas only a year or two after fires, devouring the very grass that the government claims was planted to prevent soil erosion.



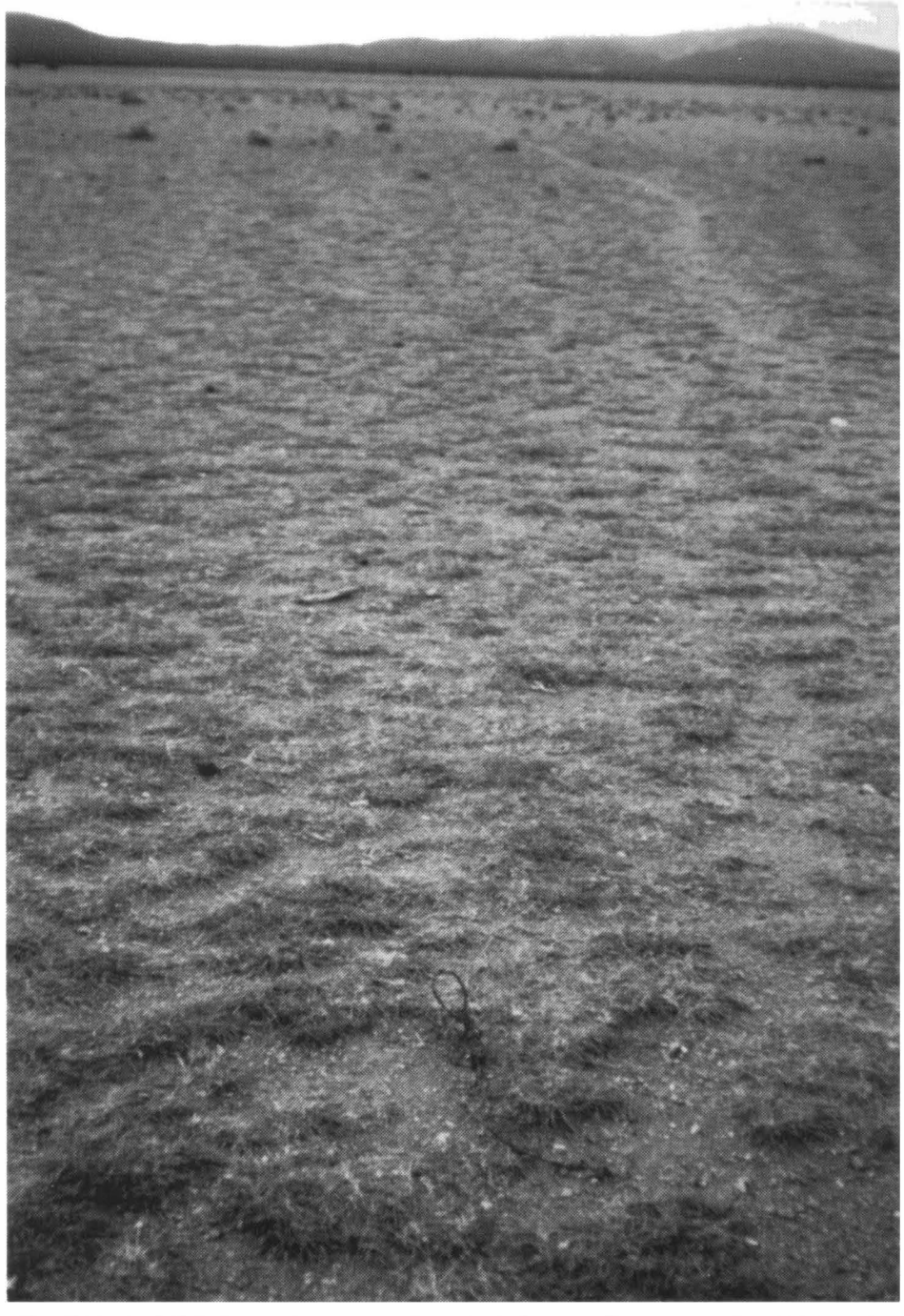
To summarize, though it has done more to destroy livestock forage grasses than any other entity, the ranching establishment is out to abolish nearly all vegetation but livestock forage grasses. Vegetation eradication has degraded tens of millions of public acres, and the industry envisions ever-expanded manipulation. BLM's recent Draft Vegetation Treatment EIS, for example, proposes to increase "treatment" to about 375,000 acres annually through chainings and rollerchoppings, chemical application, burning, and intensive livestock grazing -- in order to "modify desired plant communities" and "to remove undesirable plant communities." Including programs by the Forest Service, SCS, ASCS, FWS, NPS, states, counties, agricultural colleges, ranchers, and other entities, vegetation on probably *more than a million public acres annually* is manipulated for ranching purposes.

It is the frustration and challenge, but indeed also the beauty and reward of range management to conserve and enhance resources not by massive action but by skilled redirection of natural forces. . . . We need to seek better range management technology with unflagging determination. This should be the cornerstone of national range management policy. . . . Surely we should expect to see on every hand a veritable whirlwind of activity in range improvement . . . .

--Boysie E. Day, Professor of Plant Physiology, University of California, Berkeley (USDA, USDI, CEQ 1979)

This livestock grazing, together with the projects undertaken to replace existing vegetation with that favored by livestock, have altered the entire physical aspect of vast expanses of the Public Lands from the native, perennial vegetative complexes to monocultures or essentially bare-ground areas of accelerating erosional activity.

--from a 1973 lawsuit by the Natural Resources Defense Council



Essentially a biological desert -- even more so for being grazed by cattle -- this BLM crested wheatgrass seeding displaces the natural sage/grassland in east-central Nevada.

Animal Enemies

In the eyes of graziers, basically there are 3 requirements for an acceptable environment -- grass, water, and livestock to eat and drink them. All else is questionable, if not expendable, a possible hindrance to profit and power.

The ranching establishment's assault on the environment, therefore, includes campaigns against a huge number and wide variety of animals. Most of the score or so native large mammal species in the West have been decimated by ranching, both intentionally through slaughtering efforts *and* indirectly through the harmful effects of livestock grazing and ranching developments. Indeed, most larger and a great many smaller animal species are in some way assailed as enemies. The mass carnage carried out for the sake of privately owned livestock continues today throughout the grazed 70% of the West, including public lands, and even in adjacent ungrazed areas.

Though definitions given by ranching advocates vary, most animal enemies fall into 4 main subdivisions: Carnivores and omnivores are (1) *predators* if able to kill a sheep, calf, or goat. Herbivores are (2) *competitors* if they eat enough forage or browse to decrease the amount available to livestock. Many smaller animal species are (3) *pests* if they occur in large enough numbers to affect production in some manner. And a huge number of animals are considered (4) *no-goods*, inherently "no good" because they are perceived as possessing some offensive characteristic.

Predators

Nature does not care whether the hunter slay the beast or the beast the hunter. She will make good compost of them both, and her ends are prospered whichever succeeds.
--John Burroughs

A *predator* is an animal that survives by killing and eating other animals. We usually think of large mammals with sharp teeth, but predators include many birds, reptiles, amphibians, fish, insects, arachnids -- a high percentage of species in the animal kingdom. The West supports thousands of predator species, but those that concern us here are the score or so species of large mammals and birds capable of or accused of killing livestock.

Predators and their prey are mutually adapted and highly beneficial to each other. How could such huge numbers and varieties of both have survived together for millions of years otherwise?

Indeed, predators are an essential part of any healthy ecosystem. By culling "inferior" animals, they keep wildlife populations physically and genetically healthy. They help check populations of many animal -- and thus, plant -- species that might otherwise increase in numbers, burden ecosystems, and subject numerous other animals to suffering and death. (For example, predator eradication is a major factor allowing *livestock* overpopulation and overgrazing!) Likewise, predators prevent certain species from outcompeting or overconsuming others, thereby protecting species diversity, which is a key to ecosystem health. They kill animals that fall into situations from which they cannot extricate themselves and that would otherwise die slowly of thirst, starvation, injury, or exposure. Predators remove carrion that would become health hazards. Additionally, they provide aesthetic and recreational enjoyment, and scientific and symbolic meaning to humans. Perhaps most important, predators are natural beings with the will to exist.

The Kaibab mule deer herd offers a famous example of what can happen when predators are removed from an ecosystem. The setting was the beautiful, forested, high plateau on the north rim of the Grand Canyon, where some 20,000 sheep and cattle had been introduced in the late 1800s. Before 1906 an estimated 4000 Rocky Mountain mule deer shared the plateau with the livestock and many predators.

In the early 1900s tourists, including some of America's most powerful people, enjoyed watching the mule deer in the meadows. With their support and under recommendation from government authorities, President Teddy Roosevelt -- rancher, big game hunter, and selective wildlife advocate -- in 1906 declared the area a national game preserve. Subsequently managed to maximize the deer population, soon even the cattle and sheep were removed to make room for more deer. Federal trappers were sent in. They exterminated the area's grey wolf population and killed more than 700 mountain lions, 5000 coyotes, 500 bobcats, uncounted eagles, and non-target species.

Without competition from livestock, under protection from hunting, and with few remaining predators, the deer population exploded, increasing at an estimated 20% per year. In 1924 the number on the Kaibab Plateau was estimated at 100,000. Apparently the plan to increase deer numbers had worked . . .

. . . far too well. For as the deer increased in numbers they intensely overgrazed the plateau, stripping shrubs bare, eating leaves and twigs from trees as high as they could reach, devastating grass and herbaceous ground cover. In many areas, an estimated 80%-90% of the forage was gone.

Now, 80%-90% denudation of forage is common on livestock allotments, and people rarely take notice. But when it is caused by wildlife on a popular national wildlife preserve overlooking the Grand Canyon, overgrazing becomes a major crisis. For years, controversy raged over what should be done.

In the meantime, Nature took care of the problem. Between 1924 and 1930, an estimated 80,000 deer starved to death. Another 10,000 died between 1930 and 1939. Today,

predators are still too few, and it is said that the Kaibab deer herd of perhaps 10,000 is still damaging the plateau environment. Yet, livestock also currently graze most of the plateau, and to anyone who knows the area their destructive impact is obviously far greater than that of the deer. The grazing establishment still kills predators on the plateau.

Undoubtedly, the major sources of prejudices against predators are the stories told by those who kill them: the ranchers, hunters, trappers, and even some biologists working for the government with monetary interests in predator elimination.
--Bob Jessup, wildlife biologist, author

Despite expanded ecological research and modern information dissemination, predators remain maligned and misunderstood. Much of our society still vilifies them as immoral, bloodthirsty killers to be scorned, feared, and hated.

The fact is a predator kills to eat -- whatever acceptable prey is available and within its capability, generally as quickly and efficiently as possible. It is guided by hunger and instinct, not driven by bloodlust and cruelty. It feels no hate, no guilt, no remorse doing what comes naturally. And, in the West, aside from grizzly bears, predator attacks on humans are almost unknown.

A man who kills more game than he'll ever need calls himself a sportsman. But if the same fellow finds a coyote that has killed more than it needs, he will call the animal ruthless and greedy.
--Jed Hill, Southern California old-timer

Most hunters condemn predators because of their depredations on game species. They see predators as competitors. Yet, in the biological web, the number of prey more determines the number of predators, not the reverse. As humans overpopulate and degrade the Earth, they are the cause of most competitive conflict; predators have always been regulators of the natural balance that prevents conflict.

Some animal advocates, hoping to save "cute" animals from "cruel death" at the jaws of predators, would like to see predators eliminated from some areas. They don't understand Nature.

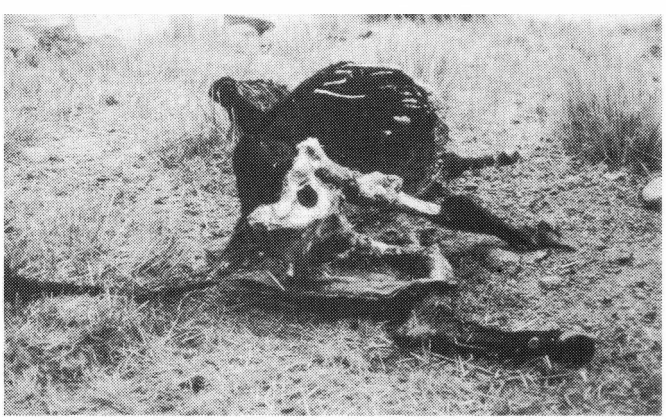
And stockmen, more consistently and vehemently than any, damn predators for more evils than even humans are capable of. They say that predators kill out of viciousness, cruelty, and even "for fun" (as evidence, they frequently exhibit gruesome photographs of predator victims). Allegedly, predators are cold-blooded murderers that wantonly attack and "steal" their innocent livestock. Without predator "control," they say, Western ranching surely would be wiped out by these homicidal maniacs. They insist that predators and livestock cannot co-exist. They are perhaps right only on this last count.

We have laid out an incredible feast of livestock on our public lands. In a very real sense, we *are the intruders.*
--Marty Stauffer, from the TV series *Wild America*

Ranching, not predators, is the real problem. As livestock grazing and range development exterminated most of their wild prey, predators were forced to eat livestock. A degraded biosystem makes for poor hunting, unstable prey populations, and hungry predators. Overgrazing also eliminated the tall grass needed by livestock mothers to hide their newborns and young from predators. Thus, in traveling about the West, one generally finds the greatest incidence of livestock predation on the most overgrazed ranges.

Then, too, domestic animals, having lost most of their ability to evade predators, make easy prey. Studies show that through evolution each kind of predator has an ingrained sense -- composed of shape, smell, movement, etc. -- of what constitutes its natural prey. Scientists call this its "prey image." Though this instinct guides them in hunting, when their natural prey is gone, predators often must necessarily turn to livestock to survive. Discovering what an easy meal sheep or cattle make in the midst of a ravaged habitat, many understandably develop a dependency on livestock.

Even so, when predators do prey on livestock, generally they take the weakest animals. (On overgrazed ranges all livestock may be weak, and this is much more true of cattle than sheep.) In this way, predators cull animals that perhaps should not survive to suffer, spread disease, propagate inferior genes, or ultimately be sold to unsuspecting consumers. Needless to say, few ranchers appreciate this free service.



Though livestock may die from any number of causes, if the cause is unknown stockmen usually blame predators.

Predators often are wrongly blamed for killing stock. Very few predator kills are actually seen by people. Yet, when a rancher discovers a coyote, bear, or eagle feeding on a sheep carcass, he commonly *assumes* it was killed by the predator, though there is a good chance the sheep died from disease, infection, exposure, poisonous plants, or a gunshot wound from a disgruntled hunter. In one study, professional autopsies showed that only 10% of the dead livestock studied were actually killed by predators.

When a rancher finds a predator-killed sheep or cow carcass but no predator, he often goes after *all* predators in the area, sometimes those not even capable of killing the dead animal. Wildlife biologist Bob Jessup puts it this way: "Instead of tracking down the one animal responsible for livestock losses, ranchers usually find it preferable to begin a regime of unselective poisoning and trapping -- on their land or open [public] range -- killing hundreds of individuals, and possibly missing the one actually responsible for livestock attacks."

I remember once telling Jewel Smith [an old rancher] *about a friend seeing a young Black Bear treed by Coyotes in the Gila Wilderness. "Why didn't he shoot that li'l bear," she asked, "and the coyotes, too?" It was inconceivable to her that anyone would see a varmint of any sort and not kill it.*

--Dave Foreman, **Confessions of an Eco-Warrior** (Foreman1991)

Many predators are killed not because livestock have been killed, but simply *because they are predators*. For generations stockmen have habitually killed all the predators they can, as casually as most of us swat flies. Killing predators also gives many stockmen a psychological boost -- a feeling of doing *something* to improve ranching conditions; some ranchers are essentially *addicted* to killing.

No quarter was given to the predators. They were regarded as bad animals -- evil creatures that attacked human beings and livestock alike; therefore, they were proscribed and pursued whenever and wherever they appeared.

--**Wild Enemies** by J.J. McCoy, naturalist and former rancher (McCoy 1974)

Probably no aspect of public lands ranching stirs such emotions or has induced such a plethora of publicity as its brutal predator "control" effort. Though surely not the most environmentally harmful of the industry's general activities, it is considered by many to be the most disgusting. Perhaps no issue reveals so well the true nature of the power exerted by Western stockmen. Even with growing public opposition, the ruthless butchery that began when ranchers took control of the rangeland West more than a century ago continues unabated. The various ways the ranching establishment kills predators are described below.

•Guns

12-gauge pump shotgun loaded with BB shot is good for hunting pups that have left the dens but are still together. They may be found lying under sagebrush or among rocks and are more easily hit with a shotgun than with a rifle when they start to scatter.

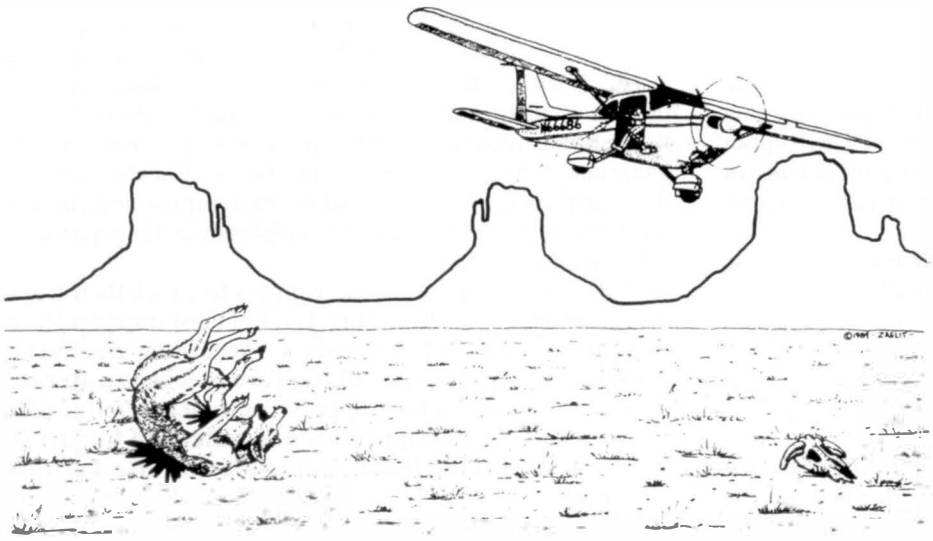
--from **The Clever Coyote** by Stanley Young and Hartley Jackson (Young 1978)

More than anything, Western cowboys are famous for their guns -- their "most faithful companions." In the grazing industry's formative years, predators were shot whenever they were seen. Even today most ranchers carry rifles in their pickup trucks and many shoot at every predator and stray dog they see (if they aren't able to run over them first). Many hunt predators with trained dogs or hire others to do so. The animal is tracked down, cornered or treed, and shot. Some lure and shoot predators using special calls that sound like prey in distress or like animals seeking others of their species. Some use scent lures. Little of this slaughter has much to do with livestock protection, but is done "on principle," "for sport," or because, as Champ Clark writes in **The Badlands**, "killing varmints helps ease frustrations."

Under various state and federal wildlife protection and game laws, much of this shooting is technically illegal. But nearly all of it occurs in remote areas where getting caught is unlikely. Getting charged and punished is even more improbable. Most Western state stock killer laws are so loosely worded and weakly enforced that ranchers may shoot predators essentially at will.

Government predator "control" agents have gunned down millions of large predators since the early 1900s, including many thousands of stray dogs. With the ban of many predator poisons in 1972, they have stepped up the shooting spree, often using helicopters or fixed-wing aircraft. Typically, aerial predator "control" agent-"sportsmen" chase coyotes until they drop from exhaustion or roll over and expose their vul-

From The Coyote: Defiant Songdog of the West. Revised & Updated by Francois Leydet. Copyright (C) 1977, 1988 by Francois Leydet. Used by permission of the University of Oklahoma Press.



(John Zaelit)

nerable underparts in a canine plea for mercy. Or coyotes are lured into the open with helicopter or truck placements of "bait draws." Then they are shot with 12-gauge shotguns or high-powered rifles. These aerial killers are especially deadly in winter, when snow is deep and predators have few places to hide. Francois Leydet describes the organization of one of these aerial hunts in his excellent book, **The Coyote**:

> *The operation, directed by ADC* [Animal Damage Control] *district supervisor Wes Bonsell, was organized like a military campaign. There were the ground forces -- ADC field district assistants Arnold Bayne and John Foard, and ranch manager B.W. Cox, in the pickups. And there was the aviation -- the B.A.F., as I came to all it, Bonsell's Air Force: the Supercub spotter plane, with Wes riding as spotter, and the gunship helicopter.* (Leydet 1977)

Many wealthy public ranchers think it great sport to spend the weekend shooting coyotes from their own private aircraft. One in Wyoming patrols "his" public lands sheep allotment in his noisy ultra-light, shotgun in hand.

At least 1/3 of animals shot do not die immediately. Many live out their days in agony, dying slowly from infection or starvation. Others are crippled for life. Commonly seen on the Western range are coyotes and other predators with legs, jaws, and other body parts shot off.

• Traps

> *Few men could endure to watch for five minutes an animal struggling in a trap with a crushed and torn limb . . . Some who reflect upon this subject for the first time will wonder how such cruelty can have been permitted to continue in these days of civilization.*
> --Charles Darwin, 1863

The first traps set by Western ranchers to kill predators were snares. Snares usually involve a noose that constricts around a trapped animal's neck, choking it to death under its own weight or holding it until the rancher comes by and slays the animal. Large animals trapped in snares often struggle for hours or days before finally dying. Leg snares are also used. Wire leg snares often strip the skin and flesh of a struggling animal's leg right off the bone. Most non-target species caught in snares must be tranquilized to be removed alive. Few trappers carry tranquilizer; thus, most non-target snare victims are killed. Ranchers and government agents still commonly use snares to kill predators.

In the past, another method of "trapping" involved staking a tame wolf, one raised in captivity, where it would attract a wild one. A man hiding downwind behind a tree or rock would then shoot the wild animal.

Another method still used to kill large predators is digging a large pit and lining the bottom with sharp, upright "pungi sticks" (such as were made famous by the Vietnam War). The pit is carefully covered and camouflaged, and the large animal (possibly human) that falls into it is impaled and usually killed.

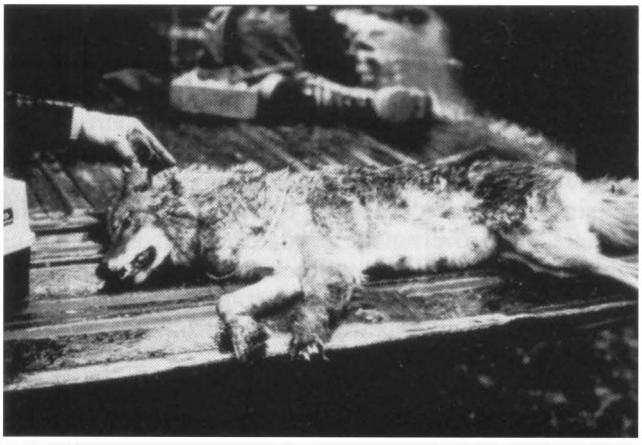
The leghold trap was invented in medieval Europe by wealthy land barons to catch ***human*** trespassers and poachers. The metal, spring-loaded leghold trap was introduced into the US in 1840 and has remained virtually unchanged ever since. Its use spread quickly throughout the continent, revolutionizing the trapping industry and increasing stockmen's ability to kill predators. Today, ranchers and government predator "control" agents use leghold traps extensively. Stockmen also discretely encourage, assist, and/or hire private trappers to kill predators on private and public lands. Their motto: "The essence of trapping is secrecy."

Public domain in northern Arizona.

A predator trap is placed in a location where the intended victim is likely to come across it. A meat or scent bait is placed in or about the trap as a lure and the trap is set. When the victim steps into the trap, powerful jaws snap shut and the animal's leg is held firmly, as in a vise. The trapper then comes by, dispatches the animal with a rock, club, or gunshot, and resets the trap. This is the best-case scenario, anyway.

The reality is usually even more unpleasant. When the steel jaws snap shut, the trapped animal suffers immediate pain said to be similar to that of a car door slamming on a human hand. Often leg bones are broken. A study by the Louisiana School of Veterinary Medicine showed that more than 90% of coyotes caught in leg-hold traps suffered broken bones (Grandy 1989).

Oddly, a broken bone may be the desperate animal's best hope, for the break may allow it to yank or chew off the trapped limb segment completely -- what trappers term "wringing off." Most of these animals later die from starvation, predation, or infection. But some survive, and consequently many 3-legged coyotes, bobcats, deer, and other animals hobble about in the wild.



This non-target trapping victim -- a lactating female coyote -- was later released with an amputated foot, and survived. *(Paul Tebbel)*

(Dick Randall)

Large animals may be trapped on the leg, foot, nose, or head. On small animals the trap may snap shut on almost any part of the body. As a trapped animal struggles to free itself, the steel jaws slowly work into its flesh, often to the bone. Muscles, tendons, and ligaments are torn, cut, and crushed, while often blood flow is cut off. Bones may be broken or dislocated as the animal thrashes about to free itself. Some animals go into shock and die. Some suffer gangrene. Some are eaten by predators. Babies starve to death in their dens and nests while their imprisoned parents await their fate. Mates stand by helplessly as their partners suffer in jaws of steel.

Western state laws require trappers to check their traps at regular intervals, often every day. But most trappers leave their traps unattended for days. According to several government trappers, leghold traps are checked an average of twice a week, or "at the trappers' convenience," often only on weekends. Thus, trapped animals suffer and frequently die from exposure, thirst, starvation, or attacks from predators.

When the trapper finally does come by, the animal may suffer more severe pain. Wild animals usually don't die easily, and many are stoned to death or succumb to multiple wounds from a gun, shovel, or club.

(John Zaelit)

A Denver Wildlife Research Center study, aimed at coyotes, reported that of 1119 animals trapped, injured or killed [by USDA's Animal Damage Control], *only 138 were the targeted coyotes. The remaining victims consisted of 21 non-target species, including hawks, golden eagles, song birds, rabbits, and deer, as well as 63 domestic animals.*

--Tanja Keogh, *U.S. Predator Control -- a Legacy of Destruction* (Keogh 1988)

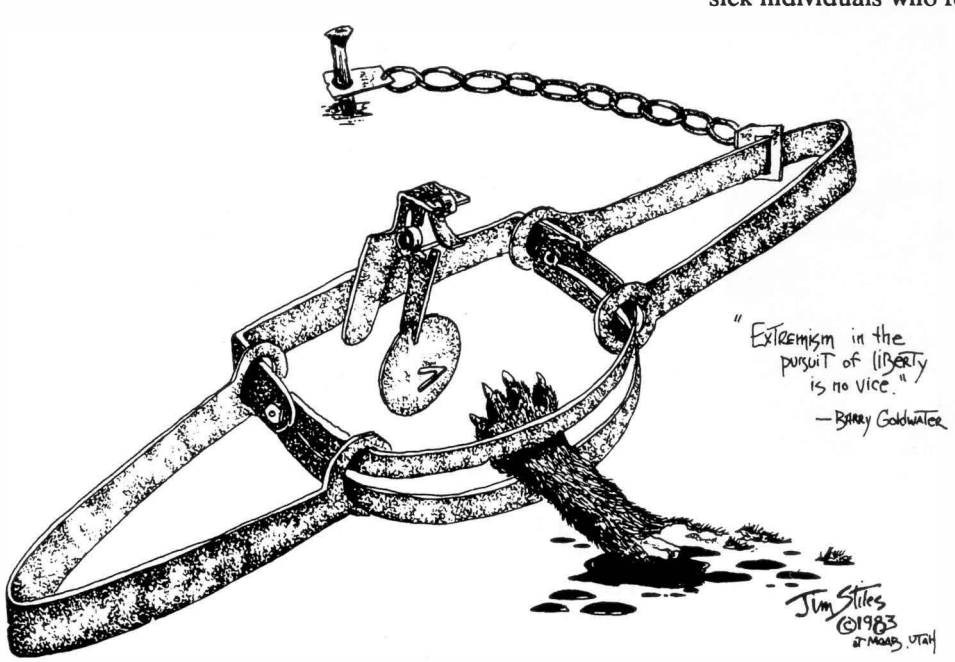
In livestock areas, traps are most commonly set for coyotes, mountain lions, bobcats, and bears. But traps are indiscriminate. Any animal attracted to the bait or happening by may fall victim. In fact, most reliable studies and expert testimony have shown that between 2/3 and 3/4 of animals trapped are "non-target" species (Keogh 1988). Casualties include many deer, wolverines, martins, badgers, beaver, opossums, porcupines, raccoons, skunks, rabbits, ringtails, javelina, armadillos, groundhogs, humans, eagles, hawks, owls, vultures, crows, ravens, magpies, wild turkeys, quail, songbirds, kingfishers, tortoises, domestic dogs (frequently) and cats, domestic livestock (!), and many others. For example, ADC reported "inadvertently" killing 555 badgers, 1117 raccoons, and 764 javelina in 1988 (Satchell 1990) (numbers of unreported victims are undoubtedly much higher). Says Dick Randall, a federal predator "control" agent for 10 years, now working to protect wildlife, "my trap victims included bald and golden eagles, a variety of hawks and other birds, rabbits, sage grouse, pet dogs, deer and antelope, badgers, porcupines, sheep and cows" (Malachowski 1988). This, from a skillful and conscientious trapper. Most ranchers are little bothered by killing these non-target animals; indeed, as detailed later in this chapter, many would just as soon eliminate most of these "troublesome" animals.

Trappers keep or sell many of these non-target animals for their fur, meat, feathers, etc. Though many of those animals they don't keep are found dead or must be killed, some are well enough to be released, often after having their foot cut off. Of these, many are permanently disabled or so seriously injured they eventually die. One study showed that 25% of released animals appearing to have no injuries were subsequently found to have died from gangrene as a result of prolonged constriction of blood flow in the leg.

Another trap less commonly used is the so-called "killer" or body-gripping trap, also termed a "conibear." This spring-loaded device snaps shut with great force on whatever portion of the victim's body enters the open square and activates the tripping mechanism. The animal is crushed or suffocated. Unfortunately, of conibear trapping incidents studied by the US Humane Society, "Nearly 50% of the animal victims did not die, but suffered serious injuries, sometimes for days (Grandy 1989)." Ranching interests usually set conibears at the burrow entrances of suspected predators and competitors.

> *I mentally totalled up our "score"* [for the day]*: a raccoon, a fox, a hog-nosed skunk, shot and killed; a fox, a ringtail, a raccoon, released with the loss of a foot; a fox, a raccoon, and an ewe released unharmed. Forty-three traps re-set and re-baited, now all ready to spring. And all for what? Because of an unsubstantiated report that a coyote's track had been seen in the area!*
>
> --Francois Leydet, **The Coyote** (Leydet 1977)

Trapping on public land, though prevalent, is an obscure, secretive, nearly unregulated activity -- and trappers prefer it that way. Much of it is illegal, and nearly all of it is cruel and environmentally destructive. A common misconception, one that stems largely from our romantic image of the Old West "mountain men," is that trappers are rugged, outdoors-loving sportsmen who trap on foot or horseback. In truth, most are professional predator and/or fur trappers who run scores of traps from 4-wheel drive pickups and jeeps, often off-road, to the further detriment of the land. They may take hundreds of animals, and some make tens of thousands of dollars annually. Many "hobby" trappers also use public land, but even they rarely walk more than half a mile from their vehicles to and from their traps. The inherent nature of trapping seems, generally, to attract the unintelligent, inept, and irresponsible. Indeed, a long-term computer operator at NCIC (National Crime Investigation Center) remarked once that he had never run the name of a trapper through the system that didn't have a yellow sheet. (Marten 1991). An amazingly large percentage of trappers are felons. It is clear to me that many trappers are simply sick individuals who feel the need to kill or hurt, and trapping offers them one of the few culturally and legally sanctioned means of doing so.



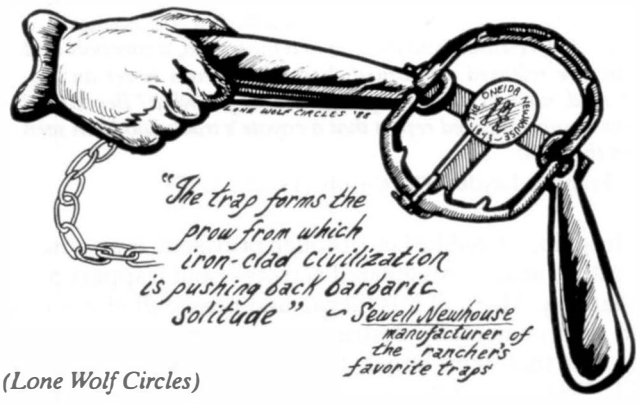
(Jim Stiles)

There is a growing movement in this country to outlaw the steel leghold trap, as it has been in at least 65 other countries. (All leghold traps I find end up in thick brush or deep water.) But, as usual in the West, the ranching industry still pulls the strings, and the trapping continues.

For more than 50 years, the American Humane Association in Denver has had a standing offer of $10,000 for the invention of a humane trap. To qualify, the trap must be efficient and economical, practical for widespread use. No one has collected the $10,000. Could it be there is no "humane" way to take wild animals from their homes?

Three out of four animals caught in traps are non-target or "trash" animals, including pets and endangered species. Fewer than 1% of all trappers rely on trapping to make their living. Trapping targets healthy animals that would otherwise survive. Health officials now say trapping does not control diseases, and may even promote their spread.

--The Compendium Newsletter (May-June 1989)



(Lone Wolf Circles)

• Poisons

A 1979 U.S. Department of Interior Fish and Wildlife study by Dr. Stephen Kellert of Yale University deals with public attitudes toward critical wildlife and natural habitat issues. This included public opinion toward the use of poisons to minimize agricultural loss due to wildlife. . . . Sheep producers and cattlemen strongly approved of poisons and constituted just about the only group in the entire study to favor this control strategy.

--From the report, *1080* (Defenders of Wildlife 1982)

(Dick Randall)

Poisons are the cheapest way to kill large numbers of predators. During the early years of Western ranching, the predator "control" arsenal acquired various deadly poisons -- arsenic, strychnine, sodium cyanide, and others. These were inserted into bait, usually meat or carcasses of cattle, sheep, deer and other foods favored by predators.

The 1940s ushered in a whole new era of predator eradication with the introduction of the extremely lethal toxicants thallium sulfate and sodium monofluoroacetate (Compound 1080, or "1080") -- developed in Germany during World War II. They replaced many of the older poisons and soon became widely popular.

Also introduced in the 1940s was a revolutionary, deadly new predator weapon. The "coyote getter" is a pistol-cartridge-powered cyanide gun that fired a puff of deadly sodium cyanide dust into the mouth of any carnivore, omnivore, or carrion-eater that tugs on its scented wick. On contact with the moisture in the animal's mouth (or eyes, or wherever it hits) gas is released and the animal is gassed to death (or blinded). A highly effective killer, the coyote getter quickly gained widespread use. Eventually it was usurped by a newer model, the spring loaded "M-44" (sounds like a war, appropriately) coyote getter, which is still in use today. Over the years coyote getters have killed countless thousands of predators, non-target animals, and even a few humans.

(John Zaelit)

During the heyday of the predator poisons, the public didn't have any idea that Western rangelands, mostly public land, were laced with every kind of poison known to humans.

--Dick Randall (Pacelle 1988)

During the 1950s and 1960s, poisons became the rangeland rage. Contaminated livestock carcasses were routinely left on grazed land across the West. Meat baits tainted with 1080 were placed at 6 mile intervals in huge grid patterns over vast areas. From trucks, horses, trail bikes, and airplanes, millions of strychnine-laced tallow pellets were scattered over the Western landscape, even where no livestock grazed. In 1970, the Division of Wildlife Services alone set out 10,800 Compound 1080 baits, 805,000 strychnine baits, and 32,933 coyote getters. According to government-calculated toxic kill patterns, just these 1080 baits alone were estimated to be sufficient to poison 248,832,000 acres for coyote "control" -- an area 2 1/2 times the size of California. Other federal agencies, states, counties, and ranchers waged their own, even more secretive poison wars.

These deadly poisons took their toll on much more than predators. Wildlife experts estimate that more than 2/3 of poison kills are non-target animals. Of course, to a large degree results depend on the skill of the handler, and some

poisons are more specific than others. But relatively speaking most predator poisons are indiscriminate. And most were over-applied irresponsibly and often illegally.

Millions of non-target animals have been killed, including scavengers such as crows, ravens, jays, magpies, eagles, hawks, badgers, weasels, mink, raccoons, ground squirrels, bears, dogs (including sheep dogs) and cats, and any other animal attracted to dead meat. For example, poisons, traps, and degradation of habitat by livestock were chiefly responsible for extirpating the wolverine from more than 2/3 of its native range. According to ex-predator "control" agents, they were encouraged by their superiors to ignore and not report non-target deaths.

These rodents were trapped, are now being inserted with poison, and will be left out on the range to kill predators. *(Dick Randall)*

Opposition to range poisons grew during the 1960s and early 1970s, chiefly as part of the growing environmental movement. Thallium sulfate, nonspecific and slow to kill, was finally banned in 1967. Predator exterminators turned to 1080. But 1080 is little better. According to one source, "The symptoms of 1080 poisoning appear in from 30 minutes to 2 hours and are characterized by severe convulsions. Death ensues in two to three hours and there is no known antidote." Former EPA Administrator William Ruckelshaus called 1080 "one of the most dangerous toxics know to man." Less than 1/500 of an ounce will kill a grown human. It decomposes only when burned or immersed in large quantities of water, is white, tasteless, odorless, water soluble, easily absorbed through stomach, lungs, or breaks in the skin, and has been evaluated and listed as desirable for use as a chemical warfare agent by the military. So potent is 1080 that, like DDT, it can kill as many as 5 animals in a bioaccumulative chain reaction. According to the EPA, "1080 is highly toxic to all species," and according to authorities, prior to 1963 there were at least 13 fatal cases, 5 suspected deaths, and 6 non-fatal cases of 1080 poisoning in humans. Between 1974 and 1982, the Rocky Mountain Poison Center in Denver, alone, was consulted on treatment of about 100 cases of poisoning by 1080 and 1081 (a very similar toxin used chiefly as a rodenticide) (Defenders of Wildlife 1982).

The photo at top shows federal agents injecting sheep carcasses with 1080. Above, a badger is dead after eating from a poisoned sheep carcass. *(Dick Randall)*

Finally in 1972, after the highly publicized 1080 deaths of many eagles in Wyoming, President Nixon signed an executive order halting the use of all poisons to kill predators on federal land. Unfortunately, rancher Ronald Reagan eagerly rescinded the order in 1982, reinstating the use of sodium cyanide and 1080 in sheep collars -- a "trial balloon" for 1080. The grazing industry is the main force behind the effort to bring 1080 back into general use, and under a sympathetic George Bush this may soon be the case.

Today some Western sheep ranchers fit their animals with collars (cost: about $20 apiece) containing pouches of concentrated solutions of Compound 1080 -- "enough to kill 300 25 pound dogs" or "26 children weighing 35 pounds each." When a sheep dies or is killed, the animal that consumes it ingests the poison, then dies and transfers the poison to various scavenging larvae, worms, beetles, birds, and mammals, which in turn pass it on to others. Even sheep themselves sometimes die from eating vegetation contaminated by 1080 collars punctured by thorns or barbed wire. Tests show that for many reasons the collars do not work as intended. (Defenders of Wildlife 1982)

(George Wuerthner)

One recipe for death calls for a number of live coyotes to be tied up and their mouths wired shut. While they are being tormented in this way, adrenaline pours into the terrified animals' systems, creating strongly scented bladders and anal glands, which, when cut out of the still-living animals, provide "passion" bait for poison stations.
--Hope Ryden, **God's Dog**

Most poisons are still legally unavailable for use on range predators, but according to Dick Randall, "there has always been a black market for strychnine, 1080, and others." Many toxicants are smuggled in from Mexico, where they are legal. And other over-the-counter pesticides, such as the dewormer Warbex, are readily available. Randall adds, "the 'grapevine' has told ranchers that if they want to kill something they don't need strychnine or 1080 -- they can go out and buy these pesticides which will do even better because they [broad spectrum pesticides] kill everything" (Pacelle 1988). Some stockmen even use toxic Prestone antifreeze. Ranchers are currently lobbying heavily for the legal return of 1080, as well as strychnine and other deadly poisons.

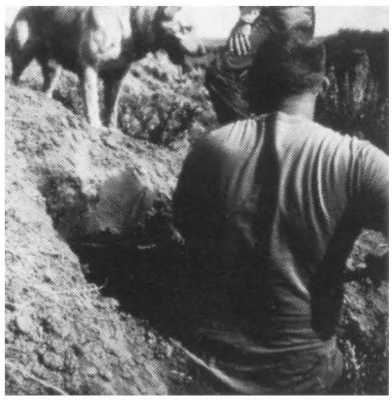
Poison advocates argue that toxins are a humane alternative for killing predators. Yet often predators and, especially, non-target victims don't eat enough poison to die "quickly" and instead suffer for hours, days, or weeks. They may wander the landscape in torment or writhe on the ground, wracked by pain, dying gradually or eventually recovering. Even under the best of circumstances, most poisons cause agonizing pain before death.

. . . a frenzy of howls and shrieks of pain, vomiting and retching as froth collects on his tightly drawn lips . . . A scant six to eight hours after eating his meal, Mr. Coyote is breathing his last, racked [sic] *by painful convulsions,* [dying from] *the most inhumane poison ever conceived by man . . . .*
--Montana rancher, State Senator Arnold Rieder, describing the effects of 1080 poisoning in a newspaper article (Strychnine is said to be even more painful, though quicker.)

•Denning

Another method of killing predators is "denning." The object of denning is to kill predator young, usually coyote pups, sometimes foxes, wolves, mountain lions, bobcats, or others, in their dens. There are dozens of forms of denning, all of them gruesome. If possible, the denner simply digs back into the den and strangles the young barehanded, shoots them, or kills them with any implement at his disposal. In another form, a piece of barbed wire is shoved into the back of the den and rotated until it catches on a pup or kitten's fur. Or a hook may be used. The youngster is then fished out and shot or its head is bashed in. In another form of denning, the inside of the den is turned into a blazing inferno with a flamethrower, or filled with poison gas. One form involves smoking the animals out with a smoke bomb or fire and dispatching the choking, blinded pups or kittens with a club or shovel. In still another, dry brush is packed into the den hole and set on fire, and the entrance is covered with a rock. In theory, the animals suffocate from the smoke, but, as Dick Randall relates:

Coyote pups. *(Dick Randall)*



Digging out a coyote den. *(Dick Randall)*

(Dick Randall)

. . . they'd often end up scrambling for the cracks of light at the entrance in desperation. You could hear them yowling when they hit the flames. They burned alive." (Malachowski 1988)

(Dick Randall)

(Dick Randall)

• Dogs

Trained dogs -- usually hounds -- are used to pursue and tear apart their wild predator cousins, to lure coyotes into the open for shooting, and to locate dens. Government predator "control" agents sometimes use these methods, but many more ranchers own such specially trained dogs. Commonly they train their dogs to chase and kill *any* wild animal encountered.

• Non-lethal methods

There are non-lethal means of discouraging predators, but most are expensive and/or ineffective, and most stockmen harbor deep antipathy toward predators and prefer to kill them. Hog wire or wire mesh sheep fences are used in some sheep grazing areas. They are expensive and rarely keep predators away completely, so they are usually considered supplementary protection. Electric fencing has shown to be likewise. Guard dogs have been effective in keeping predators away in some cases, though they necessitate additional human supervision and monetary expense. According to an article in *Arizona Highways*, public lands rancher Bill Conway "welcomes [his guard dogs] barking all night because it deters coyotes and mountain lions." Wildlife and visitors to public land might not appreciate the all-night barking as Bill does. Some ranchers herald guard donkeys as the solution, while others say llamas, ostriches, or emus. Intensive livestock herding has also been promoted as a predator preventative. Supposedly, the natural instincts of a large herd cause it to fight off predator attacks more effectively. There is some truth in this, but a large, densely packed herd requires extensive fencing or humanpower (money) to keep it together, and livestock have lost much of their herding instinct through domestication. Other predation-reducers include shed-lambing, providing winter shelters, removing carrion from lambing and calving pastures, and simply more vigilant human supervision.

> *The battery-powered sheep collar features flashing lights and sirens, all electronically triggered by the sheep's sudden movement when attacked by a coyote. . . . After 10 seconds, the alarm automatically shuts off for 10 minutes, allowing the excited sheep to calm down, then resets itself. An electric eye activates the collar only at night, when most coyote attacks occur.*
> --*High Country News* (8-1-88)

Non-lethal methods also include bells, warning sirens, taped recordings of scary sounds, other sound-repelling devices, bright lights, wild colors, electric shockers, and other generally ineffective and often daffy deterrents. Hundreds of non-lethal methods of thwarting predators have been tested by the government in recent decades, including repellent and aversive scents, attractive scents (to draw predators elsewhere), and antifertility agents, none of which have gained much acceptance. Consider this one by the University of Wisconsin and the US Fish & Wildlife Service's Denver Research Center: "this approach involves an attempt to make coyotes 'allergic' to ovine antigens so that a depredating coyote would react in the form of a fatal

anaphylactic shock or a sufficiently painful response to constitute an aversive stimulus."

All the above non-lethal methods are environmentally obtrusive and/or harmful. While differing factions debate the merits and demerits of various predator "control" methods, completely ignored as always is the most important question of all -- what are livestock doing on public lands in the first place?

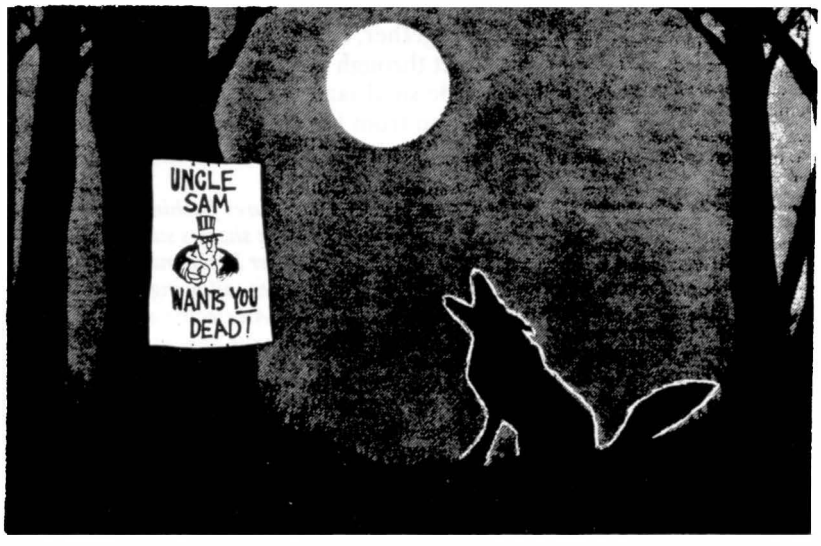
We run most of the coyotes on our ranch with pickups. We must have had three our four chases a week in 1973. Everything stops when you do this. You pile into the pickups, and go racing across the country after him at top speed, whatever the terrain . . . [then kill him].

--Ellis Whitney, public lands rancher, 4-term New Mexico state legislator

Some ranchers torture captured predators. They purposefully leave them in traps to gradually die from thirst, starvation, or exposure. They may slowly torment trapped animals by beating, stoning, burning, shooting, or slashing them. Or they may saw off their lower jaws, wire their jaws shut, blind them, cut off their legs or tails, or otherwise mutilate them and then release the unfortunate animals. Some public relations-minded stockmen insist that this kind of activity ended long ago, but their claims simply are not true.

I know a sheep rancher out here -- you wouldn't believe that guy! He's boasted about the coyotes he's trapped, how he takes a burlap bag, cuts out a hole for the head and two holes for the front legs, pulls the bags on the animals, pours kerosene on, sets them on fire and turns them loose. And he laughs when he tells that, as if it were the greatest thing!

--Dick Randall (Pacelle 1988)



In the early years, grazing industry and government were largely synonymous. Community, county, and state governments passed stock killer laws, supplied bounties, and generally helped kill predators whenever they could. Federal involvement began in 1890, leading to creation of USDA's Biological Survey. In 1907 private and government interests killed at least 1800 gray wolves and 18,000 coyotes. Federal, state, and county governments paid bounties for various varmints. Yet, in these early years, government activity was sporadic, minimally organized, and mostly undocumented.

Then in 1914 the Predatory Animal and Rodent Control become an autonomous part of the Biological Survey. In 1915, ostensibly compelled to maximize livestock production for World War I, organized federal involvement in predator "control" began in earnest when Congress appropriated $125,000 to be used by the Biological Survey for killing predators in Texas. Stockmen argued that since they were paying fees (10 cents/AUM in 1915) to graze federal land, the federal government ought to be responsible for protecting their livestock from predators (say what?). Soon the Western ranges were divided into supervised districts and federal, state, county, and private monies were used to coordinate the attack against the predator enemy.

For the benefit of the new men on the force I wish to state that we grade their catches in the following manner: One fox is worth 1/2 point, 1 coyote or 1 bobcat is 1 point, 1 bear is 10 points, 1 lion 15 points, 1 wolf is 15 points . . . . It is necessary to have 15 points or 1/2 point per day for the time you work in order to get on the honor roll . . . REMEMBER OUR SLOGAN, BRING THEM IN REGARDLESS OF HOW.

--M.E. Musgrave, Predatory Animal Inspector, 1923

In 1931 Congress enacted the Animal Damage Control Act, which authorized the Secretary of Agriculture to eradicate a host of "destructive" animals, including wolves (which by then had already been nearly eliminated from Western ranges), coyotes, bobcats, prairie dogs, gophers, ground squirrels, jackrabbits, and others. In 1939 this program was placed under the jurisdiction of the Department of the Interior. In 1986, under pressure from powerful ranchers, the federal government moved the Department of Animal Damage Control back to USDA, an agency more sympathetic to the ranching industry's desires.

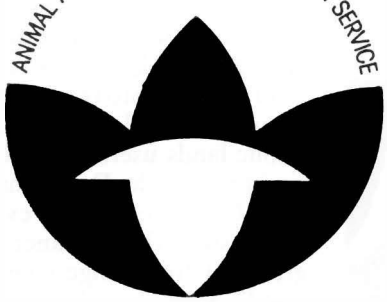
ADC kills everything from blueberry-eating geese to domestic cats "making noise in buildings," but according to ADC its principal mission is the protection of livestock. According to critics, ADC's principal mission is perpetuating its own bureaucracy by protecting livestock. This year, many of its 700 agents will trap, snare, den, poison, or shoot tens of thousands of predators, including coyotes, bobcats, foxes, black bears, and lions. The 1971 "Cain Report" sponsored by the Department of the Interior and Council on Environmental Quality stated that problems with the federal predator program stemmed in part from the fact that,

. . . . several hundred control agents today are the same persons for whom for many years the job requirements and measurement of an agent's success have been the killing of large numbers of predators and of personal, uncritical response to the complaints of stockmen. Agents are frequently long-time acquaintances, friends, and neighbors of the individuals demanding service.

ADC's 1990 Draft Environmental Impact Statement for long-term management of its Animal Damage Control Program is, according to Humane Society Vice President for

Wildlife John Grandy, "just awful in every respect": "All this document does is glorify the status quo. It's more of slaughter the West." Indeed, the EIS is so full of inaccuracies and distortions to promote ranching and its own interests that it is widely considered a bad joke. The Sierra Club's Atlantic Chapter concludes its blistering 39 page commentary with "this draft EIS is without redeeming value."

To minimize public scrutiny and opposition, ADC is extremely secretive. For example, throughout the United States ADC distributed only 1000 copies of the draft EIS mentioned above. ADC field agents do their killing quietly; its officials issue no public messages or information handouts; and its offices are purposefully located where they will receive little attention. Arizona's state ADC office, for example, is situated in an unmarked building in an obscure Phoenix small-business district; workers at a neighboring business didn't even know who occupied the office until years after ADC moved in. Understandably, few Americans have ever heard of ADC.



ADC logo on the cover of its 1989 report. Turn this book upside down, and the cow becomes a cowboy.

This mindless killing of coyotes, cougars, bears, and everything else that doesn't produce wool or beef on the public lands by the ADC is a sickening example of a government agency out of control. While this slaughter is presumably undertaken to protect the heavily subsidized stock industry, I suspect an equally compelling motive is the preservation of the jobs of the government's hired guns, the federal trappers.
--Jack T. Spence, Condon, MT, in a letter to the editor of *High Country News* (3-11-91)

Other federal agencies are, to a lesser degree, involved in murdering predators. Many states and counties also fund predator "control" programs. Western state game departments are especially sensitive to pressure from ranchers to fund predator kills. Some states still finance predator bounties, and counties are allowed to contract for the killing of wildlife to benefit stockmen. Some ranchers pay bounties or hire professional hunters and trappers to kill predators on private and public lands. And, because of the overwhelming influence of ranchers on early and subsequent Western state legislation, many hunting laws today are geared toward unrestrained slaughter of livestock predators, competitors, and pests. Predator bag limits in most states are set to keep predators at very low densities. (New Mexican laws still on the books, though not enforced, require hunters of certain game species to kill a wolf or mountain lion for each game animal they take!)

The verified government body counts are staggering but account for only a small fraction of the total kill. Moreover, according to a special report on the 4-11-90 *CBS Evening News*, ADC agents are routinely pressured to underestimate kills and to disregard non-target kills. And many government kills, especially poison kills, cannot be verified.

Stockmen have for decades waged their own extensive, intensive extermination programs; indeed, common knowledge on the Western range is that *stockmen and their hired hands kill far more predators than does the government* (documentation of this is, of course, essentially impossible). And by ranchers' own declaration, if ADC and other government predator programs were discontinued, ranchers would simply kill that many more predators themselves. Several wildlife experts have even suggested that many ostensible "predator kills" by ranchers are made instead more for personal possession or sale of pelts, stuffed heads, claws, teeth, bear fat, and such.

Sheepmen! I'm sick to death of them. They're a bunch of whining crybabies. Calling me up at all hours of the night, whining and crying for more traps, more poison, more attention. "Where's your husband? Why isn't he out here? Send him out here right away!"
--Wife of former federal predator "control" agent Dick Randall

Officially, sheep protection is the main justification for most predator "control" in much of the West. Yet, in many areas where predator "control" occurs, cattle are the animals being grazed. The foxes, bobcats, lynx, eagles, and others being killed are not even able to kill cattle, or usually even their calves.

Stockmen and their government agencies greatly exaggerate (often astronomically) the number of livestock killed by predators. Western public lands ranchers typically report yearly sheep and calf losses of 2%-5%, up to 10% and even higher (Ferguson 1983). Two House of Representatives reports in the 1960s and 1970s found these claims to be unfounded. Other studies show actual predator kills of usually under 1%. Sheepmen -- relatively speaking predators' worst enemy -- claim predator losses of $20-$25 million or more annually, while non-ranching sources consistently cite $4-$10 million (Ferguson 1983). According to Defenders of Wildlife, "Less than 550 of the 20,000 commercial sheep producers in the West -- less than 3% -- suffered about one third of the West's total lamb losses to coyotes (Defenders of Wildlife 1982)." Predictably, public lands sheep ranchers report far higher losses than private.

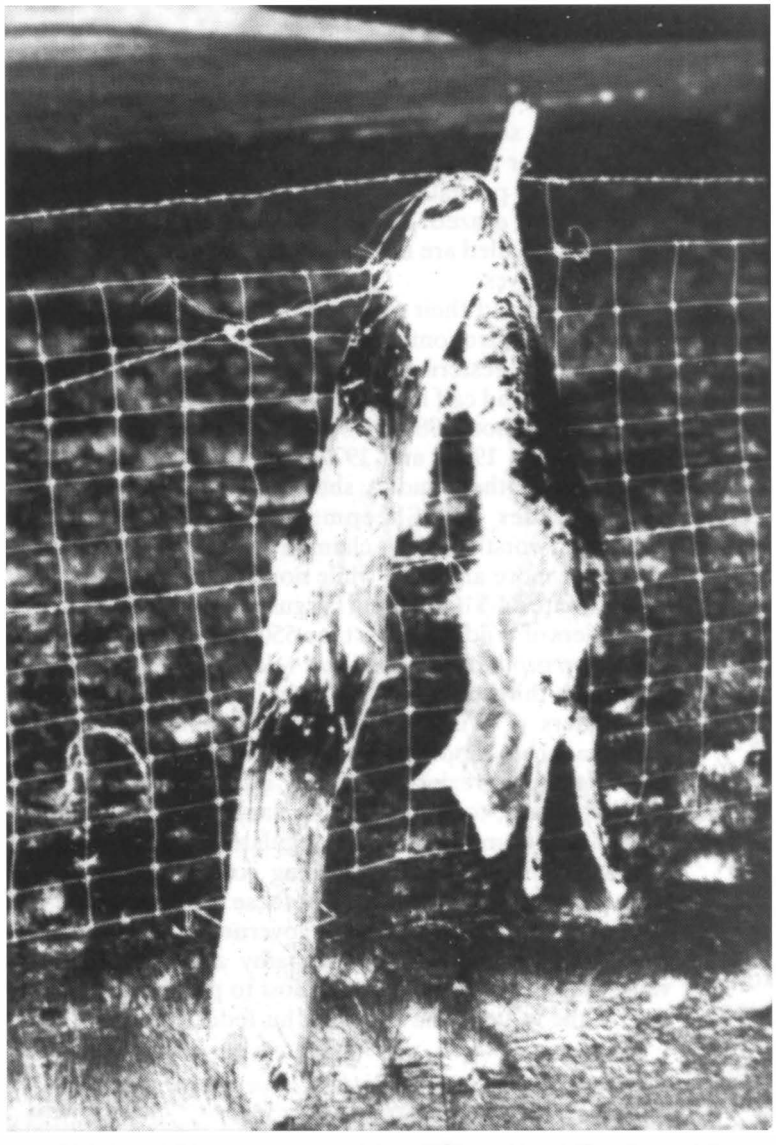
While most graziers habitually inflate predator losses, many ranchers, to cover up poor ranching practices or to make a bid for more subsidies, regularly blame *all* livestock losses on predators. The ranching community by mutual understanding quietly agrees that these "little white lies" are necessary to the continuation of government predator "control" programs and public sympathy and support. Conveniently, the owner of livestock lost to predation may also deduct the value of the loss from his federal income tax!

And I killed so many coyotes I got ashamed of myself. I think I got 700 and some coyotes in three months. Of course next spring, I didn't notice any difference in the amount of telephone calls I got. It was the same old whine, "The coyotes are putting us out of business, the coyotes are eating us up."
--Dick Randall

Furthermore, minimal correlation exists between predator "control" activities and reported losses to predators. Heavy losses have been reported consistently for a century, regardless of the intensity of predator programs. A recent National Audubon Society report states: "The Fish & Wildlife Service [under whose jurisdiction ADC was at the time] did not have the data which would justify the existence of its control programs, since it could not show the total amount of losses to coyote predation, the number of coyotes causing damage, or the relation of control methods to predator damage reduction."

Of course many ranchers, those of the Old West mode especially, don't bother with explanations or legalities. Here is a shocking but too-typical case in point, from the 8-11-88 *Tucson Citizen*: The article reports that southeastern Arizona public lands rancher Eddie Lackner *admitted* to killing 9 black bears *in one year* on the 2 National Forest allotments totalling 14,000 acres where he enjoys grazing privileges. According to an Arizona Game & Fish officer, "He didn't just shoot the bears, he let them die slowly in traps." The official said they probably died from thirst and exposure, their legs shredded by the jaws of the huge leg-hold devices. Lackner also admitted to killing 27 mountain lions since 1976, and word has it that he has also killed many other bears and mountain lions, bobcats, and any other predators or competitors he could trap or pump lead into.

According to the article, although Lackner could have been charged on 4 different counts, fined, and jailed, he instead was sentenced to 2 years probation by the Graham County prosecutor -- a distant relative who has hunted on "Lackner's" ranch. Even if convicted on all counts, Lackner's crimes would have been relatively minor infractions under existing laws. Arizona Fish & Game claimed it was unable to press charges. The Forest Service smacked Lackner's hand smartly by revoking 1 of his 2 grazing permits for 2 years -- the first time a grazing permit in Arizona has been suspended for such reasons. Many of the cattle from this allotment were moved to adjoining state grazing land. Also, at Lackner's request the Forest Service road leading onto the allotment where the offenses occurred was closed with a fence, meaning other public lands users must obtain Lackner's permission to enter the Forest through Lackner's private land. On top of all this, even Forest Service documents show that Lackner's allotments were overgrazed. Forest range chief Larry Allen concedes that FS might have been "a little too accommodating toward the livestock interests." But that's not all. Since the Lackner case was filed, Game and Fish documents reveal that 2 more bears and at least 25 more (and still counting) mountain lions have been killed by Lackner and federal predator agents on "his" allotments .



Stockmen use this repulsive form of voodooism to take out frustrations and to induce surviving predators to leave the area or meet the same fate. Where they are to go is a mystery when nearly every suitable habitat is occupied by livestock (or other predators). *(Unknown)*

The huge, 16" jaw, 2" teeth, steel leg-hold traps Lackner used to kill the animals would have been illegal if used by anyone but a rancher. Only in stock killing cases is such a large trap legal. Arizona Fish & Game officer Dave West stated, "If a person got caught in it they would never have been able to get out."

Non-ranchers are required by law to check their traps daily. Ranchers face no such requirements. According to an agent of the Arizona Game & Fish Department, "Ranchers who use this technique drop by their traps about once a month and kick aside the desiccated remains of whatever bear or mountain lion [or non-target animal] that has died there. Then they reset their trap and go about their business."

As a stockman, Lackner has legal rights far beyond those of mere mortals. As with other Western states, Arizona has special statutes allowing ranchers to kill actual, suspected, or even *possible* predators in many different ways legal only to them. No proof of actual or intended predation is required. Ranchers can kill as many predators as they like, anywhere, at any time of the year. They don't have to pay a fee, use legally established hunting methods, or report their kills for most species, as all other people are required to do. (Under Arizona and some other state laws,

ranchers are required to report all bear and lion kills, but it is well-known that few do.) Only a rancher can kill as many mountain lions as he wants. Only a rancher can legally kill any animal on public land he dislikes.

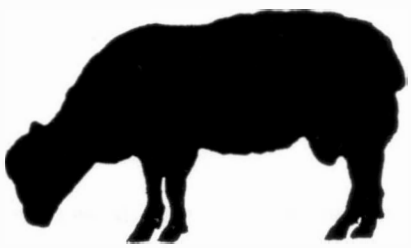
Of the few wildlife protection laws that do apply to ranchers, few government officials are inclined to interpret these laws so as to incriminate stockmen. However, even if laws were passed to strictly forbid ranchers to kill any predator, it is widely acknowledged -- boastfully by stockmen themselves -- that most predator slaughter would continue unabated.

> *Idaho's* [and any Western state's] *agrarian history has left us with an institutionalized kneejerk reaction when it comes to predators: In any encounter with domestic livestock, the predator must lose. It is a reaction that deserves some reassessment.*
>
> --Pam Morris, managing editor of *Idaho Mountain Express*, in *High Country News* (10-15-87)

> *Ranchers with chronic problems from predators on public lands must change their grazing practices. Cow-calf operations should be discontinued in brushy, rugged areas of public land that are in prime lion and bear habitat. Such allotments should either be restricted to steers, which are less prone to attack by lions and bears, or be retired in favor of wildlife.*
>
> --David Brown, wildlife biologist, author, and former chief of game for Arizona Game & Fish Department (Brown 1985)

A rancher beheaded and skinned this bobcat. *(Steve Johnson)*

"Predator control" has in reality been a ruthless campaign of genocide against many animal species. As a result, *most* large predators have been extirpated from much or most of their former ranges, and some are on the Endangered Species list. Following are species-by-species descriptions of the ranching establishment's continuing offensive against its major "varmint" enemies.



•Grizzly bear

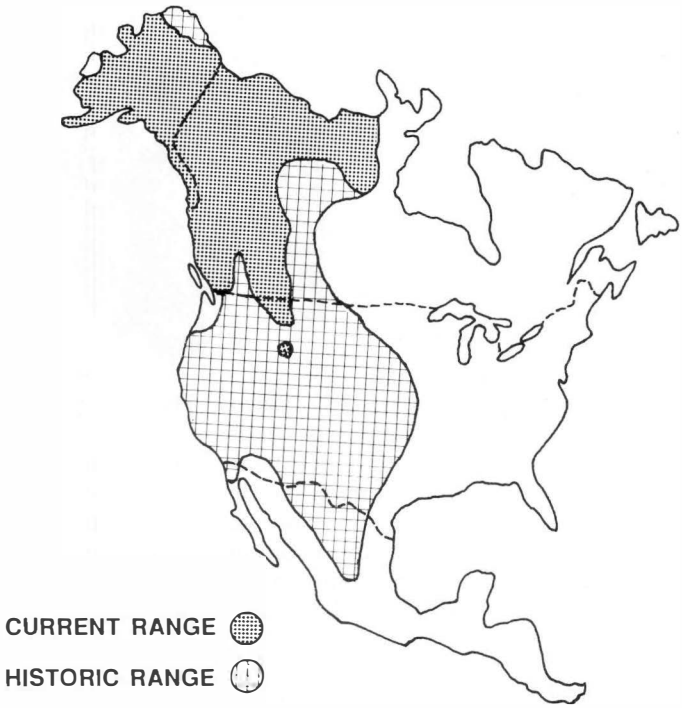
Excepting the polar and Kodiak bears, the world's largest and strongest terrestrial predator is the grizzly bear, *Ursus horribilis*, a magnificent and much misunderstood animal. Like Kodiaks, grizzlies generally are recognized as a subspecies of brown bear, *Ursus arctos*. There is much disagreement on classification of varieties.

Grizzlies resemble their black bear cousins, but are larger, with a prominent hump in the shoulder and longer, straighter claws. Fur commonly is brown with silver-tipped hairs, but grizzlies vary greatly in coloration and other features. Adult grizzlies in the continental US typically weigh 300 to 600 pounds, occasionally 800 pounds or more. Most stand 3'-5' high at the shoulder and about 6'-7' end to end. Males generally are much larger than females.

The Great Bear can run more than 40 miles per hour, live to 30 years of age in the wild, and is so powerful it can crush a hereford's skull like an eggshell. Grizzlies are very broadly territorial and range widely, as individuals, or in families or small groups of families. They require large areas with a variety of terrain and food sources.

Grizzlies are gatherer-hunters and will in fact eat practically anything that lives or once did. They kill and eat many kinds of animals, but studies show that *70%-80%* of their diet in the Lower 48 consists of *plant* foods, often grass and sedges. (However, their diet probably has become more plant-centered since the most predatory bears were killed off over the years.) Their most significant nutritional component is plant protein. Grizzlies generally dislike human flesh and usually keep their distance from people. Nonetheless, more than any Western carnivore they do kill and sometimes eat humans, though so rarely that there is a greater risk of being killed by a falling tree. Their few attacks on people almost invariably occur when the bears are cornered, provoked, wounded, or when protecting young (especially), bedding sites, or food. Humans are the grizzly's only enemy.

A grizzly bear eating berries. *(George Wuerthner)*



HISTORIC AND CURRENT DISTRIBUTION OF THE GRIZZLY BEAR IN NORTH AMERICA

(Source: Peacock 1988)

Because the grizzly needs a large, pristine, and diverse habitat, his continued existence guarantees survival of many forms of life. He is a measure of the health of the whole system.
--Annick Smith, from *Great Bear*

When Europeans arrived on this continent, a conservatively estimated 100,000 grizzly bears roamed plains, plateaus, valleys, mesas, hills, and mountains of the West. The explorers Lewis and Clark in their 1804-1806 journey reported sighting grizzly and black bears most days and killing at least a few of them almost every week (Thwaites 1959). Seventeenth century Spaniards in California occasionally reported seeing 50 or 60 grizzlies in one day, many of them feeding in actual herds (McNamee 1985). Grizzly range encompassed the entire western half of what is now the United States, excepting arid regions and the wettest portion of the Pacific Northwest. Unlike today, pre-European grizzlies lived an open and sunny existence, roaming freely across the landscape -- grasslands, low-elevation woods, and riparian zones (even within deserts) included.

There was no attempt to isolate the livestock killers; all grizzlies were sheep and cattle killers to the stockman and therefore they were executed whenever and wherever they were encountered.
--J.J. McCoy, **Wild Enemies** (McCoy 1974)

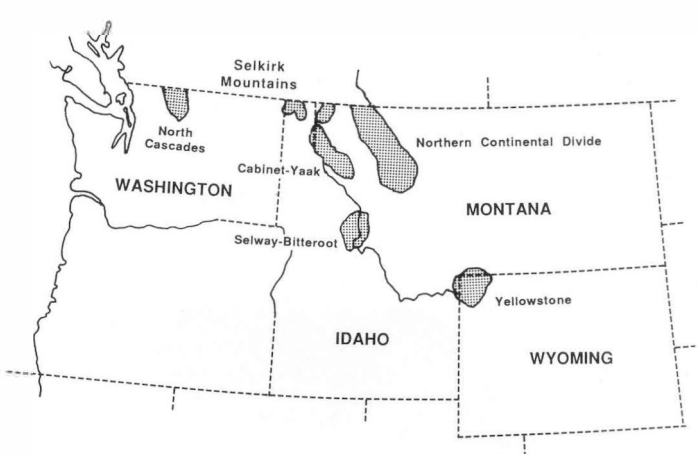
The griz fell victim to the standard livestock scenario: as ranchers took over most of the West in the mid-1800s, they killed as many grizzlies as they could. Their livestock so overgrazed the grizzly's habitat that its food source of grass, forbs, leaves, berries, fruits, nuts, roots, tubers, insects, and grubs was seriously depleted. Range management and overgrazing's secondary effects drastically reduced the number and variety of prey animals, and riparian and waterway damage lowered fish populations. In a twist of irony, surviving grizzlies sometimes of necessity took to eating the livestock that had ravaged their habitat. David Brown relates in **The Grizzly in the Southwest**, "Like the wolf, the opportunistic grizzly was not about to forego a new and readily available food source -- not when this new-found prey had depleted the grizzly's natural food supplies (Brown 1985)."

Nevertheless, the grizzly never was the rabid livestock killer portrayed. Grizzly expert Doug Peacock writes:

Protecting livestock was ostensibly the principal reason for killing grizzlies. Yet few bears actually preyed on domestic animals. Bears were shot due to ignorance, irrational hatred, and the illusions of what constituted duty or sport. (Peacock 1988)

Early explorers, trappers, and settlers across the West shot all grizzlies they encountered as a service to stockmen and to general human advancement. Some used dynamite. In California, many early ranchers made sport and money by staging grizzly/bull fights. The bears usually won, but ranchers provided them a never-ending supply of bulls. (McNamee 1985) By the end of the 1800s, grizzlies were extirpated from much of the West.

With grizzlies on the run in the early 1900s, livestock interests stepped up the slaughter. The plains grizzly, a variety that once preyed on bison and pronghorn but was forced to prey on livestock, was driven to extinction. The federal government trapped, shot, and poisoned remaining grizzlies without restraint. Stockmen shot them on sight or paid bounties. According to Lance Olsen, Director of the Great Bear Foundation in Missoula, Montana, "By the 1920s, grizzlies survived only in remote and rugged mountains where the livestock industry had not yet penetrated." As with so many Western species, the grizzly was forced to change its habits and confine itself to inhospitable areas rarely visited by humans or their livestock. In Mexico, griz held out in small numbers in the northern Sierra Madre until the 1960s when ranchers launched a final assault with guns, traps, and poisons.



OCCUPIED GRIZZLY BEAR ECOSYSTEMS IN THE LOWER 48 STATES

(Source: Peacock 1988)

In the US West today 99% -- *including the best* -- of the grizzly's former habitat is no longer home to these awesome omnivores. In California, whose state flag features the grizzly, a grizzly population of about 20,000 -- possibly the second highest brown bear concentration in the world -- was reduced to zero. In the 48 contiguous states probably less than 800 grizzlies survive in 6 relatively small enclaves at high elevations in the northern Rocky Mountains, mostly in Wilderness Areas and National Parks. Only 2 of these enclaves harbor enough grizzlies to be considered sufficient for genetically viable, self-sustaining populations -- the Northern Continental Divide and the Greater Yellowstone Ecosystems (including Glacier and Yellowstone National Parks). Nearly all surviving grizzlies live on public land. (Brown 1985, McNamee 1985, Peacock 1988)

Unfortunately, livestock, sheep especially, are grazed in or near most of these rugged, remote areas. And grizzlies occasionally do eat a dozen sheep or a few cows. As one grizzly expert put it, "These docile, defenseless flocks of sheep must to a grizzly seem like some benevolent soul has set the table." Nonetheless, depredation has been exaggerated by ranchers, who aim to make sure grizzlies are not allowed to make a comeback.

Systematic extermination of grizzlies continued into the 1970s. Since then, many "problem" grizzlies have been killed by government officials, while poachers, slob hunters, and general development in their range have taken a heavy toll. But conflict and slaughter in or near these high elevation sheep allotments probably continues as the major single factor working against their survival.

Records show that in the second largest grizzly population in the Lower 48, the Greater Yellowstone Ecosystem, 20 grizzlies were killed on sheep allotments between 1970 and 1975. Curiously, since 1975, when grizzlies were officially classified as a Threatened species, there have been no grizzly killings reported on Yellowstone-area sheep ranges. Why? Because grizzly killers are now subject to fines and official investigations. Now the rule, even more than before, is "shoot, shovel, and shut up."

For example: In 1978 in the Targee National Forest portion of the Greater Yellowstone Ecosystem there were 2 known grizzly killings by sheepherders. In a 1980 report to the Wyoming Department of Game & Fish, biologist Larry Roop stated,

> *One of these was discovered only because it was a radio-collared bear. The other was discovered by a researcher in a sheepherder's camp. Because of the discovery the researcher was threatened and was unable to collect the skull for study. . . . There were four more Grizzly Bear mortalities strongly suspected, but not confirmed, in the Targee National Forest during 1979. All of these losses were associated with sheep grazing.*

A 1979 report by the Yellowstone Interagency Grizzly Bear Study Team stated that "Information gathered by undercover agents and volunteered by sheepherders indicated that at least three other grizzlies and possibly as many as *fourteen* have been killed in the last two years . . . ."

A 1988 report prepared by the Greater Yellowstone Coalition states that since 1975, 20% of all known and probable grizzly mortalities resulted from conflicts between bears and livestock. The report also noted that livestock may eliminate or reduce the plants grizzlies need for food, leading indirectly to increased mortality, either through starvation or by forcing the bears to forage more widely, bringing them into contact with people. Forty-four percent of the Greater Yellowstone Ecosystem is open to livestock grazing.

The situation is even worse in the largest grizzly enclave, the Northern Continental Divide Ecosystem in Montana, where 31 of 35 reported "grizzly bear control actions" between 1967 and 1983 were related to sheep depredations. Further, biologists agree that there is *at least* 1 unknown death for every known kill. (Dogmeat 1986)

> *The* [cattle-eating grizzly] *was captured, tranquilized, fitted with a radio-transmitting collar, and transported far from Choteau* [Montana] *to the western side of the Continental Divide. Within days the bear was back, killing cattle again, and this time was killed in a state-sanctioned hunt. Ranchers tend to think that predatory animals caught in the act of killing livestock should receive no second chances.*
>
> --Henry Schacht, Farm Reporter, 10-23-87 *San Francisco Chronicle*

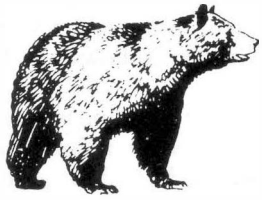
Not only does the ranching industry bear (so to speak) more responsibility than anyone else for grizzly extermination, but also for subsequent failure to reintroduce the bruin. There are biologically excellent reintroduction sites for the grizzly in every Western state, except perhaps Nevada. Yet, even with the promise of guaranteed compensation for livestock losses, the industry refuses to reconsider its opposition. Thus, despite legal mandates, no Western state plans to reintroduce the animal. The grizzly's needs, the public's desire, environmental integrity -- all take a back seat with the Imperial Graziers at the wheel.

(Brush Wolf)

The heedless [grizzly] *bear that roamed the open and fed by day is gone. His place is taken by bears that feed secretly, silently, by night, in cover -- always secretly.... He has retreated to secluded fastnesses, to wild and inaccessible regions of thicket and mountainside. He is changed in temper as in life, and the faintest whiff of man scent is now enough to drive him miles away.*

--Naturalist Ernest Thomas Seton

•Black bear



The black bear is the most numerous and widely distributed bear in North America and has been a resident of the continent for about 500,000 years. Though similar in appearance to the grizzly, this bear is generally smaller and darker, with shorter, more curved claws, a straighter nose, larger ears, a small white patch on the chest, and no shoulder hump. As with grizzlies and humans, appearance and behavior between individuals vary greatly.

Adult black bears generally weigh from 150 to 450 pounds, measure 2'-3' at the shoulder and about 5' long. Females usually are smaller than males. Their fur is black or dark brown, occasionally cinnamon, or even blonde. Like grizzlies, black bears have poor eyesight, good hearing, a keen sense of smell, great intelligence, and are easily irritated. They are fine runners, swimmers, and, unlike the straighter-clawed grizzlies, adept tree climbers. Black bears are more territorial than grizzlies, but loosely so, also wandering great distances in search of food, singly or mother and cubs together.

Like the grizzly, the black bear has flat molars and sharp front teeth; its herbivorous/omnivorous diet includes berries, acorns, grasses, leaves, cactus fruits, bulbs, bark, roots, honey, bird eggs, grasshoppers, ants, termites, grubs, fish, small mammals, an occasional larger animal, and carrion. In some areas frequented by tourists, black bears eat tourist treats and garbage. Though even less dangerous to people than grizzlies, they are much more numerous and likely to make contact with humans.

Like most Western predators, black bears are opportunistic scavengers. Most bears readily eat from cattle and sheep carcasses. Though probably most eat livestock as carrion only, they are from circumstantial evidence, or simply on principle, declared stock killers and relentlessly hunted and killed. Others, by eating livestock carrion, acquire a taste and begin killing livestock for food, whereafter they are pursued unto death. Those few black bears that kill livestock regularly do so because they are driven to by an overgrazed habitat or presented an almost irresistible offering of unprotected mutton or beef for their dining pleasure. Most never set teeth on livestock, but they too are often pursued and killed, simply because they are bears. And, many are killed by traps and poisons as non-target species.

Early Western settlers often could not tell if they were killing black or grizzly bears, but to them it did not matter. With help from government predator "control" in the early 1900s, black bears were killed so indiscriminately that in 1919 even a chief federal predator "control" agent, J. Stokley Ligon, reported, "Few of the black and brown bears are really destructive to livestock, most ranchmen are so unfair as to condemn all the animals for the crimes of a few." By the late 1920s both black and grizzly bears had been so reduced in numbers and range that Ligon reported, "Poverty stricken ranges, as a result of excessive range utilization, and drought often render their usual food so scanty that out of need bears become killers; hence, as respects losses from bears, forage conservation would result in increased savings of cattle and sheep." (Brown 1985)

Until the 1920s black bear decline in the West generally paralleled that of the grizzly, but after, the grizzly gradually slid toward oblivion, while the black bear partially recovered. One reason is that predator "controllers" began focusing more attention on the grizzly. More importantly, loss of the grizzly's open habitat to ranching and settlement made it impossible for the animal's low reproductive rate to recoup relentless attrition from stockmen and their bear-hunting allies. The black bear, on the other hand, needing a smaller home range and naturally more a creature of the forest, was more resilient.

Since the early 1920s black bears have expanded their populations and territories, though not nearly to their original numbers or range. Although they live in mountainous and forested areas in every Western state, black bears have been extirpated completely from numerous mountain ranges, and where they do survive they do so in much smaller numbers. Increasing evidence indicates that in recent years their numbers are once again declining. In the West, their most deadly enemy is still ranching. In 1988 ADC alone *reported* killing 289 black bears, while perhaps thousands were killed through other government predator programs and, mostly, by stockmen themselves. Each year, thousands more are precluded from existence due to a degraded range and ranching developments.

Like the grizzly, the black bear has necessarily changed its habits and habitat since Europeans and their livestock arrived in the West. As opposed to pristine times when it roamed freely between vegetation zones in diverse terrain, the black bear now stays almost exclusively in or near the protective cover of thickly forested areas; it is secretive, primarily nocturnal, and seldom seen, except as a camp robber or garbage eater.

•Wolf

The wolf was this continent's premier, most ubiquitous predator, inhabiting nearly every terrestrial ecosystem before the arrival of Europeans. Two species are native to North America. The red wolf, *Canus niger*, is a small wolf somewhat resembling a coyote. Once found throughout the "Civil War South," it was extirpated from its range entirely and survives today only in captivity and as several small reintroduced populations at the Alligator National Wildlife Refuge in coastal North Carolina and Cape Romain National Wildlife Refuge in coastal South Carolina. Another reintroduction proposal for Tennessee-Kentucky was scrapped when both state wildlife agencies withdrew their support because of objections from livestock interests, while the current reintroductions are saddled with many restrictions due to stockmen. No red wolf reintroduction site is

large enough to maintain genetically healthy populations, but they are a beginning.

Many varieties of gray wolf, *Canus lupus*, once inhabited all but the driest portions of the West and, curiously (at least according to most experts), most of California. Many subspecies are now extinct. The gray wolf looks something like a large German shepherd, weighs usually from 50 to 120 pounds, and measures 2'-3' tall and about 4' long in head and body. Depending mostly on environment, gray wolves may vary in color, from pure black or white to the usual gray to brown, gold, or tan.

Wolves are highly social animals, and their social structure is complex. Their packs usually consist of a couple and their young, along with some close relatives, numbering up to 15 or so. Packs larger than this are less efficient, so wolves regulate pack size carefully. The Mexican variety of wolf (*C.l. baileyi* -- named, ironically, after an early wolf eradicator), the most distinct North American subspecies, lives in smaller groups of up to 6. The famous "lone wolves," of which there are comparatively few, are mostly younger wolves that were driven away from oversized packs. They live alone without social territories until accepted into another pack or until they join other lone wolves. In natural situations, wolves usually mate for life; if one of a couple dies, the other usually never mates again. Their average yearly litter is 6 pups. They are prolific reproducers, if not disturbed by humans and if food is adequate.

Wolves are very playful and affectionate, and genuinely enjoy and appreciate each other. They are highly intelligent, much more so than domestic dogs. Their only real enemies are humans, and rarely bears.

Gray wolves travel widely in search of food, and may cover 30-125 miles in a day. A pack's well-defined but dynamic territory may be anywhere from 50 to 5000 or more square miles, depending on numerous environmental variables. Hunting is done in packs in a very organized, cooperative fashion, usually not by outrunning but by circling and wearing down their prey. Much more carnivorous than coyotes, wolves feed only rarely on wild berries, fruits, grass, or other plant foods. Gray wolves favor deer, elk, pronghorn, buffalo, moose, and other large mammals, but will eat small mammals and rodents, reptiles, amphibians, birds, fish, and even insects and earthworms. They much prefer to kill their own food, but will eat carrion if they must. A wolf can eat 20 pounds of meat at one feeding.

Wolves have been around the West in one form or another for an estimated 15 million years. (Before the Pleistocene extinctions, dire wolves also roamed the continent.) Before Europeans and their livestock arrived, gray wolves ranged over prairie, mesa, valley, and mountain alike. The Lewis and Clark expedition of 1804-1806 reported numerous wolves along most of its route across the northern West. Like grizzlies, wolves are top-level predators and their influence on Western ecosystems was profound.

> *The Indians understood it all along. They would watch attentively as early settlers sought to render wolfless the surrounding countryside by pumping dead cows full of poison and setting them out in their fields. Such behavior amazed Native Americans. Their explanation for it was that, among palefaces, it was a manifestation of insanity.*
>
> --Ted Williams, "Beast of Lore" (Williams 1988)

For more than 1000 years, the wolf has been the most misunderstood of all predators. While Native Americans knew and did not fear the wolf, the "great" cultures of Europe turned it into a symbol of the Devil -- largely because of centuries of predation on European livestock. Thus, the Europeans who arrived on this continent in the 1500s brought with them an intense fear of wolves, cultivated by centuries of horror stories by superstitious, religious peoples who had lost connection with the natural world. These early settlers were terrified by wolves howling around them at night -- wolves that killed and ate their livestock and left bloody bones for them to find! Rumors of wolves attacking people ran rampant, and the settlers' fear bordered on hysteria. The wolf was considered an especially evil enemy, to be unquestioningly destroyed. (In Virginia, settlers began converting the natives by offering them one cow for every wolf destroyed.) Descendents of these American colonists brought this unreasonable fear of the wolf with them when they "settled" the West in the 1800s. Passed down through the generations, it persists even today.

There never was any real basis for this paranoia. In all of North America there has never been a documented case of a healthy, wild pure wolf killing a human. Jim Johnson of the Endangered Species branch of FWS says that "people hiking in the woods are more likely to be eaten by a cow than a wolf." Fact is, wolves immediately flee at the slightest sign of humans. Even when people threaten their home or young, they keep their distance. Indeed, researchers have carried off their pups while the parents followed for miles, whining all the while. Except toward prey, wolves are extremely shy and gentle animals.

> *The livestock industry has been united to have the wolf forever removed from its domain. Powerful political forces were mustered to enlist the aid of the U.S. government in the total removal of the premier livestock predator from Western rangelands and to insure that no reservoir of breeding wolves remained for reinfestation. No refuge for wolves was to be permitted.*
>
> --David E. Brown, **The Wolf in the Southwest** (Brown 1984)

Wolves can easily kill a sheep or calf, and are quite capable of bringing down an adult cow; however, they prefer full-grown sheep and yearling cattle. In the late 1800s, with their natural prey severely reduced by overgrazing and overhunting (largely by ranchers), wolves came to rely on livestock for food. In fact, the intensity of wolf predation on livestock coincided perfectly with the overgrazing of their habitat -- not so much because livestock numbers were high as because wild prey was scarce. The omnipresent herds of docile, practically defenseless animals (the tough Texas longorn partially excepted) afforded wolves an endless supply of easy prey on an otherwise nearly empty hunting ground.

By taking livestock from grossly overstocked ranges, wolves were in a sense merely culling surplus animals. And, though wolves generally prey on weak and inferior animals, to them *all* livestock must have seemed weak and inferior. As naturalist Ted Williams writes, "As wolves view the universe, the torpid, dull-witted creatures we call 'livestock' qualify eminently as 'infirm'" (Williams 1988).

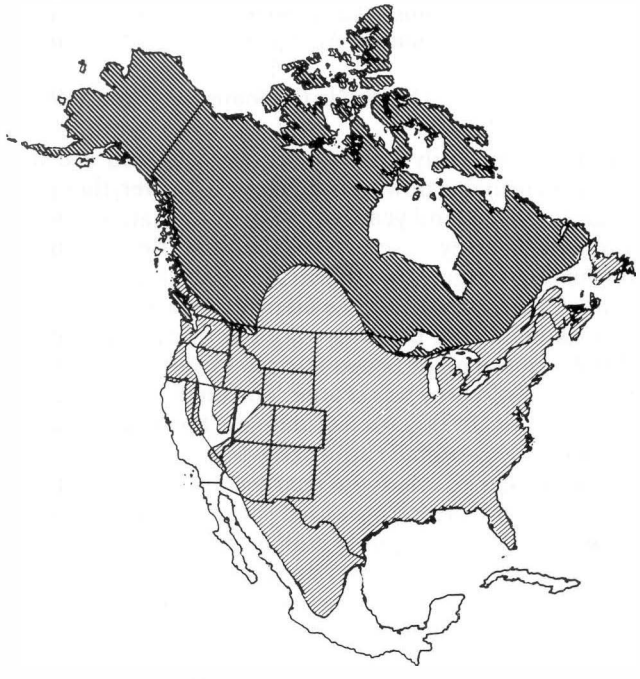
Wolves surely did kill a large number of stock, but ranchers grossly overestimated losses. Wolves found

scavenging livestock remains were routinely blamed for those deaths, though the animals often had died from other causes. Wolf prints around a sheep carcass were more than enough reason to kill every wolf in an area. And as always, stockmen greatly exaggerated predations to elicit sympathy and support from the public and government. Eventually *all* wolves were condemned as stock killers.

And so stockmen's fear turned to hate. The slaughter intensified, with guns, snares, traps, and animal carcasses poisoned or laced with broken glass (which causes one of the most excruciatingly painful deaths imaginable). By the 1880s ranchers and government were paying wolf bounties. For example, in 1883 Montana's first state-sponsored wolf bounty brought in 5450 dead wolves for the $1 bounty. By 1905 the Montana state legislature had increased the bounty to $10 and ordered the state veterinarian to inoculate all trapped wolves with scarcoptic mange and release them into the wild. Between 1883 and 1918, 80,730 wolves were bountied in Montana, while many thousands more were killed without bounty. The story was similar in every Western state, and within a few decades the Western wolf population was cut in half.

However, wolves are wary and intelligent animals with high reproductive potential. They were not to be so easily eradicated from the West. Early wolves were vulnerable due to their pack structure, territorialism, and repeated use of wolf pathways, and they accepted a wide variety of baits and blundered into the most obvious traps. But they learned quickly, and the last wolves in this country died hard. Some became experts at uncovering traps and taking bait; some learned to avoid poisoned bait; the survivors changed their habits and avoided humans unequivocally.

WOLF DISTRIBUTION



Eventually, the Great Provider -- Uncle Sam -- was called into the genocide campaign. "Sportsman" President Teddy Roosevelt damned the wolf as "the beast of waste and desolation," and in 1915 the federal government passed a law requiring extermination of all wolves on federal lands, including National Parks. Soon, skilled, well-equipped federal predator "control" agents spread across the land. By the 1940s wolves survived only as scattered individuals and a few small groups; in the 1950s and 1960s only a few rugged scragglers remained; and from the 1970s on wolves were reported only as occasional wanderers from Canada and Mexico.

Thus did the ranching establishment almost single-handedly exterminate the gray wolf from the American West. As an idea of the size of this war, in all more than $100 million (perhaps $0.5 billion in today's dollar) in wolf bounties has been paid in the US and Canada since the early years. Bounties are still paid in a few areas. As a sadly humorous example, in 1986 the Brazos County, Texas, treasurer paid out $225 for 30 sets of "wolf" ears under the county's ancient predator laws. The ears were probably those of dogs or coyotes. The treasurer was informed that there haven't been wolves in the area for decades, and county officials subsequently voted to stop paying the $7.50 bounties. Today, stockmen in Alberta and British Columbia, along with the hunting establishment, continue to kill Canadian wolves, sometimes with bounties, while in Mexico ranchers and population pressures have nearly driven the gray wolf to extinction.

> *We're going to fight this to the bitter end. We're just not going to have wolves.*
>
> --Joe Helle, National Wool Growers Association, sheep rancher

In the past few decades, the occasional wolves crossing the borders from Canada and Mexico into the US have excited the fears of stockmen and the imaginations of wolf advocates. Thus far, the public's growing demand for wolf reintroduction has been consistently overpowered by ranchers' vehement insistence that wolves shall never again roam the West. Wolf recovery efforts have been thwarted on 3 main fronts: the Southwest, northern Rockies, and Yellowstone National Park. (Additionally, a reintroduction proposal for Olympic National Park -- a prime site -- was recently defeated by area stockmen.)

> *Keep them* [all Mexican wolves in the US] *in the zoos. They're not smart enough to survive . . . that's why they didn't survive before.*
>
> --Gerald Maestas, New Mexico State Game Commission chairman, 1-29-88 *Albuquerque Journal*

The last few wolves in New Mexico were killed for ranchers by a federal agent in the late 1960s. In Arizona, the famous Aravaipa Wolf was taken "quietly" (so as not to arouse public displeasure) in 1970 by a private trapper for a reputed bounty of $500 put up by local stockmen. Ironically, even before this time, with growing support from the public, the US Fish & Wildlife Service -- the same agency largely responsible for exterminating the wolf, now entrusted with its recovery -- had been considering wolf reintroduction plans for the Southwest.

Under the federal Endangered Species Act of 1973, the Mexican subspecies of gray wolf was in 1976 determined to be in extreme danger of extinction and listed as Endangered, mandating the federal government to take whatever steps necessary to save it. The Mexican Wolf Recovery Team was established in 1979. In 1982 the team wrote a reintroduction plan that was approved by the US and Mexican governments and drawn up by the Recovery Team. Under the plan, only a token number of wolves would be reintroduced in 1 or a few locales. Each locale would be, according to project director Norma Ames, at minimum "a 200 square mile piece of public land with as little impact by livestock or humans as possible." Each wolf would be fitted with a radio collar for tracking purposes, and each collar would contain a radio-activated tranquilizer dart so wolves could be immediately subdued if they wandered onto land used by livestock. Reintroduction was tentatively scheduled for the late 1980s or early 1990s.

Originally, New Mexico, Arizona, and Texas were considered for reintroduction. But in 1986, with complete disregard for the Endangered Species Act, ranchers forced a bill through the Texas legislature which made re-introduction of wolves in that state illegal. In 1987 FWS asked New Mexico and Arizona to consider possible reintroduction sites in those states.

New Mexico proposed the wild, remote Animas Mountains in the extreme southwestern part of the state (excellent wolf habitat) and the Air Force's White Sands Missile Range (not great wolf habitat, but also not grazed by livestock, therefore having the least potential opposition). The New Mexico Cattle Growers Association (NMCGA) reacted by threatening to have all state game personnel supportive of the plan fired. Shortly thereafter, the Animas Mountains were dropped from consideration, and the commander of the White Sands Missile Base alleged that the Air Force could not support the plan because it did not want wolf biologists on the Missile Range because they might get hurt. (Interestingly, on this same range have been a 10 year mountain lion study, a public sport hunting season on introduced oryx and ibex, researchers studying a protected herd of bighorn sheep, and other human activities.) Meanwhile, New Mexico's best reintroduction site, the huge Gila/Blue Range Wilderness complex in the southwest, was not seriously considered due to ranchers' clout in that area.

With pro-ranching politics-as-usual, wolf reintroduction in New Mexico is unlikely. Indeed, in 1986 Governor Gary Carruthers (a close friend of James Watt and long-time public lands ranching supporter) appointed a past president of the NMCGA to head the New Mexico Game Commission. Of the reintroduction effort, current NMCGA president Denny Gentry stated "We've put [federal and state officials] on notice that we will take whatever legal action and political action is necessary to stop it." Gentry further promised that ranchers would "shoot the damn things as fast as they're released."

The fact that efforts to reintroduce the gray wolf into Arizona wilderness are being squashed by the Arizona Game & Fish Director is an indication of the choke-hold welfare ranchers have on our public lands.

--John Patterson, teacher and environmentalist, in letter to the Arizona Game & Fish Department

Over in Arizona, things were little different. The state Game and Fish Director agreed to evaluate no less than 15 potential reintroduction sites. However, though many of the sites were physically adequate for wolves, a new Game and Fish director soon thereafter bowed to industry pressure, saying he had to "put the plan on the back burner" for alleged "lack of public education" on the wolf. In a telephone interview, a Game and Fish official described the department's 3-point reintroduction plan as (1) breeding, (2) identifying reintroduction sites, and (3) educating the public. Consequently, it may be 10 years or more before wolves are "on the ground" in Arizona, if ever. Yes, he said (covertly), stockmen are chiefly responsible, but we "must accept reality."

In October 1987, with Texas, New Mexico, and Arizona all refusing to cooperate, the FWS Region 2 Director in Albuquerque announced: "We have no sites. The [Mexican] wolf reintroduction program is now terminated." Many people feel FWS never was serious about reintroducing the Mexican wolf into the Southwest and was just going through the motions to appease the public and to superficially acknowledge the Endangered Species Act. Whatever the case, Southwestern stockmen have crushed the program, as they promised they would.

Presently, there are only 38 Mexican wolves in captivity, 30 of which are in the US. Few have been bred because there aren't more pens to hold their progeny. With each passing year they lose more of the wildness they need to survive as a natural species. They live in cages and eat dog food.

The Southwest has changed drastically since wolves were a functioning part of the ecosystems of the region. If those changes are too drastic, then the restoration of the Mexican wolf in the wild is no longer a reasonable possibility in this region.

--Bill Montoya, Director, New Mexico Department of Game & Fish

Opposition to recovery for the gray wolf also has been vehement in the Rockies. Strongly influenced by the ranching industry, most state officials there have expressed outright hostility to any reintroduction effort. The Colorado Game and Fish Commission approved a resolution opposing "every person or entity" that would even suggest returning the wolf to the state, (Brown 1988) as did the Idaho Game & Fish recently.

Even so, the northern gray wolf has a much better chance of reinhabiting lost habitat than does the Mexican wolf of the Southwest. Wolves naturally were much more numerous in well-watered regions, where their prey base of large ungulates was more abundant. (Between 1880 and 1920, the grazing industry killed more than 100,000 wolves in the northern Rockies alone.) There remain vast, comparatively wild spaces of suitable habitat in the northern Rockies, especially in central Idaho, which contains the largest block of Wilderness in the lower 48. And the Canadian wolf population is still large enough to spin off occasional individuals and packs into the remote mountains of Montana, Idaho, and Washington (where 2 wolf dens were discovered recently).

Public support for the wolf in the northern Rockies has grown strong in recent years, and tentative recovery plans

were gradually developed. In August 1987, compelled by the Endangered Species Act, FWS Regional Deputy Director John Spinks signed a wolf recovery plan that called for establishing 10 wolf packs each in northwest Montana and north-central Idaho, and reintroduction to Yellowstone National Park. Just a month later, under pressure from stockmen, FWS Director Frank Dunkle (former chairman of the Montana Republican party), announced he was shelving the plan as "foolhardy." Said Joe Helle of the National Sheep Growers Association, "We got it stopped. We still have the political clout . . . ."

Nonetheless, Yellowstone National Park, from which wolves were extirpated in 1926, remains prime for wolf reintroduction. According to wolf researcher David Mech, "Yellowstone is a place that literally begs to have wolves." Already home to the grizzly, it is a large and relatively wild area with abundant large prey. With the wolf's return, the alleged "overgrazing" by "overpopulations" of elk, buffalo, and moose in Yellowstone would be alleviated. There is even strong evidence that grizzlies (a Threatened species) would benefit from wolf reintroduction because they often displace wolves from carcasses.

The wolf recovery plan for Yellowstone proposed reintroducing a minimum of 10 wolf pairs in the Greater Yellowstone Ecosystem as an "experimental population." There are 50 livestock operators in the recovery area, with only 5000 cattle and 6000 sheep, all outside the National Park. Under the plan, any wolves wandering into livestock areas on public or private lands could have been killed. The federal government also guaranteed reimbursement for the full cash value of any livestock verified as lost to wolves. A coalition of conservation groups, the National Park Service, and the US Fish & Wildlife Service promoted the plan. In 1985, William Penn Mott, Director of the National Park Service, also announced his support for wolf reintroduction in Yellowstone National Park.

Despite all this, with their heavily pro-ranching Wyoming Congressional delegation firing the big guns, the Royal Ranchers stopped the plan dead in 1987. Park Service Director Mott quickly changed his tune, saying he would not support the plan unless Wyoming's Congressional delegation did. Joe Helle provided the eulogy, saying that [after 15 million years] "the wolf's place is gone," and that sheep growers, on the other hand, had been ranching for generations, and would be for years to come.

Much to the dismay of stock-men, wolves are reintroducing themselves in the northern Rockies. In the mid-1980s, 12 gray wolves wandered down from the Canadian wilderness into Glacier National Park -- the first known resident pack in the American West since wolves were all but eradicated there half a century ago. They bred, while another new pack was reported to the east on the Rocky Mountain Front. One pack moved back into Canada, however, and in 1986

(Lone Wolf Circles)

the other was massacred by government predator "control" agents after eating livestock. Today, the roughly 10 to 20 wolves remaining in the Northern Continental Divide Ecosystem (greater Glacier National Park ecosystem) constitute a very fragile population. (ADC recently shot from a helicopter another wolf accused of preying on a rancher's livestock near Marion, Montana.)

A national wildlife organization, Defenders of Wildlife, has independently raised more than $30,000 and offered to compensate northern Rockies ranchers for all verified livestock kills by wolves; it has thus far compensated 2 ranchers for livestock kills; in one incident there was strong evidence that coyotes had made the kills. Most area ranchers rejected this profit guarantee as a "public relations ploy" and continued to demand death for all stock-eating wolves. Meanwhile, one conservationist complained, "National conservation groups like 'Defenders' defend cows, ranchers, FWS and their fat budgets with money they should be using to sue FWS for violating the Endangered Species Act."

Recovery plans included radio collars for all reintroduced wolves, recapture of stock killers, laws to permit ranchers to kill stock-killing wolves, and guaranteed government compensation for lost livestock. Montana and Idaho ranchers nonetheless vowed to fight all wolf recovery efforts.

Some of the arguments given by ranching advocates for opposition to wolf recovery are ridiculous, if not humorous. Idaho Senator Steve Symms, in response to letters requesting his support for reintroduction in the northern Rockies, stated that wolves "pose a real danger to humans." Wyoming Senator Alan Simpson maintained that wolves *eat* humans. Not to be outdone in bias or ignorance, Wyoming Senator Malcolm Wallop told the Wyoming Stock Growers Association in June 1985 that proposed wolf reintroductions "threaten the state's tourists as well as ranching industries," and that "there's [sic] 50,000 wolves in Minnesota and that should be enough to keep them off the endangered species list."

Politicians and Western ranchers would do well to consider those nationally *Threatened 1200 or so wolves of a different subspecies* in northern Minnesota (along with perhaps 50 in northern Wisconsin and Michigan). Generally, they coexist amid 9800 farms that raise 91,000 sheep and 234,000 cows. There, an average of less than 5 cows and 13 sheep per 10,000 animals grazed are lost to wolves annually, and ranchers are reimbursed by the government for all losses (though some ranchers there do kill wolves illegally). Wolves there do not significantly deplete wildlife or pose problems to human use of the land (other than the abovementioned livestock kills), much less to humans themselves. In Minnesota, wolves have been accepted by most farmers as a natural part of the environment. (Wuerthner 1987)

We killed off the goddamn things once. Now they want to bring 'em back.

--Montana public lands rancher Butch Krause, *People* (9-24-90)

Despite all this, the future for the wolf in the West is not hopeless. An increasingly informed public, already favoring wolf reintroduction, can only become more pro-wolf. By a margin of 6 to 1, visitors to Yellowstone National Park said the presence of wolves would enrich their Park experience. A study by Alister Bath of the University of Wyoming revealed that 48.5% of Wyoming's citizens support wolf reintroduction, while 34.5% are opposed. Wildlife biologist David Brown reports:

When a preliminary telephone survey aimed at determining the public's attitude toward wolves showed that 61% of the 726 Arizona households queried favored bringing the wolf back to the state, the Arizona Game and Fish Commission discontinued the survey rather than offend influential livestock raisers. (Brown 1988)

A questionnaire by Arizona Game & Fish also showed 2/3 of state residents supporting wolves, even in rural areas. New Mexico surveys show 76% support for the wolf. Other surveys in Montana show good public support for wolf reintroduction. According to Hank Fischer of Defenders of Wildlife,

Throughout the US as a whole there is overwhelming support for wolf recovery and reintroductions. Even opinion polls conducted closer to areas where wolves might actually dwell show a majority of people favoring wolf recovery.

And while survival of the Mexican wolf is in doubt, Canada's wolf population, though under attack, still survives in numbers large enough to help repopulate the US.

[FWS biologist] *Bangs took a poll of the meeting room packed with wool growers to see how many favored reintroduction of wolves. Not one hand went up.*
--*High Country News* (2-12-90)

Since the 1800s gray wolves have changed greatly in habit and habitat. Today they are chiefly nocturnal, having learned to minimize exposure to humans. Likewise, they have necessarily become wasteful of food, having learned not to feed in the daylight or remain near their kills for long. As has their habitat, so has their social order been fragmented, further threatening their survival. No longer do wolves roam the grassy plains or open mesas. Rather, they slink through the remote, cold forests of the North, as far from people as they can get. Territory size is also necessarily much larger now, as their remaining habitat is much less productive and they must range farther to find food. A larger territory also brings them more deadly contact with humans.

Correspondingly, areas for reintroduction must be quite large, perhaps roughly 50 miles in diameter. And though there are many sites of sufficient size that would fit wolves' needs, *all* would result in conflict with stockmen. According to some "reasonable" ranching apologists, we should reintroduce wolves only where there are no livestock and wolves will not travel into livestock areas. Great, but *where is that place*?? Since livestock are grazed within 20 or 30 miles of every potential wolf reintroduction site in the West, and wolves may travel beyond permissible boundaries, that leaves nowhere for wolves.

We reached the old wolf in time to watch a fierce green fire dying in her eyes. I realized then, and have known ever since, that there was something new to me in those eyes -- something known only to her and to the mountain.
--Aldo Leopold

The wolf belongs in the West.

Its howl is an inspiration to all who know and love the Earth.

Bring back the wolf!

(George Wuerthner)

(George Wuerthner)

•Coyote

(Steve Johnson)

The coyote, *Canis latrans*, also known as "prairie wolf," "brush wolf," or "little wolf," resembles a medium-sized dog with a pointed nose and bushy tail. It is in fact more closely related to domestic dogs than wolves. There are many subspecies described. Usually weighing from 15 to 45 pounds, the animal measures slightly less than 2' high at the shoulder and about 3' in body length. Its color ranges generally from gray to reddish gray. The coyote is said to vary more in individual characteristics than any other North American mammal.

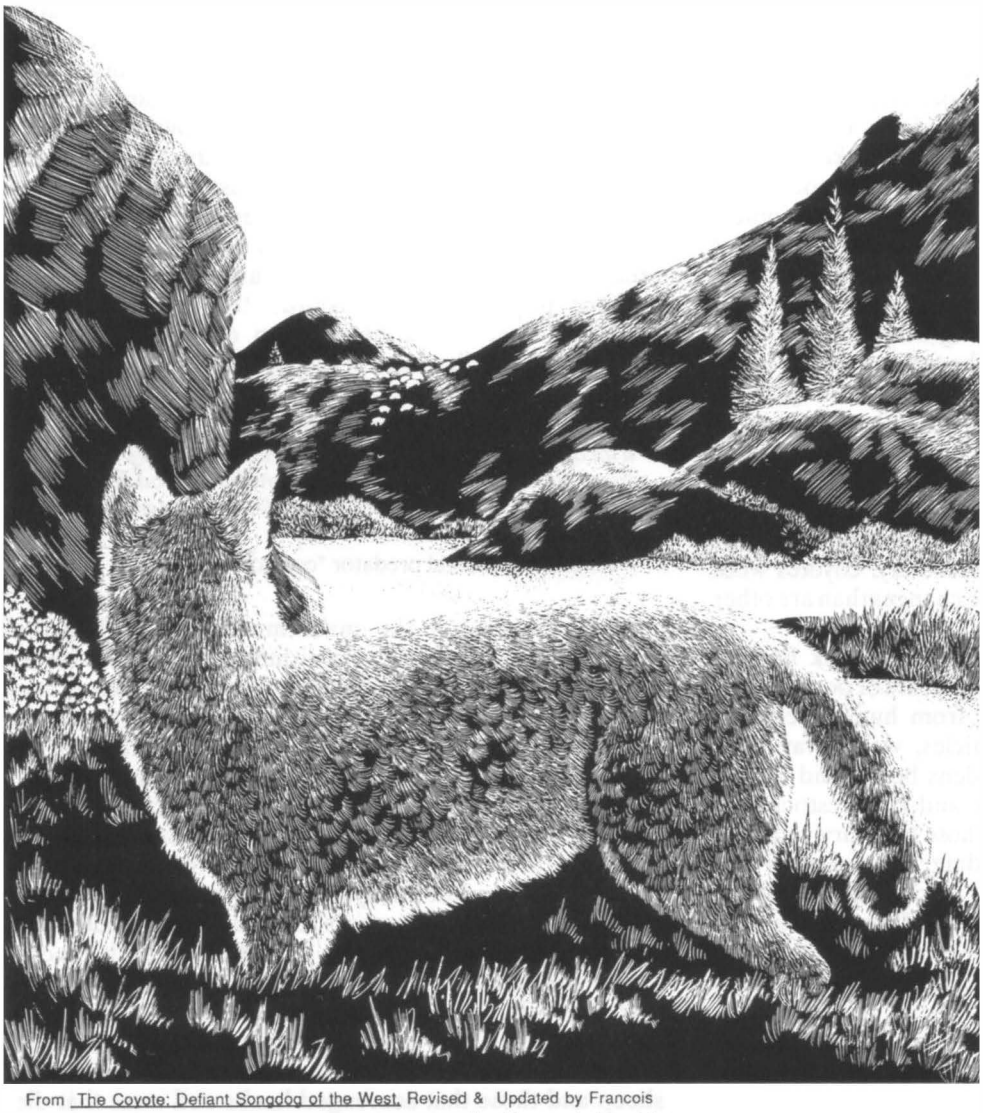
If they aren't killed by people, coyotes usually live 10 to 15 or more years. They average bearing 5 to 10 pups a year, sometimes 15 or more. Unlike wolves, coyotes may be either polygamous or monogamous, and are only loosely social. They travel and hunt alone, in pairs, or in packs. The coyote's greatest enemy, aside from humans, is the domestic dog. Coyotes can run 40 mph, swim fast, and sing well.

For perhaps 1 1/2 million years, coyotes have roamed the Western landscape. (The canine family itself probably originated in North America and migrated to the Old World, not vice versa.) For thousands of years, indigenous Americans have in many ways venerated the coyote. Perhaps more than any other animal, the coyote represents the spirit of the West.

> *No such sentimental feelings as the foregoing, however, are to be found in the hearts of the stockmen. Summed up in toto, this feeling on the part of the majority of the livestock interests is: "To you, Mr. Coyote, unending vengeance, and warfare to extermination!"*
>
> --from **The Clever Coyote** by Stanley Young and Hartley Jackson, federal predator "control" agents and advocates (Young 1978)

Possessing great intelligence and adaptability, the coyote is by far the most successful large predator in the West. Despite relentless persecution by the grazing industry and others, it has not only survived but expanded its range, though in considerably reduced numbers. Today, the coyote is said to have the largest range of any North American mammal, inhabiting almost the entire continent except northeast Canada.

Though technically carnivorous (in the order *Carnivora*), coyotes are highly omnivorous scavengers. Of hundreds of their scats I have seen around the West, most contained plant material, often more than half. The coyote diet consists mostly of small rodents and rabbits, reptiles, wild fruits and berries, grasshoppers, grass, seeds, birds, deer . . . and sometimes livestock.



From The Coyote: Defiant Songdog of the West, Revised & Updated by Francois Leydet. Copyright (C) 1977, 1988 by Francois Leydet. Used by permission of the University of Oklahoma Press.

A coyote is the most destructive thing God ever put on this Earth.
--rancher Harold Anderson, Lavina, Montana

The coyote's story is similar to that of so many others. Before the advent of ranching, it was incredibly abundant as compared to today, and was much more a pack animal with vastly different habits. According to Francois Leydet in **The Coyote: Defiant Songdog of the West**, "Early reports tell of a hundred or more coyotes being sighted in a single day, of packs of 20 or 30 chasing deer or antelope or straggling buffalo, of bands of coyotes ringing the campfire at night" (Leydet 1977). Today, though ranchers claim coyotes are "everywhere," it is rare to see more than a dozen or so in a day, including those in packs.

Early settlers shot coyotes on sight to protect livestock and promote general human advancement. The 1800s livestock invasion devastated coyote habitat, depleting their animal and plant foods. By necessity, coyotes increasingly turned to killing livestock, and ranchers increasingly turned to killing coyotes.

In fact, after wolves were exterminated, coyotes killed more stock than any other predator. As Native Americans, wolves, and bears faded from the West, the stockmen-conquerors' new rallying cry became, "The only good coyote is a dead coyote!" In the 1800s, ranchers, bounty hunters, and professional hunters and trappers killed millions. When the federal government joined in the slaughter early this century, the ranching industry became optimistic that perhaps coyotes could be eliminated completely from the West. Exciting the stockmen's imagination, the 1934 Department of Agriculture Year-book announced the government's ultimate goal as "total extirmination of the coyote in the United States."

Since 1915 federal agents alone have reported killing approximately 5 million coyotes. Ranchers and others have taken many millions more than this (though, again, little of this widespread, secretive slaughter is documentable). The killing continues essentially unabated in recent decades. According to Donald Balser, chief of Predator Damage Research at the FWS's Denver Wildlife Research Center, "The ADC took 74,000 coyotes in 1974. We know of 224,000 that were taken by others besides our trappers. Probably a half million or more coyotes are killed every year by man." The 1987 ADC *reported* coyote kill was 84,000. (Malachowski 1988)

This coyote was indiscriminately and intentionally killed by a ranchman in a pickup.

Coyotes are poisoned, trapped, snared, shot, denned, chased by fierce dogs, and run over with vehicles. No other predator has been so ruthlessly and gratuitously pursued. Because there are so few other predators left, the coyote has felt the brunt of ranchers' wrath. Hundreds of university grant research studies on coyotes and how to kill them or prevent them from eating livestock have been conducted in recent decades. Since 1972 even a government periodical has been dedicated to the death and deterrence of coyotes -- *The Coyote Research Newsletter*. Roughly 60% of federal predator "control" efforts are directed at coyotes.

Indeed, perhaps 60% of remaining livestock predators are coyotes. For several reasons they were not so easily quashed as bears, wolves, and others. First, overgrazing, along with elimination of wolves and other predators, helped periodically increase coyotes' food supply of rodents and grasshoppers ("pests") in some areas, partially compensating for degradation of their habitat. Sparse ground cover also allowed coyotes to spot and capture remaining prey more easily. With their unique adaptability, coyotes were better able to take advantage of these changes than are other predators.

Second, coyotes learned to be efficient stock hunters while evading their pursuers. Through years of persecution, many learned to immediately run from human scent or sound, hide from horses and vehicles, walk away from poison baits and traps, hide their dens better and refrain from barking or yipping near them, and kill livestock only where they could get away with it. Those that survived were those most skilled at stealth and hiding, and poisoned carcasses taught them to take only live stock. Also, like many Western species, coyotes adopted a chiefly nocturnal lifestyle. With their great resiliency, coyotes were better able than most predators to make this transition to nocturnal prey.

Third, coyotes and some other species increase their reproduction rates in response to attrition. For example, if half the coyotes in a certain area are killed, remaining coyotes produce larger litters, breed at a younger age, and procreate more frequently and take more prey, including more livestock. Studies show reproduction rates increase as much as 30% in response to population reductions (Pacelle 1988). The degree of increase generally corresponds to the degree of reduction, and populations grow exponentially from one generation to the next. One study shows that more than 50% of coyotes in a given area must be killed each year to significantly reduce their long-term population. And, when coyotes are severely reduced or extirpated from an area, coyotes from surrounding areas can move in to balance populations. Consequently, with the coyote, eradication efforts constitute an especially senseless slaughter and futile waste of taxpayers' money.

Tell you the truth, coyotes don't do anywhere near the damage a lot of ranchers and hunters claim they do. A sheep could die from disease, being lost, dogs -- anything. God knows its suicidally dumb. And if a coyote walks by the carcass, it gets the blame.

--Bill Austin, federal predator "control" agent

Coyotes are not the mass murderers of livestock portrayed by the grazing establishment. But since they kill far more livestock than any other Western predator, many ranchers have an almost paranoid delusion about coyotes. The average annual 5%-10% loss of sheep and 1%-3% loss of cattle to coyotes reported by stockmen has repeatedly been shown to be at least twice as high as actual losses. In 1984 the US Fish & Wildlife Service (which had jurisdiction over ADC at the time) estimated that more than $51 million in livestock were lost to coyotes alone that year. This figure was calculated using numbers supplied by its rancher constituents, and is widely known to be far higher than actual losses. According to J.J. McCoy in **Wild Enemies**, reasons given by wildlife conservationists for inflated figures include, "extreme bias and prejudice against coyotes by the sheepmen, failure to distinguish between coyotes that killed sheep and those that scavenged lambs and ewes that died from other causes, exaggerating sheep losses for tax purposes, and an attempt to increase federal subsidies" (McCoy 1974). Additionally, many supposed coyote kills are done instead by individuals or packs of domestic and feral dogs and dog-coyote hybrids; in some areas these types of animals make most predator kills on livestock. Wildlife biologist Dr. Franz Camenzind testified in 1982 that, "Although the number of coyotes killed by all methods in the last 12 years has more than doubled, the industry continues to claim increasing livestock losses" (Defenders of Wildlife 1982). Nevertheless, Merritt Clifton reports in "The Myth of the Good Shepherd" that in the US today ranchers accuse coyotes of killing over 900,000 sheep annually -- 9% of the nation's total! -- for a loss of $83 million (Clifton 1990).

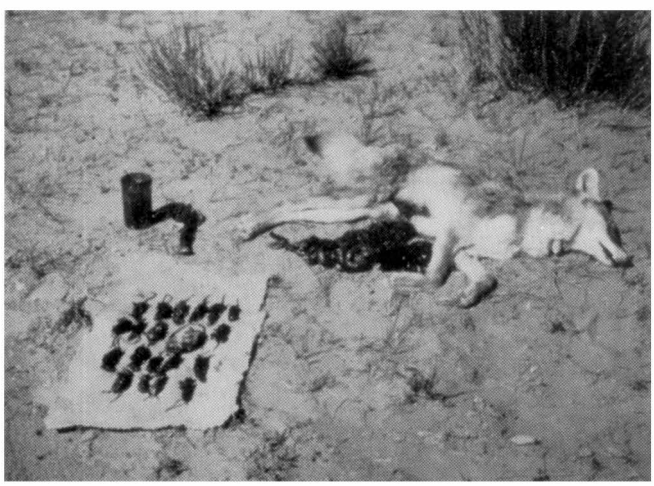
This skinned coyote carcass was left on the roadside near the entrance to Canyonlands National Park, Utah. *(Bonnie Hood)*

According to sheepmen with whom we have talked, it is doubtful if any sheep has died a natural death in the past century; extermination of all coyotes, whatever the environmental costs, is their battle cry.

--Congressman John D. Dingell of Michigan (Ferguson 1983)

According to Edward Abbey, "It's true that coyotes eat sheep. But do they eat enough sheep?" Yes, coyotes do sometimes kill sheep, infrequently calves and, rarely, grown cows. But relatively few do so on a regular basis. Of those that do, many have been injured or crippled by gunshot wounds, traps, and vehicles, so are less able to procure their normal wild prey. Most coyotes never lay teeth on livestock, except occasionally as carrion. Studies show that coyotes actually prefer livestock as carrion (favoring *old* carrion!) to killing it themselves. Ironically, most of a coyote's meat diet consists of rabbits, other rodents, and grasshoppers that compete with livestock for forage.

Similarly, claims that coyotes kill for fun or willfully torture their prey are little more than horror stories spread by ranchers and uninformed hunters to drum up hatred for their perceived competition. A coyote kills to eat, usually going for the throat and subduing its prey as efficiently as it can. A wriggling animal is difficult to eat, and coyotes do whatever necessary to still their prey. If at times while hunting they bite off a calf's tail or fail to kill an animal completely before they begin to dine, thus offending our human cultural sensibilities, it is incidental to their purpose.



Rather than beef or mutton, this coyote's stomach was filled with rodents. Millions of coyotes are wrongly blamed for livestock predation, and indiscriminately killed. *(Dick Randall)*

For refusing to succumb to relentless oppression, coyotes have been vilified with "sly," "crafty," "cunning," "tricky," "wily," "shifty," "devious," and other evil-sounding adjectives. Stockmen see coyotes as "cowardly thieves" of livestock that don't have the courage to stand up in the light of day in front of their cross-hairs to be punished for their sinful deeds. Perhaps, to men so used to getting their way, the idea of anything on the range -- especially a "smart-assed coyote" -- not being under their control is intolerable. They also blame coyotes for spreading rabies and other disease, to cattle especially. However, coyotes and their prey animals

Traditionally, ranchers throw slaughtered coyotes in piles so they may appreciate the cumulative results of their efforts and engage in a little bravado and good-natured competition with other area stockmen. Such piles are in fact quite common; I have encountered them several times while visiting ranches around the West. Usually they are hidden from view behind a back shed, under the overhang of a barn, or perhaps under a tree. *(Dick Randall)*

coexisted and thrived together for over a million years, and cattle have been shown to spread more disease than coyotes.

Some coyotes are killed by rural residents to protect poultry, chicken eggs, dogs, and cats. Many are trapped for their pelts, which may bring $15 or $20. Others are killed for what is termed "sport" by hunters and varmint callers. Still others are killed out of a warped sense of what constitutes "fun" or "duty to humanity" by emotionally sick individuals. A quote from **The Clever Coyote** by Young and Jackson typifies the mentality of many:

A dead coyote family. *(Dick Randall)*

"The trapping of coyotes is a popular and often profitable form of recreation for many farm [ranch] boys, private professional trappers, or those seeking a short respite in the out-of-doors" (Young 1978). Far more coyotes are killed by or for ranchers than by or for any other group.

Despite it all, many stockmen advertise their "respect" for "Mr. Coyote," usually in the form of a reluctant admiration for the skill and tenacity of their "worthy adversary." By thus humanizing the coyote, they suggest that its demise is less a ruthless slaughter than a noble contest between equals (as if a coyote is equally equipped or seeks to engage in battle). While openly espousing their supposed respect for the coyote, these same stockmen destroy the unfortunate animal with reckless abandon for the slightest perceived offense.

Nevertheless, there have always been a few ranchers who recognized value in coyotes and other predators. They find it more profitable to allow coyotes to prey on the small rodents, rabbits, and grasshoppers that compete with livestock for herbage than to wage war against these predators which kill so few of their stock anyway. In recent decades, more ranchers have come to understand the economics of predator "control," though they still represent only a small minority of Western ranchers. These ranchers have limited their slaughter of coyotes to known stock killers or, in rare cases, have stopped killing predators altogether.

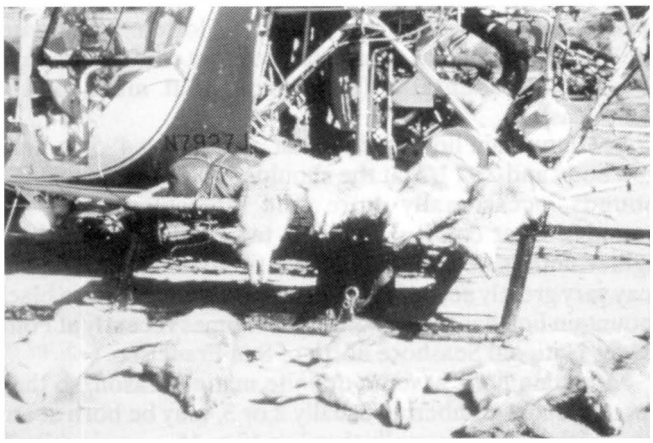
Prominant among these is Dayton O. Hyde, owner of a 6000-acre private ranch in Oregon and author of a dozen books. In his latest book, **Don Coyote**, Hyde pushes ranching tolerance to new limits, befriending a coyote and praising coyotes for their contributions to a healthy environment and successful ranching. Near the end of his book, however, Hyde clarifies his priorities, speaking to coyotes in general, telling them, ". . . as long as you make me more money than you cost me, I intend to keep you around." (Hyde 1986)

Texas House Speaker Gib Lewis was recently invited by ranchers on an aircraft mission to shoot Coyotes, who had allegedly been eating the Texas ranchers' calves, because, he said, "they know I like to kill." Proving adept at aerial gunning, Lewis murdered 90 Coyotes.

--Editor John Davis, *Earth First! Journal* (June 1988)

Elimination of the coyote is like a carrot in front of the ranching industry's nose. Many graziers have convinced themselves and each other that, "If we just could get rid of coyotes this'd be damned good stock country!" Others perceive the delusion, but continue the slaughter anyway to quell their anger or because killing coyotes is "traditional." In a word, coyotes have become a universal scapegoat for the industry. You may not be able to solve ranching problems, but you can always blow a hole in a coyote.

(Paul Hirt)



(Dick Randall)

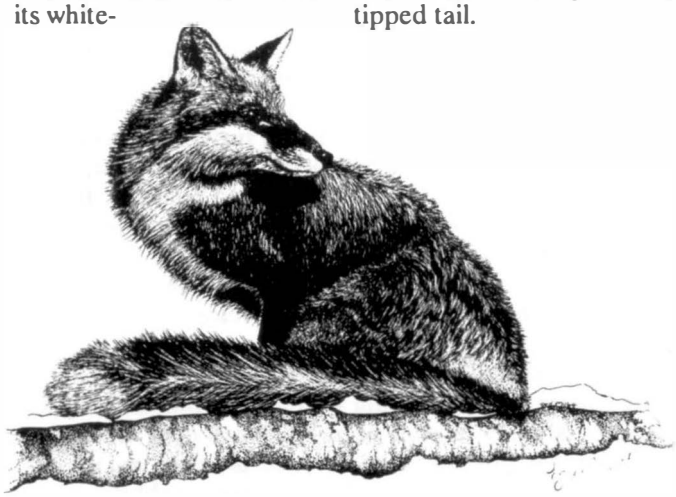
It is a mistake to attempt to analyze cattlemen's attitudes about coyotes from the standpoint of logic. . . . Cattlemen are willing to pay from their own pockets more than $120 an hour to have coyotes gunned from helicopters. . . . All this has little to do with ranching or economics, but is, instead, a stubborn vestige of macho frontiersmanship, identifying the ranchers as practicing Westerners out of the old mold. The calves saved would not even pay for the ammunition and gasoline, not to mention time.

--Denzel & Nancy Ferguson, **Sacred Cows** (Ferguson 1983)

Today, though relentless persecution and habitat destruction has greatly reduced their numbers and extirpated them completely from a few areas, coyotes continue to range throughout the rural West. The coyote may put its tail between its legs and slink away at the slightest sign of a human, but thus far it survives the onslaught.

• Foxes

Four species of fox inhabit the West -- the red, gray, swift, and kit. The **red fox**, *Vulpes vulpes*, is the most common and familiar of the 4. It is also the largest, averaging about 2' long in head and body and 10-15 pounds. This species is usually reddish-yellow with a white underside, but it may be black (the famous "silver fox") or one of many variations. Regardless of color phase, a red fox may always be recognized by its white-tipped tail.



Red fox. *(Peg Millet)*

The red fox is found throughout most of the West, except along the coast and most of the Plains and Southwest. It ranges a territory usually 1 to a few square miles, depending mostly on food availability. Red foxes may be active at any time, but are most so at night, dawn, and dusk. They are superb swimmers and do not hesitate to go into water after prey. All foxes are inveterate trotters, and can fox trot at a steady 5 miles per hour seemingly forever.

More like the coyote than are the other foxes, the red fox is the Western fox most adapted to human activities, and has, therefore, replaced the gray fox over much of its range. To some degree, it has learned to evade guns, traps, and poisons. The red fox has survived the human onslaught, but in reduced numbers and not nearly so well as the coyote.

The **gray fox**, *Vulpes cinereoargenteus*, resembles the red fox, but is a little smaller and more weasel-like, with a longer, more slender body and longer tail, which has a black median strip down its length and is tipped with black. The salt-and-pepper coat is reddish underneath. This is the only American fox that can climb trees.

The gray fox inhabits mostly the southern half of the West, northern California, and western Oregon. It prefers wilder regions than the red, which helps explain why it has not fared so well. Unfortunately, it is also more susceptible to traps and poisons. The gray fox has disappeared completely from many areas, and survives elsewhere only in small numbers.

Vulpes velox is known as the "**swift fox**" because of its quickness trotting or running across the open Great Plains where it resides. This fox is much smaller than the red and gray, being generally 15" to 20" in head and body and weighing 4 to 6 pounds. Its coat is buffy-yellow, and more uniformly colored than the red and gray, with a black-tipped tail.

The swift fox is less wary than the red and gray, and is more easily trapped, poisoned, and shot. Because it inhabits open plains and intermountain valleys of the inland West, it has suffered more from farming, livestock grazing, and, especially, the "control" programs directed at larger predators. Indeed, as an unintended victim of the grazing industry's omnipresent predator extermination campaign, the swift fox has been decimated.

The **kit fox**, *Vulpes macrotis*, is sometimes considered a subspecies of swift fox. Generally even smaller than the swift, it has exceptionally large, sensitive ears, a pale gray body washed with rust, a whitish belly, and a black-tipped tail. It is a very shy, gentle fox. If this animal isn't cute, nothing is.

The kit fox is primarily nocturnal, remaining in its burrow during most of the day. It prefers the open, dry country, grassy plains, scrubland, and sparse juniper woodlands of the Great Basin and the Southwest, including Southern California. Like the swift fox, it has been devastated by traps and poisons set to catch larger predators, as well as development, farming, and grazing. It is the rarest American fox.

All foxes are opportunistic, omnivorous feeders. Their intelligence and acute hearing and sense of smell make them superb hunter-gatherers. Their prey normally consists mostly of rodents and insects (again, ironically, animals that compete with livestock for herbage), reptiles, birds, and eggs. When prey is plentiful, foxes may stash the surplus and return to feed on it from time to time. Their plant foods include wild fruits and berries, nuts, acorns, and occasionally greens.

A kit fox. *(George Wuerthner)*

Rarely, a fox may take a fawn, lamb, or (extremely rarely) a small calf, especially if the habitat is degraded. Though the value of livestock taken by foxes in the West is minuscule, to the ever profit-minded stockman it is excessive. Thus, many foxes (even swift and kit foxes, which would be hard-pressed to kill the smallest lamb) are shot, trapped, poisoned, and, as they are great den diggers, denned. Probably even more foxes have been killed unintentionally as a result of indiscriminate predator eradication.

Many of the 30,000 or so public lands ranchers on base properties spread across the rural West keep poultry and domestic pets. Because foxes sometimes feed on eggs, chickens, turkeys, and other small domestic animals, ranchers are all the more vehement in their persecution of foxes. Under their pressure and that of farmers, fox bounties are still paid in some states and counties. In the past, many foxes were trapped for their pelts, but with the rise of fox farming in recent decades wild fox fur is no longer in great demand, so ranchers and farmers stand alone as the fox's greatest adversaries.

•Mountain lion

(Dick Randall)

Called mountain lion, cougar, lion, panther, painter, puma, and a dozen other names, *Felis concolor* is a magnificent feline. Its 27 described subspecies range from British Columbia to Tierra del Fuego, making it the most widely distributed American cat, and before the Europeans' arrival the most widespread "New World" predator. Though most popularly called mountain lion, the animal is at home in a great variety of terrain, from sweltering, jagged desert escarpments to icy high mountain forests. The mountain lion that once inhabited the entire area that became the contiguous United States now survives only in much reduced numbers in the most rugged, wildest West, and as a population of 30-50 of the Florida panther subspecies in the swamps of southern Florida. Otherwise, predator "control" has eliminated cougars east of Texas and the Rocky Mountains (and throughout much of the Americas).

The mountain lion is a *large* cat, measuring 4'-5' in head and body and 2'-2 1/2' at the shoulder and weighing 80-200 pounds, occasionally more (the largest are over 300 pounds). Coat color generally is tawny to grayish, with a lighter underside and dark brown tip to its long tail, but it may vary greatly according to geographic area. A pure black mountain lion has been spotted a few times recently at Point Reyes National Seashore north of San Francisco.

Mountain lions have no definite mating season, so their spotted cubs, numbering usually 2 or 3, may be born at any time of the year. Normally they live 10 to 15, occasionally 20 or more, years. They have few enemies besides humans, and are considered remarkably free of disease and parasites.

Pumas are chiefly nocturnal, now even more so as a defense against human assault. Their wail at night excites the fears of some people, who perceive it as a fiendish, unearthly shriek. However, the cougar is the most timid of all the world's large cats. Solitary, secretive, wary, and elusive, it is so seldom seen by humans that a glimpse even of its footprints is a special treat.

Reports of mountain lions attacking and eating humans are almost invariably spread by the ignorant, gullible, overly excitable, or paranoid, and by ranchers and hunters seeking to give the animals a bad name. Of the 52 documented lion attacks on humans in the past 100 years in the US and Canada, only 10 were fatal. Most attacks are thought to be the result of lions incapacitated by old age, injury, or disease, mistaking humans for prey, or of aggressive people provoking the attack.

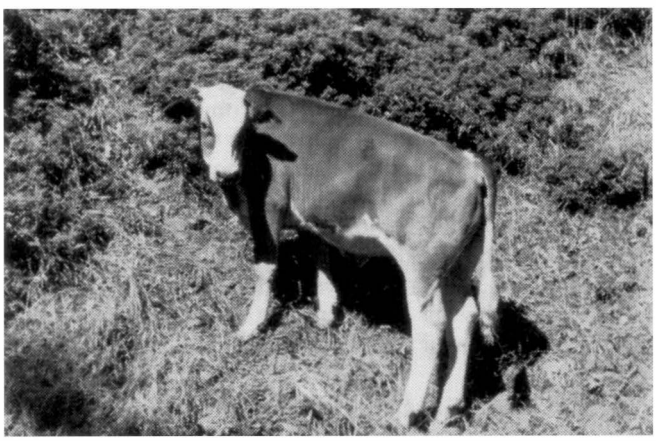
The mountain lion is the most agile and skillful hunter in the West. A cougar can leap 40', and one was seen jumping 18' *straight up* into a tree. Like most cats, it can run very fast for short spurts, but tires quickly. So in hunting it stalks, or sometimes ambushes, its prey, then makes a quick dash and powerful leap upon the victim, killing it quickly by breaking or biting its neck. In the pre-European West, mountain lions used to eat their fill, then later return to the carcass, but due to persecution they rarely do this anymore.

Because the cougar is such an effective hunter, it can afford to be a selective consumer. When habitat permits, therefore, most of its prey will be deer -- overwhelmingly its favorite food -- and a cat may take 50 deer annually. That Western deer numbers have remained relatively much higher than those of other large mammals since last century is a major factor in the mountain lion surviving even as well as it has. On the other hand, because it kills deer, many hunters have teamed up with ranchers to eradicate the big cat, conveniently unaware that much greater numbers of both cougars and deer coexisted for millennia. The West's low "game" populations are caused by ranching, introduced disease, overhunting, and habitat development and fragmentation, not by predation.

Cougars establish distinct territories of 100 to 300 or more square miles and roam within these borders, but will wander 100 miles away if need be. When deer are scarce, they may eat porcupine (a favorite in some areas), elk, pronghorn, bighorns, javelina, beaver, rabbits, mice, coyotes, raccoons, skunks, wild turkeys, rabbits, fish, slugs,

grasshoppers, and a great variety of other animals. Like all cats, they are almost exclusively carnivorous. But unlike many, the cougar will not scavenge or eat carrion unless it has no choice.

The big cats also kill and eat livestock. Though studies show they rarely attack cattle weighing over 500 pounds, a mature mountain lion has little problem bringing down a medium-sized heifer or steer, and a calf or sheep makes a tasty treat. What hungry person would refuse a plate of food set at her or his feet? Yet, lions that eat cattle or sheep in their home range are branded "bad" and relentlessly pursued.



Mountain lion food.

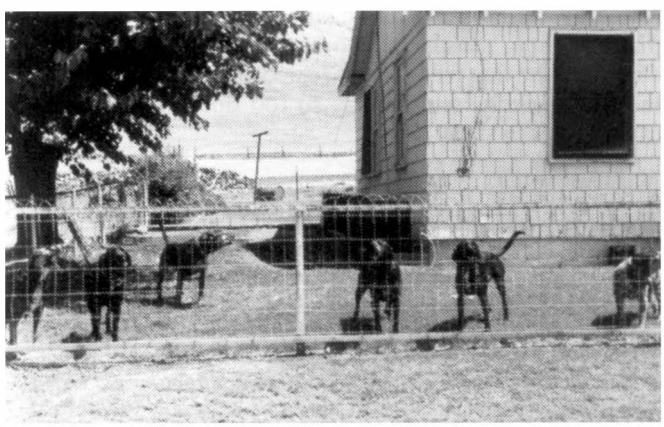
There have been many accounts of one puma killing 30, 40, or even up to 192 sheep in one night. Such mass slaughter, usually put down as performed in an excess of "blood lust," results from the fact that the cat's urge to pounce upon a victim is constantly being reactivated by the penned-in animals helplessly milling about it. The situation it finds itself in is quite abnormal, and so, too, is the puma's reaction.
--C.A.W. Guggisberg, **Wild Cats of the World**

Still, few mountain lions kill livestock regularly or in large numbers. Again, losses claimed by ranchers usually have little to do with reality. As with all large predators, the grazing industry branded cougars as varmints and has for more than a century persecuted them with genocidal fervor.

Being powerful and exceptionally elusive animals, however, they were not easy to kill. Because pumas disdain old meat, poisoning was not effective. Stockmen got a lucky shot off here and there, but the real killing was done with dogs and traps, often by professionals. Bounty hunters sometimes followed stock-killing lions for months. With experienced dogs, they were often able to tree or corner the cats and shoot them. Though cougars are wary of traps, trapping became much more effective when it was discovered that they were attracted to catnip and other scents.

Stockmen commonly and discreetly pressure state game and fish departments to increase allowed predator kills under the guise of protecting "big game" species, primarily deer, from predation. However, for decades the big cat has been hunted for "sport," often by or with assistance from ranchers. In recent years the puma's popularity as a "game" animal has grown rapidly. Many public lands ranchers have set up guide services for hunting the animals with dogs (many often already owned packs of hounds for hunting predators). Wealthy "sportsmen" (many of them ranchers themselves) are taken out on horseback to a public grazing allotment. A pack of dogs finds a cougar's scent and pursues the terrified animal until it becomes so exhausted or scared that it climbs a tree. With the dogs barking and the mountain lion cowering in fear, The Great Hunter rides up, dismounts, aligns the cross-hairs of his $1000 high-powered rifle, and blasts the cat out of the tree. For his service the stockman receives $100-$200 a day and the satisfaction of knowing one less lion lives. In winter, when tracks can be followed indefinitely, cougars are pursued by "sportsmen" on snowmobiles.

Southern Arizona public lands rancher Doug Cumming is one such professional hunting guide. On his ranch he keeps 5 well-trained hounds for pursuing predators. Customers from around the US pay hundreds of dollars apiece to visit "his" ranch, jeep out onto the range, and "bag" a mountain lion. Cumming, now 82, remembers when "there were lots of wolves around." He has been a lion and coyote hunter all his life. A rural newspaper submits that, "Cumming is a defender of mountain lions and coyotes, but hunts the cats to save his herd of cattle."



A surprisingly large percentage of ranchers own hounds trained to pursue mountain lions and other predators, and to kill "pests."

Just 20 years ago, every Western state and Canadian province paid bounties on mountain lions. Texas and Wyoming, where the mountain lion has been practically exterminated, still classify the animal as a "varmint" species. But, in recent years, as cougar populations plummeted and environmental awareness grew, most Western states removed the mountain lion from their varmint lists and assigned it "big game" status, meaning ranchers may still kill them whenever they claim predation, though other people must obey hunting regulations to kill the animal. Regardless of current legalities, stockmen continue their own covert slaughter of cougars, often hiring professional hunters.

In the Southwest, ADC currently is lobbying county governments for local funds to match federal funds to mount "pre-emptive" campaigns against lions that *may* kill cattle. In Arizona, hunting is allowed year-round. Estimates from Arizona Game & Fish biologists and experienced hunters range from 100 to 600 lions killed by ranchers each year, in addition to annual "sport" hunting kills (often by ranchers) of about 200 out of the state's estimated 2500

resident adults (Dagget 1990). The situation in most Western states is similar. The Yuma puma, which ranges the hot, arid flats, mountains, and tangled bosques of the lower Colorado River valley, recently was the first Western mountain lion subspecies designated as Threatened. It may be one of the most endangered animals on Earth; yet year-round hunting of the cat is still allowed, as is its slaughter as a stock predator.

I would like to say I can feel for these people who want to protect the mountain lion. These people, however, are obviously city dwellers. The lion is one of the most deadly killers in the world. My ancestors fought him well over 100 years ago.

--public lands rancher Lewis Oliver, Grant County, New Mexico

In 1983 the New Mexico Department of Game and Fish released a report concluding that the state's mountain lion population had dropped sharply and that livestock depredation was infrequent and economically insignificant. Livestock losses to lions in New Mexico that year were estimated at $30,000, yet government agents spent $90,000 in tax dollars to kill mountain lions. New Mexico ranchers continue to pressure state legislators to return the lion to its former "varmint" status, to be killed by anyone, any time, any place. Some ranchers promote serious proposals to eliminate the lion from New Mexico completely, as they did the wolf, grizzly, and jaguar; so too do many ranchers in every Western state.

New Mexico's Game and Fish Commission is in hot water following what many say was an illegal picnic. Four of the five commissioners took an unpublicized horseback trip to the Guadalupe Mountains, where they met for a barbecue with ranchers who want the state to kill more mountain lions. . . . Soon after the horseback ride and picnic the commissioners approved new rules allowing "preventative" killings of mountain lions without requiring proof that a particular cat killed livestock. (Note: A judge in Santa Fe subsequently upheld the legality of the killing, even while acknowledging that the meeting violated the Open Meetings Act.)

--*High Country News* (6-22-87)

Hughes is a leader among ranchers urging lion trapping. She estimates that her family's ranch lost nearly $50,000 in livestock to verified lion kills over the last five years. "We expect a certain percentage of losses, but not years in which we are suffering the loss of 70 to 80 percent of our income just from lion losses alone," she says. The [New Mexico] *game department pays Hugh's father $35,000 a year under a contract to trap lions in the Guadalupes.*

--*High Country News* (7-6-87)

The mountain lion population of aboriginal California is estimated to have been roughly 20,000. Historically, ranchers have been the state's biggest killers of mountain lions. Along with hunting, fire suppression, overgrazing, and habitat destruction, ranchers' predator elimination programs nearly extirpated the cat from most of the state by 1973, when a moratorium was imposed on lion hunting. Though ranchers continue to kill them secretly, the lion population has subsequently risen, with estimates varying from 2000 to 5000. In 1986 the moratorium was ended, and the California Fish & Game Commission has twice since tried to institute trophy hunting of lions. Fortunately, the Mountain Lion Preservation Fund has blocked these efforts in the courts.

With comparatively strong mountain lion protection and much rugged, inaccessible habitat, California probably has the largest population of any Western state. Counting such an elusive animal is difficult guesswork at best, and few mountain lion censuses have even been attempted. In fact, most state Game & Fish Departments have no idea how many lions live in their states, though they continue to legally allow ranchers to kill them. For example, estimates of the number of big cats in Colorado range only from 1500 to 3000, yet stockmen may kill them as stock predators. In Nevada, where the lion population is probably even lower, ADC alone killed 41 mountain lions in 1988.

The mountain lion is extirpated from most of its natural range, and remaining populations are very sparse. Current ostensibly "high" populations are at most 1/5 original numbers, probably far less. Most Westerners have never seen a lion print, much less the animal itself. In sum, ranching is by far the biggest single factor in the decline of the West's mountain lions. Lion skin never did have much commercial value, and today its chief value is as a trophy or rug to decorate the floor or wall of a hunter's or rancher's den.

So a mountain lion kills a few sheep. What do we expect? Should we extirpate the lions to make the world safe for livestock? I think not.

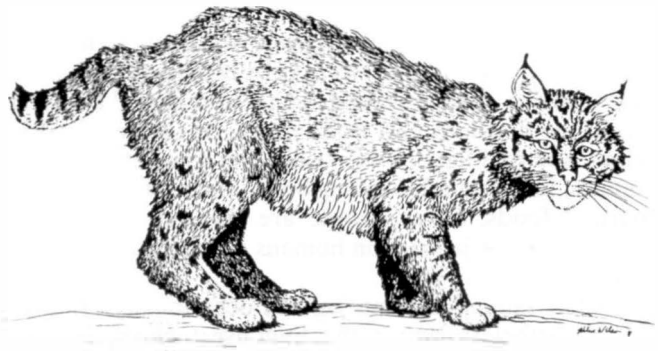
--The late David Gaines, ecologist, Mono Lake Committee, letter to editor of 7-24-86 *Mono Herald*, Lee Vining, CA

•Lynx

The lynx, *Felis lynx*, is a medium-sized, powerfully built cat with long, sturdy legs, a black-tipped, stubby tail, and triangular ears tipped with tufts of black hairs. A close relative of the bobcat, it lives in far northern and high mountain country and has adapted to the cold by growing a warm coat of fur and large paws, which in winter are so thickly furred that they serve as snowshoes. The lynx is much more a forest animal than the bobcat, inhabiting rough, mountainous terrain, sometimes swamps, only occasionally venturing into broken or open country.

Lynx mark their typical 8-12 square mile territories with tree scratches, droppings, and urine. In hunting, the lynx usually stalks its prey as closely as possible, then pounces on it in 1 or 2 bounds. Its diet consists mainly of snowshoe hares, supplemented with rodents, birds, and fish, occasionally a young deer or fox -- or a sheep or very rarely a young calf.

Its remote habitat and primarily solitary, nocturnal behavior help protect it, but a predator in the West has little chance of escaping the ranching industry, or humans in general. Bounties were paid. Shooting, poisoning and trapping (often as a non-target animal) by sheep and cattle interests and their government agents, fur trapping, overhunting, and habitat intrusion, have greatly lowered the lynx's numbers and extirpated the cat from much of its southern range. Whereas the lynx originally ranged well south into the Rocky Mountain West and Oregon mountains, it is now rare in the lower 48.



(Helen Wilson)

•Bobcat

The bobcat, *Lynx rufus*, is slightly smaller than the lynx, measuring about 2' to 2 1/2' in head and body, 14" at the shoulder, and weighing from 15 to 30 pounds. Its legs are more slender and feet smaller. The ears are less conspicuously tufted, if tufted at all. The shorter coat is of varying shades of buff or brown, with many indistinct dark spots. The "bob" tail, from which the bobcat derives its name, is tipped black on the upper side only. Like all cats, the bobcat's long whiskers are equipped with sensitive nerves to determine the width of tight places. Its surreal yowling is a sound not soon forgotten.

Bobcat *(Steve Johnson)*

Though the lynx is closely related, the bobcat is a distinct species and seems to have been present in North America long before the lynx crossed over the Bering Strait from Asia. The bobcat is much more widespread than the lynx, inhabiting sagebrush country, semi-desert regions, forests, brushlands, wetlands, rimrock areas, and a wide variety of habitat throughout the West, as well as the East. Like the lynx, it marks its roughly 8-12 square mile territory with scratchings, droppings, and urine. And, like the lynx, the bobcat is a chiefly solitary and nocturnal animal -- much more so since human intrusion.

Bobcats prey mostly on small mammals and birds, and they are good fishers. They eat larger prey, such as deer, pronghorn, sheep, and calves, only when smaller game is scarce (such as on overgrazed ranges) or as fresh carrion (or, in the Northern Rockies, when deep snow makes deer comparatively easy prey). A bobcat sometimes will leap on the back of a larger victim, such as a deer, then bite the neck just below the back of the skull to kill the animal. The desperate prey may run for a long distance with the bobcat riding on its back, biting and scratching to bring it down.

Bobcats generally cause little livestock loss, only occasionally killing a sheep or small calf, though they sometimes become costly to sheep ranchers during lambing season. In a study by Charles C. Sperry of the US Bureau of Sport Fisheries and Wildlife, in which the stomachs of 3538 bobcats were examined for their contents, investigators found that rodents constituted 46% and livestock only 2% of the animals' diet. Significantly, 70% of these study bobcats came from the 15 Western states and most of them had been exterminated as stock killers by federal agents at the request of ranchers. In another study, this one on the rocky Snake River Plain in southeastern Idaho, Theodore N. Bailey found no remains of sheep in 300 bobcats' stomachs and feces.

Bobcats eat mostly small mammals -- here, a jackrabbit -- and birds. *(Steve Johnson)*

Bobcats, though shy and secretive, are unfortunately one of the easiest animals to trap, and prime pelts fetch as much as $200. Yet the ranching industry has been the most overall potent factor in the bobcat's decline in the West; the cat survives at a small fraction of its aboriginal population. Since 1915 the federal government alone has reported killing roughly a million bobcats and lynx, primarily for stockmen. Ranchers and their attendants have trapped, shot, poisoned, and denned bobcats for more than a century, and, as always, livestock and range development have . . . .

Early bobcat killers labeled the animal "wildcat" because it fought so fiercely for its life when cornered or trapped. May the wild cat outlast cattle and sheep and continue to roam the wild West!

A bobcat in a steel leghold trap. *(Paul Tebbel)*

•Jaguar

POSSIBLE FORMER JAGUAR RANGE

America's other big cat, the jaguar, has been all but forgotten by wildlife and land management agencies. . . . What right have Americans to expect other countries to protect el tigre, *it might be asked, if we do not demonstrate an effort of our own?*
--*Wilderness* (Winter 1988) (Brown 1988)

Few Americans realize that before European intervention jaguars roamed what is now the Southwestern United States for tens of thousands of years. The world's third largest cat was a widespread resident of parts of Southern California, much of Arizona and New Mexico, and most of Texas. It ranged as far east as Louisiana and north as far as northern Texas, the Sangre de Cristo range in New Mexico, the Grand Canyon in Arizona, and the southern Sierra Nevada Mountains in California. Early explorers reported numerous jaguars in the swampy jungles of the Colorado River delta.

Panthera onca is one of the most beautiful animals on Earth. It is the largest and most powerful wild cat in the Americas, and around the globe only tigers and African lions are bigger. Jaguars average around 150-225 pounds, but occasionally weigh up to 350 pounds. They measure 4'-5' in head and body and 2'-2 1/2' at the shoulder.

The jaguar's tawny coat is uniformly spotted with black. The spots on sides and back form rosettes with small black dots in the centers, and the white belly, legs, face, and tail are covered with black spots.

Like mountain lions, jaguars are basically territorial animals. In northern Mexico they are known to roam areas of roughly 200-1000 square miles. They favor open forests, scrublands, savannas, swamps, and riparian areas.

The jaguar's extremely strong jaws, with heavy bones and massive teeth, allow it to kill its prey by crushing the skull or biting between vertebrae and neatly severing the spinal cord. In the northern part of its range, its favored food is javelina, and to a lesser extent deer, but a variety of other mammals, fish, ground-dwelling birds, and reptiles are also important foods. Many people are terrified of jaguars, though attacks by jaguars on humans are almost as rare as attacks by mountain lions.

Also like mountain lions, jaguars occasionally eat livestock. Nevertheless, jaguars that hunt livestock are likely to be diseased, crippled, old, have blunted teeth, or be otherwise incapacitated. As a rule, they take inferior livestock from depleted ranges.

To put it simply, the Jaguar was incompatible with the livestock industry. . . . Several of the Jaguars reported taken . . . were poisoned by US predator control agents . . . Most of the rest were taken by ranchers and their employees.
--David Brown, **The Wolf in the Southwest** (Brown 1984)

To the stockmen who invaded the West, **no** amount of livestock depredation was acceptable. The jaguar would go the way of the wolf, grizzly, and others. Hundreds were slaughtered in the late 1800s. The last jaguar in California reportedly was killed in 1860. In Arizona, where the cat held out longest, the reported jaguar kill was 23 in the first decade of the 1900s and 15 in the second; *actual* kills undoubtedly were far higher. In the 1920s, the reported kill dropped to 8; in the '30s, 5; in the '40s, 6; and in the '50s, only a few. (Over the same half-century, 6 jaguars were reported killed in New Mexico, where the last known was killed in 1925, and about a dozen in Texas, where the last was reported destroyed in 1946.) In Arizona in the '60s, 3 jaguars died, and the '70s and '80s had 1 recorded death each. Thus did the industry's guns, dogs, and traps effectively extirpate the jaguar from the United States.

The jaguar still survives in Mexico, where it is known as *el tigre*, and in Central and South America. Individual jaguars occasionally wander over the border from Mexico into southern Texas, New Mexico, and Arizona, but while trying to recolonize their northern habitat invariably they are killed, usually by stockmen.

The most recent killing occurred in southeast Arizona's rugged Chiracahua Mountains, where 2 birders reported seeing a jaguar in 1986. The most frequently related version of the story goes like this: In 1988, a public lands rancher/hunting guide from nearby Willcox, after tracking the jaguar with his hounds for 3 days, finally bayed the animal and shot it. To show off his success, the killer took the carcass to town, where people came to see the dead beast and some took pictures. It is said a celebration of sorts took place in the small, rancher-dominated community.

Killing a jaguar or possession of jaguar parts is a Class II misdemeanor in Arizona, with a possible fine of around $750. According to local newspapers, although the Arizona Game & Fish Department is fully aware of the murder, it is unable to press charges. It found no *corpus delicti*, and locals are afraid or unwilling to finger the murderer, who is part of a locally powerful ranching family with "a reputation for vengeance." "They're real wild west," a Game & Fish Commissioner said "The fear is genuine." The local livestock

community is protecting him, and it has not disavowed the jaguar killing.

Ironically, jaguar killers in the US cannot be prosecuted under the federal Endangered Species Act. Though the jaguar was federally listed as Endangered in 1972, it is now considered "extinct" -- not Endangered -- in the US, so it has no protection under the Act. This loophole apparently was arranged at the insistence of the livestock industry.

> *Endangered status for the* [jaguar], [political experts] *say, could entail restrictions on habitat destruction or even pressure for reintroduction, measures that would prove extremely unpopular with the politically powerful cattlemen who worked so hard to exterminate the animal. Pressure from ranchers has blocked any protection possible from either state or federal government.*
>
> --Dan Dagget, environmental journalist

Possible reintroduction sites exist in the mountains of southeast Arizona, southern New Mexico and Texas, but jaguars do not transplant well. They wander so widely that even the largest transplant areas may not contain them; individuals have been known to travel more than 500 miles. Some say no transplant areas of adequate size remain. Actually, this tendency to wander long distances could also be considered a major factor favoring reintroduction. Perhaps the best hope for the jaguar's recovery in the Southwest US is to protect its few remaining ranges in northern Mexico and wait for individuals to wander north across the border. However, the number of reported jaguar sightings in the US has dropped sharply in recent years, indicating that the cat is in trouble in Mexico. (The last sighting in the US was made in 1988 by a couple of javelina hunters about 15 miles north of the Mexican border.) Unfortunately, hope for the jaguar's recovery seems slim in light of Mexico's extreme human overpopulation and economic crisis, and its continued slaughter by Mexican stockmen.

Realistically, the long-term prognosis for the jaguar's survival in northern Mexico is almost as poor as its chances are for recovery in the US. If the jaguar is to return to its rightful place on the Western landscape, something radical must happen soon.

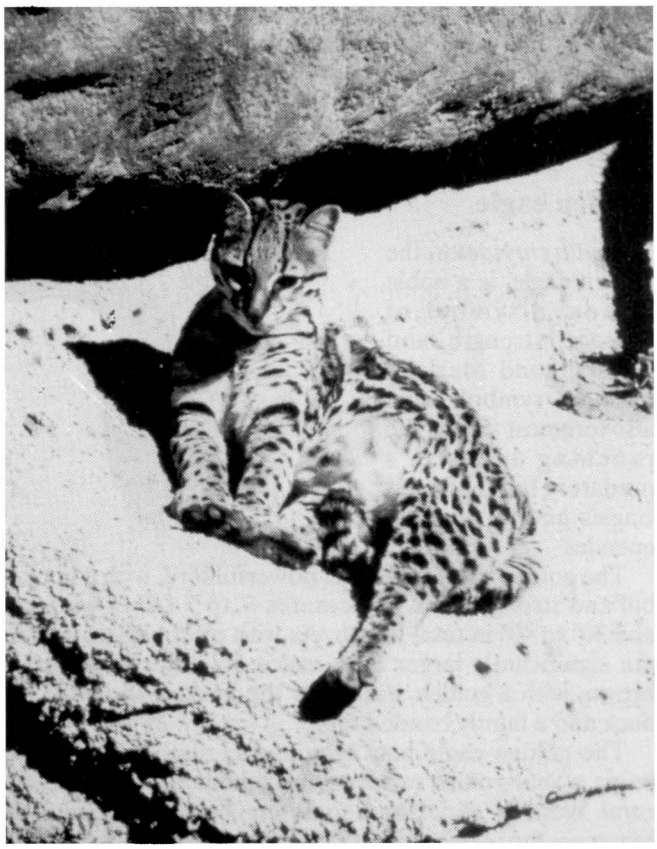
•Ocelot

The ocelot, Felis pardalis, is another little-known predator victimized by ranching. This beautiful cat resembles a small jaguar, with similar coloration and lines of elongated spots, more nearly stripes than spots, that serve as excellent camouflage. Most ocelots measure 2 1/2'- 3' in head and body and weigh 20-40 pounds.

Ocelots live in tropical and subtropical forests, riparian zones, thorn scrub, and rocky areas, and spend much of their time in trees. Basically nocturnal, they often pass the day asleep on the branch of a tree or in thick brush. They are also good swimmers. The ocelot diet consists mostly of small mammals and birds. They will eat small livestock or raid hen houses if circumstances dictate, but generally they shun humanity and rarely show themselves in the open.

Before the livestock invasion, the ocelot inhabited a range that included southern portions of Arizona, New Mexico, and Texas. Apparently, they were not uncommon in the low mountains and riparian zones in and near the Tucson basin and Salt River Valley near what is now called Phoenix.

Ocelots were killed to protect livestock or as non-target species in predator "control" efforts, and for their valuable, attractive skins. Habitat destruction, especially of riparian areas, by ranching has been a major detriment. Today, ocelots are effectively extirpated from the Southwest, though a few hang on in southern Texas, especially along the lower Rio Grande Valley.



An ocelot.

•Jaguarundi

Yet another native cat extirpated from the Southwest is the jaguarundi, *Felis yagouaroundi*. This intriguing animal is smaller than the ocelot, usually weighing 15-18 pounds, or about twice the size of the average house cat. Jaguarundis come in 2 color phases, red and gray -- sometimes in the same litter. The coat is uniform in color, ranging from fox-red to chestnut or blackish to brownish-gray.

With its small, flattened head, short legs, elongated body, and very long tail, the jaguarundi looks almost as much like a weasel or otter as a cat. It slinks along the ground through the lowland thickets and river bottoms it inhabits, and even enjoys swimming.

Jaguarundis are much more terrestrial than ocelots, living and hunting mainly on the ground. They are also less nocturnal than most cats, and frequently patrol their thickly vegetated haunts in broad daylight. Food is mostly ground-dwelling birds and small mammals, but they can take young deer, and even an occasional sheep or small calf if they must.

The jaguarundi's demise was accomplished like the ocelot's -- with the ranching industry's dogs, guns, poisons, traps, and overgrazing. Like the ocelot, it also suffered greatly as a non-target species, though it wasn't killed so much for its skin. And like the ocelot, the jaguarundi that once inhabited southern portions of Arizona, New Mexico, and Texas now survives only in small numbers in southernmost Texas.

It is time to see the border cats -- Jaguar, Ocelot, and Jaguarundi -- not as tropical exotics who infrequently visit north of the Rio Grande or Gadsden Purchase line, but as integral and proper resident members of the natural community of Arizona, New Mexico, Texas, and even California.
--Dave Foreman, environmental activist

•Golden eagle

Aguila chrysaetos, the golden eagle, is a noble raptor, a symbol of courage, strength, and freedom, and Mexico's national symbol. It is also foremost among the ranching industry's predatory bird enemies. Eagles have no natural enemies.

The golden eagle is a large, powerful bird, with a hooked bill and strong talons. It measures 6' to 7 1/2' in wingspan and 30" to 40" in total length. As with most eagles, females are significantly larger than males. Its color is uniformly brown, with a golden wash over the back of the head and neck and a faintly banded tail.

The golden eagle may be found in almost any terrain, being a year-round resident throughout nearly the entire rural West. It glides and soars on air currents, circling, scanning the earth with sharp eyes, dipping and rising, occasionally beating its great wings, frequently changing direction, until it spies a prey animal.

Unfortunately, the golden eagle has often been pictured as cruel and savage, always ready to dive-bomb some innocent victim. Even today some people believe old tales of golden eagles carrying off young children and devouring them in secret caves. As usual, stockmen are foremost among the detractors. They accuse the birds of, among other things, killing (and even carrying off) large numbers of lambs and calves. In truth, golden eagles may occasionally take a small deer or other immature large mammal, a lamb, or even a very small calf, if nothing else is available (as is often the case on livestock ranges). Normally, they feed on rabbits, squirrels and other rodents (animals that compete with livestock for forage), snakes, birds, and carrion. As for "carrying off" young livestock, a golden eagle is incapable of carrying more than 5 or so pounds, so the most that one could fly away with would be the smallest newborn lamb or an aborted fetus. At least 5 major studies on eagles and their predation on livestock, including one by the Advisory Committee on Predator Control, show that livestock losses to eagles are frequently exaggerated.

Be that as it may, stockmen have shot, trapped, and poisoned golden eagles for more than a century. Eagles feeding on livestock carrion often were wrongly blamed for the deaths. Ranchers and many other early Westerners compulsively shot at any large bird in the sky.

Golden eagles were finally given federal legal protection in the 1960s only after conservationists pointed out that the bird was in serious difficulty due to indiscriminate slaughter by ranchers and "sportsmen." The Golden Eagle Protection Act was passed in 1962, due in large part to research that showed the bird's main food consists of rodents that compete with livestock for forage. But, as usual with wildlife protection laws, ranchers were exempted; by obtaining a special permit they were allowed to kill any golden eagles they accused of killing stock.

Furthermore, as we have seen time and again, legalities have little do with what actually occurs out on the range. Thousands and thousands of golden eagles have been killed illegally since their protection law was passed in 1962. Illegal bounties are still paid. Many ranchers, sheepmen especially, shoot at, trap, or poison golden eagles or any large predatory bird.

For example, in 1971 the remains of 48 golden and bald eagles were discovered in Wyoming. Tests showed that they died from thallium sulfate poisoning. A rancher arrested for the crime admitted to 29 counts of violating state game laws for shooting antelope, inserting thallium sulfate into their carcasses, and leaving them as bait. Ostensibly, since the prosecution could not prove the rancher (as usual a politically powerful individual) intended to kill eagles rather than coyotes, he was given the minimum penalty under law -- a $675 fine.

A golden eagle poisoned by ADC. *(Dick Randall)*

But although this Wyoming rancher went practically unpunished, the case helped uncover the industry's secret war on eagles. In the early 1970s, it was discovered that wealthy ranchers in Wyoming and Colorado had hired a helicopter pilot to fly missions in which more than 800 golden and bald eagles were illegally shot and killed. Many of the dead eagles were found under a dump on federal land adjacent to a ranch owned by one of the suspected eagle killers. This man, a wealthy banker, was said to be the largest sheep breeder in the country and one of the largest land owners in Wyoming. Subsequent testimony from the pilot revealed that aerial eagle shootings were common, that many eagles were also shot from the ground and poisoned, and that competitive grazing animals such as elk and pronghorn were also slaughtered. Most sobering was the pilot's attitude that these kinds of activity were not at all unusual on the Western range. For punishment, the livestock industry-influenced court system once again gave the eagle killers minimum fines and sent them back to their banks and ranches. In fact, while 4 of the sheep ranchers implicated in the eagle killings were paying fines totally only $2875, they received at least $443,519 in wool price support payments in 1971. (National Audubon Society 1973)

Another golden eagle poisoned by the ranching establishment. *(Dick Randall)*

The legal killing of golden eagles as livestock predators continues. As a random example, according to the Montana Department of Livestock, between 1975-1980, 357 golden eagles were reported trapped on or near Montana sheep ranges. Undoubtedly, many more were killed but not reported.

Huge numbers of golden eagles are also killed by traps and poisons as (reportedly) non-target victims. For example, in 1973 a US game management agent in Las Vegas reported that a study he conducted in Nevada showed 2000 eagles and nearly 1000 other raptors had been "accidentally" caught in coyote and bobcat traps during winter 1972-73.

The aforementioned slaughter of 800 eagles in Wyoming and Colorado created a public outcry. Unfortunately, the commotion had no apparent effect on the behavior of the rural ranching community -- people who consider the remote West theirs to do with as they see fit, people who rarely have to answer to a higher authority and who in fact widely consider themselves the highest rural authority. The actions of these well-armed stockmen out on the West's remote hundreds of millions of public acres are rarely observed by outsiders. It seems certain that the secret slaughter of eagles continues undiminished.

Before the 1800s, golden eagles were a common sight in the Western skies; according to many historical accounts, on an average day at least several were spotted. Primarily due to the grazing industry, their numbers have been cut so drastically that a person is now lucky to see a few golden eagles in a week.

• Bald eagle

(Steve Johnson)

The golden eagle is doing well compared to the other Western eagle -- the bald eagle, national symbol of the USA. *Haliaeetus leucocephalus* occurs in two races, northern and southern, which are quite similar. The bald eagle averages about the same size as the golden, but varies more. Wingspan may be 6' up to 8' or so -- one of the longest of all birds. Weight averages 7-15 pounds.

The bald eagle's white head and tail and huge yellow bill distinguish it from all others. It is a graceful, skillful flyer, and its sight is thought to be 8 times more acute than that of humans. Bald eagles can live 40 years. They often mate for life, building their nests in tall trees or on cliffs, where the female lays usually 2 eggs. A pair frequently will come back to the same nest year after year, building it ever larger, even to the size of a small car!

The native range of the bald eagle includes nearly all of the West, as well as much of the East. In the northern half, it is a year-round resident; in the southern half and the Great Plains, it winters. The bald eagle is a water-oriented animal, rarely venturing far from the ocean, rivers, marshes, or lakes. In fact, this raptor is known as "fish eagle" for its normal diet is 70%-90% fish, supplemented with ducks, reptiles, and small mammals.

Thus, stockmen's claims of bald eagles killing livestock are even more outrageous than of golden eagles doing so. Yet, over the years many thousands of bald eagles have been killed as stock predators. Thousands more have been shot by ranchers mistaking them for golden eagles, or killed by traps and poisons set for other predators.

Perhaps an even greater detriment to the bald eagle has been ranching's impact on Western waters. Because overgrazing has been the major cause of the destruction of more than half of the riparian areas in roughly half of the West, its impact on bald eagles has been immense. Their food supply of fish has been significantly diminished in some watersheds, eliminated from others, thereby reducing their numbers and effectively extirpating them from many areas. Also, many of the tall riparian trees in which they built their nests have been destroyed by floods, lowered water tables, and other harmful ranching effects, while new trees have not been allowed to replace them.

Other major detriments have been pesticides (DDT, especially) and toxic chemicals, indiscriminate shooting, logging and cutting of nest trees, and habitat encroachment. The aboriginal bald eagle population was once probably well over 1 million, but by the early 1900s it had become apparent that the bird was in serious trouble, especially in the lower 48. In 1940, realizing that the bald eagle must be protected if it was to survive, Congress passed the Bald Eagle Protection Act. The legislation made it illegal to kill, take, or possess a bald eagle or molest its nest.

Nevertheless, ranching and other causes of decline continued, and the bald eagle population fell to a low point of about 5500 individuals. In 1973, with the passage of the Endangered Species Act, our national symbol was placed on the federal Endangered Species list. According to FWS, protection and recovery efforts have since allowed the bald eagle population to increase to about 12,000 -- roughly 1% the aboriginal number, prompting FWS Director John Turner to unashamedly declare it "one of the great conservation success stories in America today." Most of these birds are in Alaska; they remain rare to uncommon in the West. Most Westerners have never seen a bald eagle in the wild.

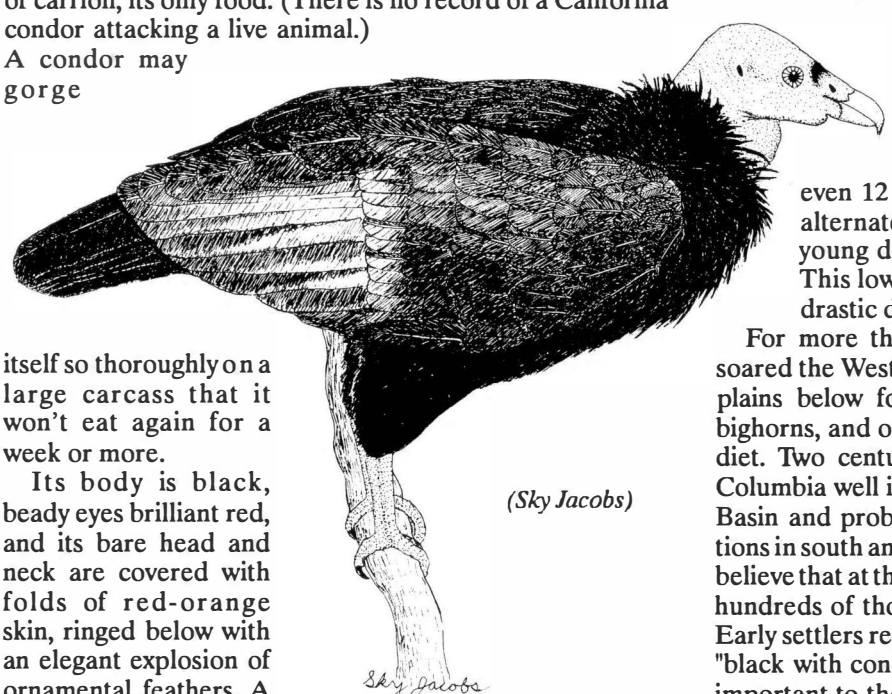
•California condor

The California condor, though not a predator, has been treated like one by the ranching establishment.

With a wingspan of 9'-11' and weight of 20-25 pounds, *Gymnogyps californianus* is the largest bird in North America, and, according to many experts, the largest (though not the heaviest) flying bird on Earth. *A flight feather may be 28" long!* But don't bother scanning the Western skies for this enormous bird; it is now extinct in the wild.

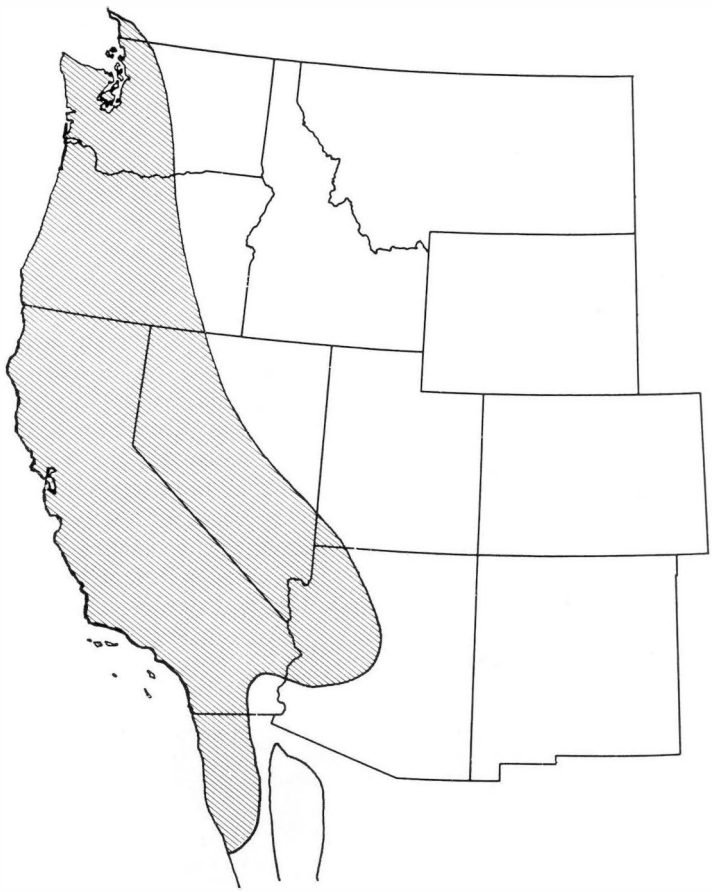
The great vulture is ugly to most humans, yet it is magnificent. It can soar for more than an hour without flapping its wings, and may fly more than 100 miles in a day in search of carrion, its only food. (There is no record of a California condor attacking a live animal.)

A condor may gorge itself so thoroughly on a large carcass that it won't eat again for a week or more.



(Sky Jacobs)

Its body is black, beady eyes brilliant red, and its bare head and neck are covered with folds of red-orange skin, ringed below with an elegant explosion of ornamental feathers. A band of white feathers crosses the back of each wing below the shoulder, and the underside of its immense wings are lined with large triangles of white.



POSSIBLE RANGE OF THE CALIFORNIA CONDOR, circa 1700

Some authorities believe wild condors lived to 75 or more years of age, often mating for life. They nested on remote cliff ledges or in large dead trees. The females don't lay their 4" long eggs until 5 or 6 or even 12 years of age, and then only 1 at a time on alternate years, or at even longer intervals. The young don't leave the nest until nearly a year old. This low reproduction rate helps explain the bird's drastic decline.

For more than a million years the California condor soared the Western skies, scanning the hills and valleys and plains below for the carcasses of deer, elk, pronghorn, bighorns, and other large animals that made up most of its diet. Two centuries ago it ranged from southern British Columbia well into Baja California and east into the Great Basin and probably Arizona, with the densest concentrations in south and central California, near the coast. Experts believe that at the onset of the European invasion there were hundreds of thousands of California condors in the West. Early settlers reported the skies in some areas were at times "black with condors." The gigantic bird was tremendously important to the religious reality of West Coast aboriginal

peoples, though, ironically, by collecting condors for ceremonial use they contributed to the bird's demise. (Smith 1978)

In contrast, early European settlers regarded the vulture as dirty, destructive, dangerous, an ill-omen, and a carrier of disease. According to Dick Smith in **Condor Journal**, "Many early settlers were convinced that condors attacked living cattle and sheep, carried off calves and lambs, even infants and small children." Early Spanish ranchers killed them often, as did the American stockmen and others who followed, sometimes "just for target practice." (Smith 1978)

As the abundant wildlife of the Pacific West was gradually replaced by livestock, and as habitat was impinged upon by ranches and farms, the California condor slid toward extinction. Yes, cows and sheep mostly replaced wildlife as a food source (95% of its diet during the last century was cattle, sheep, ground squirrels, deer, and horses, in that order), but the condor was used to finding plentiful carrion at all times of the year, not just when ranching allowed for it. Variations in ranching practices caused irregular annual and seasonal fluctuations in available carcasses, as did the long-term effect of massive livestock and wildlife die-offs caused by overgrazing and drought.

The condor was in trouble as early as the mid-1800s. In the 1880s, California even passed a bill outlawing the killing of condors. Few were aware of the law, however, and fewer still were inclined to obey it. In fact, though thousands of condors have been killed illegally, in all history there is only 1 record of someone being successfully prosecuted for killing a condor. That man was fined $50 in 1908. (McMillan 1968)

With the onset of the Gold Rush in 1849, a great number of condors were killed for their quills, which were in vogue for carrying gold dust. Many people shot them indiscriminately. Egg collectors took a heavy toll. By the turn of the century, most California condors were gone, and by mid-century most experts had given up the species as lost. In the mid-1900s, pesticides began to contaminate the bodies of the few remaining, while "progress" reared its ugly head and invaded the condor's habitat.

In recent decades, as modern ranching reduced livestock deaths, dead stock were removed from the range, and various dangerous substances were introduced into livestock, the already dubious substitute condor food source -- dead cows and sheep -- became increasingly inadequate. Olive Kingston Smith explains in **Condor Journal** that in the 1970s,

> *Do the* [condor] *flocks that forage the ranges of modern cattle ranches where herd animals are scientifically bred and fed reproduce? No one really knows, but many are beginning to question as Dick* [Smith, a condor expert] *did, whether this vaccinated, supplementally fed, and hormone injected food supply disrupts delicate mechanisms of the condor's breeding cycle.* (Smith 1978)

> *A sheep rancher, who killed two golden eagles in San Luis Obispo County about 1946, said he would shoot any condors which he saw near his sheep. He refused to be convinced that condors were not predatory.*
>
> --Carl Koford, **The California Condor**, in 1953

Ranching is the most pernicious, persistent factor in the California condor's decline. Stockmen, sheepmen especially, shot many, thinking them golden eagles, or because, as one writer put it, "they made almost irresistible targets." Some were killed in the massive rodent poisonings of the late 1800s and early 1900s. According to Oliver J. Austin, Jr. in **Birds of the World**, "Many were poisoned by strychnine which ranchers inserted into cattle to kill wolves and coyotes." In June 1941 a condor was found dead in a metal stock tank, presumably drowned. In the 1940s, when the condor population was estimated at about 100, there were several documented incidences of stockmen killing condors. In later years, ranchers using Compound 1080 against predators murdered others. Additionally, 10 condors -- about 1/4 the population at the time -- were found dead during 1080 squirrel poisoning in the 1960s. Six more were examined and discovered uninjured. How many flew away to die in solitude is unknown. In fact, there is considerable evidence showing that a large percentage of ranching-related condor deaths went undiscovered or unreported and, what's more, for decades government officials collaborated with ranchers to hide incriminating condor deaths. (Koford 1953, McMillan 1968, Smith 1978)

> *I doubt that any other region in the world has seen poison used so extensively, so effectively, or with as much ingenuity as in the range of the California Condor. . . . In my view, poison not only is a probable cause of condor decline but has undoubtedly caused serious and inexcusable losses.*
>
> --Ian McMillan, **Man and the California Condor** (McMillan 1968)

By 1967 the total number of known California condors was about 50; by the end of 1982 it was only 19. An M-44 coyote getter claimed one of these just before the last wild condors were taken into captivity. Of the last 3 wild condors, 1 died in a leghold trap.

As the big bird declined in recent years, various steps were taken to try to save it from extinction. Road kills and stillborn calves were left near where condors were known to live. The government enforced protection laws. Small portions of condor range were closed to public access, development, and mining -- though rarely to ranching. In the latter 1980s, in a desperate attempt to thwart extinction, the US Fish & Wildlife Service took all condor eggs from their nests and captured all wild condors. Several chicks have been reared in captivity, and all 40 of the Earth's largest flying birds now spend their days in cages at the San Diego and Los Angeles Zoos.

Little of the California condor's homeland is being protected from "progress" or ranching. Chances for the species' successful reintroduction and recovery in the wild seem slim.

• Raven

What? Ravens kill livestock!? Ranchers traditionally have shot ravens as vermin. Now, believe it or not, ravens have been added to their predator list. Maybe stockmen are simply running out of eligible predator enemies? Perhaps some drunken cowboys took Alfred Hitchcock's classic horror film *The Birds* too seriously?

(Roger Candee)

The common raven is one of the most familiar Western birds, and to those who know it well it is a wonderful animal. It is distinguished from crows by its voice, habit of soaring, and larger size, thicker bill, and wedge-shaped tail. Ravens are found throughout the West in an incredible variety of habitats, from the baking, 130 degree floor of Death Valley to the frosty shorelines of northern Cascade alpine lakes. Spirited birds, they ride the wind currents, skim along sheer cliff faces, speed across cliff tops out into the void above vast canyons, dive, climb, float, even play tag with one another as they soar about -- apparently for the sheer joy of it. Ravens are brilliant, omnivorous opportunist-scavengers, which largely explains why they have fared so well in the face of ranching and other human encroachment. Like vultures, they may feed on cattle and sheep carcasses.

At the request of ranchers, poison bait traps were set out [by ADC], *in an effort to stop ravens from striking young cattle. The ravens reportedly kill calves by poking their eyes out and harassing young animals until they bleed to death. Juve* [Director of Arizona ADC] *said the Flying M Ranch near Flagstaff reported that 16 calves were killed by ravens last winter.*
--Associated Press, June, 1989

. . . the ADC has been poisoning ravens on two Arizona cattle ranches for the past two years, and now pending is an application to poison ravens anywhere in the state "as needed." They have already sent forms out to cattlemen, polling them on the need to control these crazed killers. If this succeeds, their funding will increase by about 40%.
--naturalist/author Byrd Baylor in 3-20-88 *Arizona Republic*

According to a handful of ranchers, ravens have killed hundreds of their livestock in recent years. Probably the most vocal of these raven-haters is a wealthy former president of the Arizona Cattle Growers Association, public lands rancher Jack Metzger, promoted as one of the most environmentally enlightened ranchers in the state. (A day with him on his ranch showed me that this isn't much of a claim.) Under pressure from Metzger and other stockmen, ADC in Arizona and other Western states has begun to shoot ravens and poison them with starlacide-tainted beef and chicken eggs. For example, in 1988 in Nevada, government hunters shot 109 ravens blamed for taking "20 lambs, 2 calves, 50 hen eggs, and 25 golf balls (valued at $2 each)" (Satchell 1990). However, ranchers across the West discreetly dispatch thousands of ravens each year.

The graziers allege that flocks of these black devils (and magpies, in some areas) attack helpless calves and sheep, poke their eyes out, and ravage every external orifice until the animals bleed to death. Then the bloodthirsty demons descend upon the lifeless victims en masse and pick the bones clean. Non-ranchers have yet to witness the gruesome spectacle.

According to many experts, the stockmen's claims are false. In fact, rarely do ravens kill an animal larger than an insect. And a study by Dr. Bernd Heinrich of the University of Vermont shows that ravens are incapable of penetrating the hide of a calf or cow, much less of killing a cow or calf. According to a report on the study:

In order to observe raven activity, Heinrich set out calf carcasses to attract them. Until the carcasses were ripped open (either by Heinrich or coyotes), the ravens were unable to feast on the meat. They have neither the power nor the beak formation to pierce the hides.

In California, Arizona, and other Western states, it is illegal to kill a raven or to keep one as a pet, even an injured raven that would otherwise die in the wild. Penalties are stiff. Yet ranchers and government agents may massacre flocks of them.

A recent TV news show ran a story of a young local boy who found a crippled raven, nursed it to health, and kept it for years as a pet. The boy grew close to the bird and came

to love it as a brother. When Arizona Game & Fish officials found out, they invoked the law declaring raven possession illegal and confiscated the bird. The boy was heartbroken. But Game & Fish wasn't through; they then killed the bird because, they said, it couldn't be rehabilitated and released into the wild.

A controlled program to control predators is the best way I can imagine to have our natural environment adjusted by man to enhance his livelihood. The controls should not be just for predators, but for any effective means to enhance our subsistence . . . .

--John McRae, public lands rancher, Miles City, Montana

Besides all the foregoing, Western stockmen kill other animals as predators or suspected predators, or to protect livestock from injury. For example, many ranchers shoot ospreys, vultures, large hawks, and even owls, believing them eagles or other livestock predators. Some shoot or trap badgers, fishers, and wolverines because these animals may seem large enough and ferocious enough to kill or injure a calf or sheep.

The theory behind predator killing is still there: If you kill lots of predators, especially coyotes, foxes, mountain lions, bears, then cows and sheep can sleep in peace. It's time we recognize that this philosophy has never worked, and never will.

--Dick Randall (Pacelle 1988)

On January 15, 1980, one of the livestock industry's foremost representatives declared, "I would like to say as a sheep producer, I cannot accept any level of predation" (Malachowski 1988). In other words, he will not accept anything less than the government preventing ***all*** predation on his livestock.

"Reasonable" people say we need a "balanced" predator control program that "controls" predators enough to minimize stock losses but not so much that it harms the environment. This is not reasonable. It's like saying a reasonable approach to burglary is to allow the theft of only 3/4 of a person's belongings. Moreover, it has been shown that to maintain minimal predation levels, predator populations must also be kept to minimal levels -- small fractions of original densities -- so low, in fact, that often they are not able to maintain genetic health in the long run.

Janice Grauberger, a spokesperson for the National Woolgrowers' Association, stated in 1987 that "All that stockmen have ever asked for is that people take a common sense look at the reintroduction of wolves or the purposeful reintroduction of any predator where livestock are being raised." Well, I challenge anyone to find an area in the West large enough that wolves or any other large predator would have no contact with livestock, and large enough for that species to maintain a viable population. This country needs such places, but they do not exist. Even most Wilderness Areas are infested with cattle or sheep. Grauberger's words are simply empty rhetoric designed to make her business appear reasonable and placate opposition to predator slaughter.

Even if ranching did have an appropriate place in the West, which it does not, predation is a natural occurrence and anyone in the ranching business should be prepared to suffer livestock losses to predators, as herders historically have for thousands of years. If losses on an allotment are so great that a rancher simply cannot stay in business, then he should not be in business. This is something ranchers, government, and the public all must sooner or later realize.

By far the most vocal, vehement, and deadly enemy of Western predators has been and remains the public lands rancher. Yet, the total amount of meat from sheep and cattle killed by predators on public land each year would, if distributed evenly, provide each American only ***1/12 ounce*** (about the weight of a peanut) of mutton and beef (US government publications). Ranchers counter that without predator "control" keeping the predator population low the amount would be vastly higher. If this was true, then historical fluctuations in predator slaughter should reflect corresponding rises and falls in livestock predation. They don't.

The massive slaughter of predators in western states continues in an effort to protect the private interests of a few thousand cattle and sheep ranchers, with total disregard for both its cost to the nation's taxpayers and its impact on the nation's wildlife and public lands.

--Sava Malachowski, "Bloody Shame" (Malachowski 1988)

I'm sick of hearing about the slaughter of mountain lions, bears and wolves, and having to listen to John Wayne wannabes mewling about their property rights. . . . Ranchers are just going to have to accept the fact that certain natural hazards go along with driving cows on public land. Among those are gopher holes, lightning strikes, rattlesnakes, flash floods and, yes, predators. . . . I object to the wholesale slaughter of the public's wildlife so that a few dozen ranchers can sustain an uneconomical "lifestyle" that became an anachronism 50 years ago.

--Richard Lessner, "Dancing With Wolves: Ranchers Should Lose This War" (Lessner 1991)

Competitors

"Competitor" is a term not often used by stockmen or their government bureaucracies, but it accurately describes the industry's attitude and activities relative to many wild animals. A *competitor* may be defined as any wild or feral animal that normally eats significant amounts of what livestock might eat. This definition would include a great number of species the ranching establishment usually calls "pests," and there is often a fine line between the two. This section, however, will focus on those animals more conventionally regarded as competitors -- mainly the large herbivores. (See next section for "pests.")

> *Since bison, deer, elk, and antelope competed with domestic cattle and sheep for the grazing lands, it was axiomatic that these wild grazers had to be eliminated or at least reduced in numbers to the point where they no longer posed a major threat to livestock. Accordingly, ranchers, aided by Indians and contract hunters, launched a concerted campaign on the grazing mammals, and by the end of the nineteenth century, deer, antelope, elk, and bison were nearly exterminated, with only small herds scattered over what was once a very large range.*
> --J.J. McCoy, **Wild Enemies** (McCoy 1974)

A century ago ranching, and later other human exploitation, hit Western wildlife like a nuclear bomb. Millions of large herbivores were slaughtered and replaced by livestock. Overgrazing depleted the food supply and ravaged the habitats of those that remained. Many fell to introduced disease and parasites. Within a few decades, many species survived only as tattered remnants of their former populations.

Overall, the 1920s were a low point. After that, abandonment of thousands of small homesteads, efforts to mitigate ranching impacts, increased concern for wildlife, tighter "game" restrictions, restoration programs, and the creation of National Parks and National Wildlife Refuges all began to reverse the trend. Since then, populations of most large herbivores have rebounded somewhat, though they are still only small fractions of their original numbers. Populations of others, including many predators and small animals, continue to decline.

Today, livestock grazing and related activities remain the major factors preventing wildlife recovery on Western public land. In this way, without having to fire a shot, the ranching establishment eliminates most competitors from most areas or pushes them into areas not well suited to livestock (or most wildlife either, unfortunately). Yet, even

(Photo courtesy of Steve Johnson)

today's relatively tiny wild large herbivore populations are unacceptable to stockmen striving to **minimize** competition. Stockmen continue to intentionally kill wild competitors, and their government agencies continue to give livestock overwhelming priority in management plans. Thanks more to ranching than any other factor, it is possible to walk for days across public land and never see a large native herbivore other than an occasional deer.

> *They call them "mammal control agents." . . . And I could tell you how the sheepmen shoot game animals, deer and antelope by the hundreds and treat them with poison of their own. I know where there are 14 deer baits right now . . . . It would make your hair stand on end, all the things I really have seen.*
> --Dr. Stanley A. Cain, Assistant Secretary of the Interior for Fish and Wildlife, in a statement to a Congressional subcommittee in 1966

Pronghorn on cattle-grazed Wyoming range. *(George Robbins Photo, Jackson, WY.)*

•Deer

A mule deer on healthy range not used by livestock. *(George Robbins Photo, Jackson, WY)*

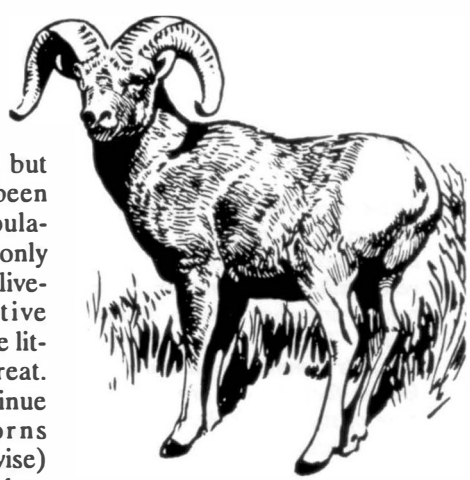
Because deer are (now) primarily browsers, stockmen are less prone to think of them as competitors. This is another reason deer numbers remained comparatively high while other "big game" species plummeted. Nonetheless, overgrazed ranges may have a 35% to 60% dietary overlap between cattle and deer, and even greater competition between sheep and deer. Heavy goat grazing (which is gaining popularity) can virtually ruin a range for deer. Thus, many ranchers shoot deer regularly, allegedly for sport or venison, but often as much or more to reduce competition. Because deer hunting is one of this country's favorite outdoor activities, few people question ranchers' motives.

•Pronghorn

On lightly grazed ranges, competition between cattle and pronghorn usually is no more than 15% of their diets, but on heavily grazed ranges competition can be significant. Sheep and pronghorn normally have a 40% dietary overlap; and, as mentioned, overgrazing on sheep ranges can create serious competition. Damage claims for lost herbage awarded ranchers by the state of Colorado are figured on the basis of 13 pronghorn equalling 1 cow.

To the partial credit of some of the more enlightened private lands ranchers, pronghorn have been tolerated, or even encouraged (nearly always as a "big game" species) in recent years and have increased in numbers on some private rangelands, especially in Wyoming. Public lands ranchers, however, have not been so generous; their opposition keeps pronghorn numbers relatively low. They shoot pronghorn discreetly as competitors or ostensibly for sport, on private or public land. With government help, they organize special "damage control" hunts to bring pronghorn numbers down to "acceptable" tiny levels. They compel Western state game and fish departments to trap and relocate "problem" pronghorn. More than any other group, they pressure states and federal agencies to maintain population ceilings which keep pronghorn at only small fractions of aboriginal numbers. On Montana's Charles M. Russell National Wildlife Refuge, it took a federal court ruling against livestock operators to uphold the right of the Refuge to allot more herbage to pronghorn and other wildlife than to the permittees' cattle. Nearly all pronghorn range in the West is used for livestock ranching.

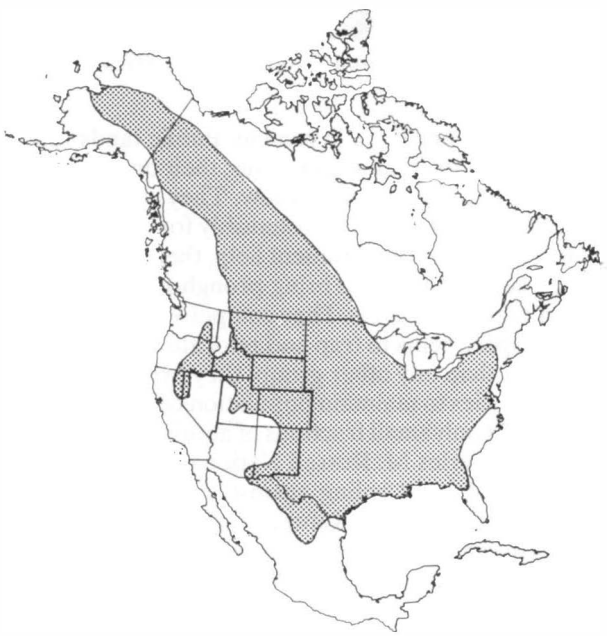
•Bighorn



Bighorns eat many of the same foods as cattle and sheep, but because they have been reduced to tiny populations that survive only in remote, rugged, livestock-unproductive locations, they pose little competitive threat. Yet stockmen continue to shoot bighorns (legally or otherwise) as competitors and to oppose recovery and reintroduction efforts. In recent years, they have even gone to court to block bighorn reintroductions. In one case, livestock interests pressured a court to forbid BLM to transplant 18 bighorns onto BLM land in Big Jacks Creek Canyon in Owyhee County, Idaho (where they had been extirpated by ranching long before) unless the Idaho Department of Fish & Game first administered vaccines to the animals and checked them for disease and

parasites that might affect livestock. All parties complied. Stockmen in some Western states are pressuring state game and fish departments to require veterinarians to inspect, treat, and certify as disease-free all transplanted wildlife -- an economic impracticality that would effectively end many recovery efforts. The public might reasonably ask why an area's cattle and sheep are not required to be checked and vaccinated at stockmen's expense to protect transplanted wild animals.

• Buffalo



APPROXIMATE PRE-EUROPEAN PRIMARY BUFFALO RANGE

Buffalo on average are half again as big as cattle, are much stronger, more agile and intelligent. They can push over or through most livestock fences. They are (were) the cow's premier forage competitor. Thus, the Western stockman fears the free-roaming buffalo as much as the wild wolf. A large percentage of the variously estimated 40-75 million buffalo massacred (hundreds of millions, altogether, including progeny) a century ago were slaughtered to make room for cattle. Competing, disease-carrying livestock destroyed many. And ranchers have continued to slaughter buffalo ever since.

Though early ranchers helped push the unfortunate animal nearly to extinction, contemporary stockmen have not relented; most of them vehemently resist buffalo recovery or reintroduction proposals. For example, south-central Wyoming's Red Desert, last home of free-ranging buffalo in this country and even today one of the largest unfenced tracts of land in the lower 48 states, is considered a prime reintroduction site. Local ranchers oppose a proposal to transplant "surplus" buffalo from northwest Wyoming's National Elk Refuge to the Red Desert, ostensibly because buffalo will spread brucellosis to their cattle, and, according to Leonard Hay, a member of the Rock Springs Grazing Association's board of directors, because "Bison will compete with livestock for forage, particularly winter range forage." Local BLM officials say there is enough forage for both the cattle and a token number of buffalo. A past president of the Wyoming Wildlife Federation, Ron Smith, points out that buffalo can simply be inoculated against brucellosis before being transplanted (inoculation is considered 70%-90% effective). But the transplant is unlikely. Again, why shouldn't the cattle be removed from Red Desert BLM land and replaced with buffalo?

Yellowstone National Park harbors one of the world's largest "free-roaming" buffalo populations -- currently about 2200 animals altogether. The Park's northern herd of approximately 1000 had in recent years been expanding northward into historic wintering habitat in the Yellowstone River Valley in Montana. As usual, most of the valley is owned and/or grazed by stockmen.

These men [buffalo hunters] *have done in the last two years, and will do in the next year, more to settle the vexed Indian question than the entire regular army has done in the last 30 years. They are destroying the Indian's commissary; and it is a well known fact that an army losing its base of supplies is placed at a great disadvantage. Send them powder and lead, if you will; but, for the sake of lasting peace, let them kill, skin, and sell until the buffalos are exterminated. Then your prairies can be covered with speckled cattle and the festive cowboy, who follows the hunter as a second forerunner of an advanced civilization.*

--US Army General Sheridan, 1870s

Ranchers shot some of the Yellowstone buffalo as they ventured beyond the Park's northern boundary into the Land of Bovine. The Park Service attempted to drive them back into the Park with trucks, helicopters, rubber bullets, cattle grates, and loud noise. On April 19, 1985, the Governor of Montana signed HB 763, which allows the hunting of any buffalo that wanders out of Yellowstone National Park. The Park Service considered other alternatives and finally decided to build a 6-mile-long, 6-foot-high, heavy-duty woven wire fence to block the buffalo's movement out of the Park. The fence cost half a million dollars, blocked elk migration, and created an eyesore in the National Park. It was only partially effective. Over half of Yellowstone's northern herd -- at least 569 animals -- were shot in the winter-spring of 1988-89. Reportedly, only 4 were killed during the 1989-90 season, but government officials predict hundreds will be killed in coming years.

In 1990, eighty miles south in Wyoming, ranchers have pressured the state to allow for the first time hunters to kill 20 bison straying from Grand Teton National Park and the National Elk Refuge (see Wuerthner 1990). In southeast Utah's Henry Mountains, drought and overgrazing -- by far mostly by cattle -- recently induced the state Division of Wildlife Resources to issue 115 special buffalo hunting permits -- in addition to the usual 65 -- to minimize competition with livestock.

Ranchers next to or near some buffalo reserves are pushing for the slaughter of these few remaining behemoths under the premise that they spread brucellosis to cattle -- this, despite evidence that, "no cases have surfaced in which cows have been infected [with brucellosis] from bison" (*E* magazine, May/June 1990). Experts say that *cattle* spread this disease -- to each other and to wild animals. At Yellowstone, where the brucellosis argument is being used, almost all cattle have been inoculated against the disease.

The Parker Land and Cattle Co. of Dubois in northwest Wyoming recently filed a damage claim for over $1.1 million (the state's largest ever) against Wyoming Game & Fish, Grand Teton National Park, BLM, FS, and FWS. The company contends that the agencies are to blame for the ranch's cattle herd contacting brucellosis from either buffalo or elk, leading to the quarantine and mandatory slaughter, sterilization, or castration of its entire 622 head cow/calf herd -- this, despite a statement by the Wyoming state veterinarian that there is no proof the cattle contacted the disease from wildlife. The Parker Company, like many other ranches, is demanding stepped-up wildlife vaccination against brucellosis and the immediate slaughter of any wild animals even remotely suspected of carrying the disease. (Rancher-oriented Western Congressmen currently are backing legislation introduced by Sen. Conrad Burns of Montana that would force the federal government to pay ranchers for testing cattle that were "exposed" to brucellosis by wildlife in the area.)

Imagine not that the bison are invading the ranches, but that the ranchers' cattle are occupying the bison's ancient turf.
--Mike Bader, Alliance for the Wild Rockies

•Elk

Concerning Elk. They are very destructive animals.
--Hubert Lauzon, public lands rancher

Elk average almost as much as cattle in weight and eat many of the same plants (though 1/3 to 1/2 as much); thus, they are formidable competitors. Dietary overlap may be 50% or higher, and on badly overgrazed winter ranges elk may starve while cattle usually munch hay. Elk may also damage fences and in winter abandon livestock-overgrazed ranges in favor of private pastures and feed supplies. Modern elk generally keep to high elevations and stay near the cover of forests, but few elk ranges are not also used by livestock. Elk and livestock do not mix well, and since livestock arrived in the West elk have been getting the worst of it. Ranchers long ago fenced elk out of most of their natural ranges and relegated them to a marginal existence on less favorable lands -- what now mostly comprise public lands. But because elk travel much farther from water than do cattle, the construction of many new stock tanks has allowed cattle to invade much of this formerly inaccessible elk habitat.

An elk in an autumn meadow during rut.*(George Wuerthner)*

Probably no other wild competitor stirs such violent opposition in ranchers as elk. Since the 1800s many stockmen have routinely shot elk to give their cattle more to eat, often

under the protective banner of "hunting." Elk hunters are a powerful special interest in the West; but, ironically, their traditional "hunter/cowboy camaraderie" has been a major factor in keeping elk numbers low. In recent years, some of the more enlightened elk hunters have challenged stockmen's efforts to prevent elk recovery, though with only limited success. Detailed below are a few of the livestock/elk conflicts raging around the West.

In Arizona (and New Mexico), the largest of all elk, the now-extinct Merriam's elk, has been replaced with other subspecies, which now number perhaps 20,000 and survive only in the east-central to north-central forests of the state. In the 1950s, ranchers' complaints led the state Game & Fish Department to "shoot the heck out of the elk herd," but in recent years elk hunters have fought back, and a major confrontation is brewing. Ranchers claim that elk overgraze winter ranges, damage fences, and eat their hay and salt blocks. In fact, an Arizona Cattle Growers questionnaire returned from 40 of 147 area permittees shows: (1) an average of 473 elk per ranch/allotment, which, if representative of the other 107 permittees, would total 70,000 elk -- 10 times more elk than exist in that area!, (2) an elk salt use of *6 tons* per ranch, (3) the presence of elk is (suddenly) the worst of their ranching problems, followed by dense tree growth, hunters, vandalism, and predators, (4) an average hay damage of $1100 per ranch, and (5) elk depletion of 69% of the grass and 31% of the browse on their allotments! Steve Gallizioli, Vice President of the Arizona Wildlife Federation, took a cattlemen-sponsored tour to witness the elk devastation. He reports:

> *It was billed as a tour to show everyone the magnitude of the "elk problem" on the Apache-Sitgreaves National Forest. . . . We saw nothing to substantiate what he* [local rancher] *said about numbers of elk and their predations. Ironically the only evidence we actually saw which indicated there had been too many animals on the area was a forest allotment overgrazed by cattle. A swarm of locusts couldn't have done a better job on the area.*

Hunters claim that cattle, which account for at least 12 times as many AUMs in the area, are doing the overgrazing and should be reduced on public land. It is a common conflict, this struggle over "natural resources" -- the ranchers historically in control, the hunters demanding their slice of Nature's pie. According to an article in an area newspaper, "When it came to actually making formal suggestions on what big game policies and regulations ought to be changed this coming year, the proposals from the ranchers present all had one aim -- drastically reducing elk herds." A recent statement by a spokesman for Arizona stockmen demanded that the state's elk population be immediately reduced by 61%. He also wanted Arizona Game & Fish to be held liable for any elk impacts on ranchers' private or public land ranching operations, and demanded that ranchers be given a portion of the state's revenues from sales of big game hunting permits and tags. Hunting and bag limits were to be set in accord with ranchers' desires, and the Arizona Game & Fish Commission was to be appointed to include at least half livestock interests. Both ranchers and hunters agree there should be more range "improvements."

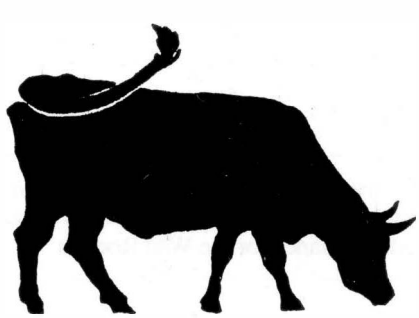
In Arizona's Prescott National Forest, Mike Oden, a public lands ranching permittee, recently pled guilty to illegally killing 6 elk. Investigators believe 11 and as many as 20 may have been shot -- 1/3 of the area's elk herd. Some of the animals were probably "gut shot" -- that is, purposefully shot in the stomach or intestines and allowed to wander far away from the scene of the crime to die slowly from infection or other complications. According to the Arizona Game & Fish Department in their Nov. 15, 1989, *Wildlife Newsletter*, "Oden reportedly shot or ordered his employees to shoot as many elk as possible because he believed they were competing with his cattle and feared their presence might cause the U.S. Forest Service to reduce his grazing permits . . . ."

In Utah in the early 1900s, pressure from stockmen prompted the state to establish the Board of Elk Control, which, along with attrition from ranchers and others, nearly extirpated the animal from the state. In southeast Utah in 1988, a handful of public lands ranchers hired a powerful range consultant firm to block an attempt by the Forest Service to reintroduce elk onto their historic range in the Manti-LaSal National Forest. After subjecting government agencies and numerous groups and individuals to a lengthy battle, their appeal was recently denied. FS reintroduction plans (along with various appeasements to local stockmen) are scheduled to proceed, though it remains to be seen if these elk will survive covert "lead poisoning" promised by ranchers.

In northeast Nevada, another proposal to reintroduce elk -- into Nevada's largest and best elk habitat -- was dropped in 1985 after 13 years of planning. Under pressure from a handful of stockmen (including a past president of the National Cattlemen's Association) and the ever-pro-ranching Nevada legislators, the Nevada Department of Fish & Wildlife abandoned its reintroduction plans. According to a local newspaper, "Nevada legislators were rumored to have threatened the Nevada Department of Fish & Wildlife with reprisals if the reintroduction occurred."

Elk once were abundant in northeast Nevada and southwest Idaho, but livestock grazing and extermination by local ranchers 20 to 30 years ago have destroyed the area's elk, except for a herd of 30 in a remote area of Owyhee County, Idaho. Nevada DF&W studies show that at least 400 elk could live in the area without significantly affecting ranching, that these elk would equal or exceed the economic value of area livestock while consuming less forage, and that rancher use of BLM lands (most of the area is BLM land) contributed only 0.26% to the total income of 3 area "cow counties."

As with so many other animals, the most persistent, deadly influence on elk is ranching.



•Horse

Unfortunately, in the age of fence-wrapped Western horizons, docile dehorned cattle, and wranglers riding the range in Hondas, this born-free outlaw image of the wild horse is as outdated as the Conestoga wagon and the Colt .45.
--US News and World Report (3-2-87) (Satchell 1987)

Are the West's free-roaming horses and burros wild or feral? Do they have a place on public land? If so, where and how many? Should they be allowed to occupy their entire range or be limited to certain areas? These are sticky questions, and people have many varying and often emotional answers. Each person must make up his or her own mind based on consideration of environmental and other impacts, knowledge of the animals, and intuition.

Technically, they probably are feral animals, having descended from escaped domestic stock. However, fossil evidence indicates that some species of horse evolved on the North American continent perhaps 60 million years ago and disappeared only about 7000 years ago -- probably due largely to attrition by humans. Some evidence suggests that vestigial populations may have survived up until 3000 or even 1000 years ago. Equines are therefore much better adapted to North American ecosystems than are cattle or domestic sheep. This is a main reason horses took so readily to the West when the Spanish reintroduced(?) them to the continent in the 16th century.

Strays from Spanish missions and settlements formed wild bands and spread quickly across the West. Native Americans captured and tamed many of these. History books notwithstanding, other than introduced disease the use of horses was probably the greatest contributor to the downfall of indigenous Americans in the West in the 17th, 18th, and early 19th centuries. With the horse, they could travel great distances much more quickly and carry (therefore own) many more possessions, thus radically altering the ways of life that had served them well for millennia. They were able to slaughter many more large game animals than they could eat or use. Horses in domesticated, sedentary herds ate crops and overgrazed surrounding areas, destroying plants and small animals used for food and other necessities. With the horse, Native Americans were able to invade each others' homelands and wage war as never before. Thus, the warring, nomadic Native Americans that Euro-Americans met when they came West in the mid-1800s were already vastly changed from a century or two before. (Malin 1956; White 1983) (Historically, livestock domestication fostered the rise of many aggressive civilizations; for example, domestication of the alpaca and llama was a major factor in the rise of the conquering Incas in South America.)

By the end of the 18th century, horses, also called mustangs, roamed about half of the continent and numbered an estimated 2 to 10 million individuals. This population level continued until the livestock invasion of the mid-19th century. Evidence indicates that during this period the horses of North America filled "their" habitat and reached a relatively stable population. Overgrazing was a minimal problem until the introduction of huge numbers of cattle and, later, sheep.

By 1812, escaped horses were so numerous in the San Joaquin and Sacramento Valleys that they were robbing the cattle of grass. That year, the Spanish claim to have hunted and slaughtered 30,000 feral horses.
--from The Wild Horse in Nevada, edited by Cheryl A. Young (Young 1985)

To clear the way for cattle and help destroy "the Indian menace," white invaders slaughtered not only the buffalo and "redskins" themselves, but the horses they had come to depend on. During the late 1800s, millions of horses were shot, poisoned at water holes, and driven over cliffs. In California, for example, to increase cattle forage, early Spanish ranchers drove thousands of horses over cliffs or into the sea (McNamee 1985). Thousands more were shot for target practice or sport. As the incoming hordes of cattle were given the advantage and began seriously overgrazing the range, horses found it more difficult to survive and reproduce, further reducing their numbers. Introduced disease took a toll.

Early Western newspapers contain many accounts of mass slaughters of hundreds or thousands of horses to keep them from competing with cattle, such as this from a Nevada newspaper: "Nine wild horses are all that remain now of a band of nearly 2,000 of the fleet-footed animals that romped over the hills and valleys of the Toiyabe National Forest three years ago and these nine are due to be exterminated if federal hunters and livestock owners can get within rifle shot of them . . ." (Young 1985)

Augmenting the overgrazing, introduced disease, and relentless attrition by the ranching industry, commercial "mustanging" became a booming business in the early 1900s. Mustangers, working independently, paid private and government bounties, or hired by stockmen, rounded up millions of horses and sold them as work or saddle animals or to slaughter houses where they were processed for pet food, chicken feed, fertilizer, and glue. Methods of capture included: roping; roping a tire to horses' necks to eventually wear them down; "creasing," whereby a rifleman would attempt to graze the spinal nerve on top of the neck to incapacitate the animals; "walk down," where 2 or more riders working in relays would follow a band for days until the horses became too tired, footsore, or indifferent to resist the riders (sometimes "running them down until their legs became bloody stumps"); and "corralling," in which men on horseback, in vehicles, or (later) in aircraft drove a band up against fences or canvas walls and funnelled them into a corral, or trapped them in a narrow, steep-walled canyon. (Young 1985)

Additionally, many thousands of horses on public land were captured by ranchers and used as saddle stock and draft animals. Compensating for this somewhat, horses abandoned by or escaping from ranchers joined or formed wild bands; thus, ironically, stockmen are partly responsible for their own "horse problem." Because of this, and subsequent hybridization, few free-roaming horses still have much original Spanish blood.

Actually, they ["wild" horses] *were inbred, puny and worthless equine wraiths that stole the feed from valuable animals* [commercial livestock]. *They were a scourge on the range and*

strong sentiment developed to get rid of them.
--Paul H. Roberts, former Forest Service official, **Hoof Prints on Forest Ranges** (Roberts 1963)

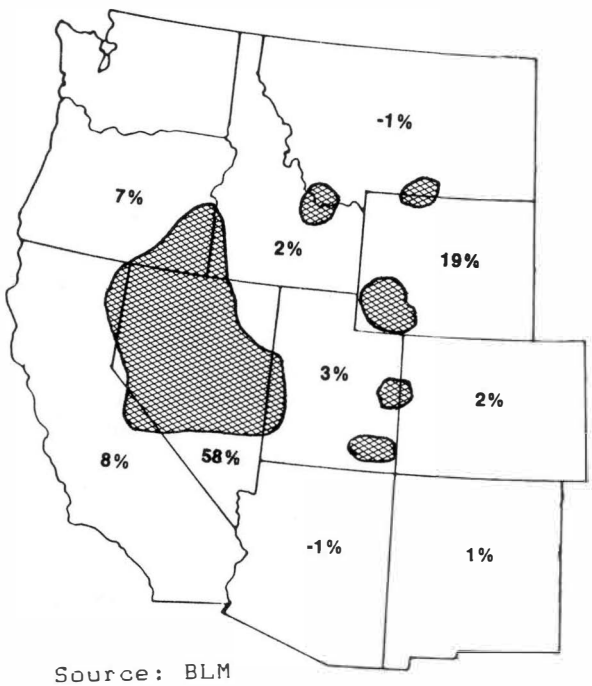
It's really a matter of greed. The cattlemen pay ridiculously low grazing fees, and now they're afraid that the horses are going to spoil their little game.
--Hope Ryden, author, widely considered the foremost authority on free-roaming horses

The Taylor Grazing Act of 1934 gave the ranching industry added organization to and the government the means to destroy free-roaming horses. By the 1940s the horse population was so low that people began to worry (or *hope*, in the case of most stockmen) that free-ranging horses would be extirpated completely from the West. Some demanded federal protection. Foremost among these was Velma Johnston, who later came to be known as "Wild Horse Annie." In 1950 Annie began an energetic campaign for legislative protection, which in 1959 resulted in passage of Public Law 86-234, known as the "Wild Horse Annie Act." This act outlawed the use of motor vehicles and aircraft and the poisoning of water holes for capturing or killing horses. It helped slow the slaughter, but was difficult to enforce. By 1970 the US free-roaming horse population had dropped to a low of about 17,000.

I am especially angry at the BLM and Forest Service because I have been a member of the International Society for the Protection of Mustangs and Burros since its inception. My friend, "Wild Horse Annie" Johnston was the president. The ranchers in Reno, Nevada, burned her in effigy because of her efforts on behalf of these animals.
--Rosemary Henry, Pinyon Hills, California, personal correspondence

The continuing lobbying efforts and letter writing campaigns of concerned groups (and thousands of school children) during the 1960s finally culminated with the passage of the Wild Free-roaming Horse and Burro Act of 1971, which outlawed killing, capturing, or harming the animals without government authority. This Congressional act stated that horses and burros were "fast disappearing from the American scene" and called for "protection, management, and control" of animals described as "living symbols of the historic and pioneer spirit of the West" (ironically, about the same words sometimes used in Congress to describe public lands ranchers -- those people who have killed more horses than any other). With the added protection of the 1971 act, the "wild" horse and burro population rose quickly and reached roughly 50,000 in 1976, and perhaps as high as 70,000 in the early 1980s. *But . . .*

As soon as the horse population began to rise, stockmen once again put the screws to the BLM. Under authority of the 1971 act, BLM in 1973 began identifying free-roaming horse and burro "herd management areas" and setting limits on how many mustangs or burros each area would be allowed "*based on availability of resources*." With the sneaky rhetoric, these limits were based overwhelmingly on projected competition with cattle and sheep. In 1988, BLM stated that "the appropriate management level Bureauwide is expected to be approximately 31,000 wild horses and burros" (USDI, BLM 1988). Also that year, the Forest Service estimated that "1,225 wild horses and 350 wild burros are the appropriate management levels" for FS land (USDA, FS 1988). In other words, the federal government claims that Western lands once supporting millions of horses (an estimated 1 million in Nevada alone) and burros can now support only about 32,600.



The intent of Congress is to preserve some symbols, not expand the herds.
--John Boyles, chief of BLM's Wild Horse Bureau (Satchell 1987)

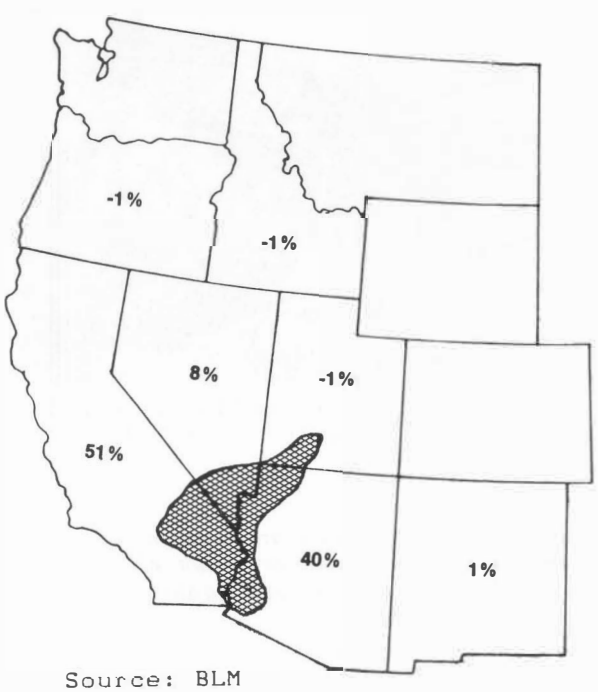
BLM determines the status of each management area's free-roaming horses and burros yearly. Old, sick, and lame animals (or those claimed to be) may be killed. Thousands of "surplus" horses and burros are captured, usually with helicopters, and trucked to corrals. There they are processed and offered for adoption (generally, a 4-per-year limit) to anyone who pays the adoption fee and maintains the animals for 1 year. All adopted animals are supposed to go to good homes, but many wind up being abused, butchered and fed to pets, or sold for slaughter, to rodeos, etc.

A federal court of appeals in San Francisco recently stated BLM's "adopt-a-horse" program was a "farce" because it failed to screen out commercial interests. The court ruled that BLM is prohibited from transferring title to federal free-roaming horses or burros to anyone known to use the animals for commercial exploitation. BLM itself admitted that several thousand horses taken under large-scale adoptions have been sold for slaughter, and that thousands of others have been sold or abused. A 1990 GAO

report affirms that at least 4000 were sold for slaughter from 1985 through 1988 by horse traders who took advantage of the program, and that the same fate probably met most of the 16,000 other horses given away through one part of the program. The report indicated that thousands more were illegally sold and cruelly mistreated, that BLM knowingly gave horses to commercial interests, that there is little evidence of horses overgrazing federal lands, and that ranchers have been allowed to increase cattle numbers on some allotments after horses have been removed, concluding, according to Knight-Ridder Newspapers, that the adoption "program has been run largely to satisfy ranchers who graze cattle on the land."

Since 1973, about 100,000 horses and burros have been taken from the range and "adopted." But, the adoption market is now saturated, and more than 10,000 animals are being held in federal corrals (some for 4 years), where, according to many sources, food, treatment, and conditions in general are poor. Each year thousands more are born on the open range and thousands more are captured and added to the already overflowing corrals. (BLM claims a natural "wild" horse population increase of 25% per year, though a 1982 study by the National Academy of Sciences concluded that the rate is 10% or less.) BLM, rather than reducing cattle numbers, has proposed that these "unadoptable" thousands be killed or auctioned off *en masse*. A growing number of people say BLM is purposefully rounding up far more horses and burros than it can accommodate so as to make slaughter or auction to large-scale commercial interests seem like the only alternatives.

Leaving no stone unturned, BLM has for years been funding research for fertility control and genetic manipulation to reduce horse numbers. Some horses already have been implanted with contraceptive drugs. Naturalists and others express concerns over how this interference may affect the animals' behavior, physical health, and gene pool.



Source: BLM

% - Percentage of Total Population Major Burro Area

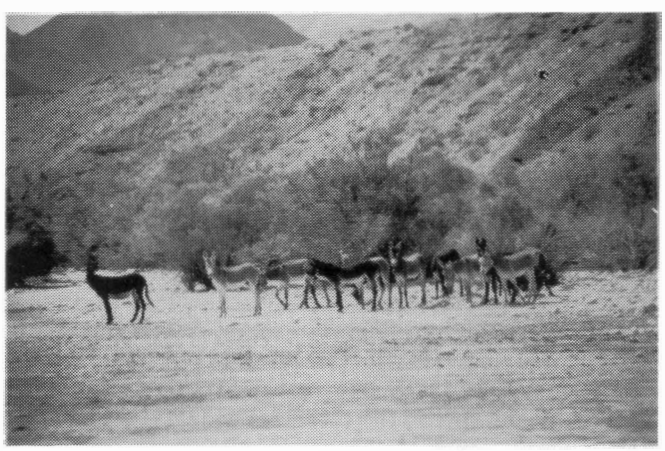
•Burro

Burros were used as pack animals by early prospectors and shepherds because they could travel long distances and subsist on desert vegetation. Some were later abandoned in favor of newer forms of transportation. Others escaped to the open range. They survived and prospered in the low deserts of southeastern California, western Arizona, extreme southern Nevada, and extreme southwestern Utah.

Burro range is generally unproductive for cattle, though most is grazed by cattle nonetheless; parts of it are too barren and dry for even stockmen to utilize. Thus, as competitors burros are somewhat less persecuted by the grazing industry than are horses. They are killed in some areas, however; for example, the carcasses of at least 51 burros were recently found on cattle range in Mojave County, Arizona, probably killed by local ranchers.

Free-ranging burros have damaged some parts of their fragile, hot desert range, especially near water, though damage generally has been less than that from cattle. To protect the environment, burros have been removed from the Grand Canyon, most of Death Valley, and some other areas. To protect livestock interests, they have been removed from many other areas.

Today, thousands of burros also await adoption in BLM corrals. The free-roaming burro population has declined greatly in recent years and now stands at less than 5000. The government plans further reductions.



Feral burros in lower elevation Mojave Desert, California.

[Stockmen] *are very disturbed that the BLM cannot seem to do what Congress told it to do, which is manage the numbers of wild horses. When there's not enough forage to go around, it's always the livestock that gets cut.*

--Deloyd Satterthwaite, Nevada Cattlemen's Association president, 10-21-89 *Arizona Republic*

Stockmen generally support BLM's program to clear the range of horses and burros. But many of them think BLM isn't doing enough. In other words, horses are still getting some of "their" forage. Since the 1971 act stockmen, their legal representatives, and the state of Nevada have filed a number of lawsuits against BLM to force it to further reduce horse numbers; Nevada, for instance, wants a 10,000 head

ceiling in the state (USDI, BLM and USDA, FS 1980). For example, Nevada rancher Joe Fallini recently won a court decision forcing the federal government to remove 1100 (all but 150) horses from the allotment he grazes cattle on. Of "his" *700,000-acre* "ranch" -- *98% of which is public land* -- Joe says, "I call it split-estate land. The public owns certain rights, and we have a certain possessitory interest through use." In some Western states, the courts have even ordered BLM to remove free-ranging horses from *private* ranchland, essentially at the owners' request.

Pro-horse groups have filed a similar number of lawsuits to force BLM to halt various roundups, treat captured animals humanely, and screen potential adopters. In all, more than 20 lawsuits have been filed since the inception of the 1971 Wild Free-roaming Horse and Burro Act, with the ranching industry prevailing in most cases.

Also since the 1971 act, BLM has investigated *hundreds* of cases involving harassment, illegal capture, or killing of free-roaming horses and burros on public land. The agency acknowledges that detection and prevention of these activities is "difficult." In other words, the ranchers' war against the horse continues unabated.

Perhaps the most prominent example is the recent discovery of scattered remains of hundreds of horses on remote BLM land in central Nevada. In August 1988, a charter helicopter pilot spotted the sprawled bodies of many horses on the slopes and in the washes near a spring. He notified BLM, whose investigators found 41 dead horses. Subsequent searches of the general area turned up groups of horse remains in various locations, which 2 months later totaled 451 bodies over 160 square miles of rangeland. All had been shot. Continued searching has so far revealed the bodies and bones of a total of 524. Some estimates place the number at around 1000. Many, perhaps most, will never be found. Undoubtedly, BLM could expand the search indefinitely and discover slaughtered horses throughout its 75,000 square miles of horse range in the West. (Even more recently, an Arizona newspaper reported that as many as 400 horses and *200 deer* were killed near the new Great Basin National Park in east-central Nevada, "allegedly by the employees of ranchers seeking to protect *their* grazing land . . ." [*Tucson Citizen*, 6-9-89 (emphasis added)]. Said undersheriff Harry Collins, "They shot them in the stomach, so these animals would wander" and take hours to die and spread the carcasses widely.)

The appalling discovery in central Nevada touched off a rare but brief public outcry, nationally broadcast TV programs, magazine articles, and a widespread demand for action. BLM launched an extensive investigation. In a *People* magazine article (Brower 1988), Nevada BLM chief investigator Len Sims stated, "People know who did it, but they are reluctant to talk to me. They say they don't want to get killed." A local former mustanger, Jimmy Williams, seemed to confirm this when he confided, "I don't want my bones bleaching out there." Sims also "watches his backside" these days.

Of the killings, BLM spokesperson Bob Stewart said, "The carnage that occurred out there was terrible, almost unbelievable." But Art Bergonzoni, son of a local public lands rancher, begs to differ. In an Austin, Nevada, saloon, he thundered at the *People* reporter, "They should shoot every damned one of them! They eat all the grass! The taxpayers is paying for them suckers and what good is they?" Outside the saloon, another public lands rancher snapped, "Whoever is killing those horses should get a medal."

Denying industry involvement, Nevada Cattlemen's Association president Deloyd Satterthwaite said he "cannot believe" that ranchers committed such atrocities, while NCA spokesperson Vickie Turner declared, "There are too many horses out there, but ranchers aren't killing them." Soon thereafter, a federal grand jury indicted 5 area cowboys for killing some of the horses (though as usual none were convicted).

This particular horse slaughter is unusual only in the large number of horses killed at one time and in having been discovered and revealed to a large segment of the public. According to Jimmy Williams, "The ranchers used to shoot just a few at a time and nobody paid much attention. The only difference now is they got a lot more ambitious." Many rural folks are well-aware that ranchers have always discreetly dispatched horses they think compete with their livestock. BLM itself reports recent cases of horses being intentionally tortured and maimed, as is the case with predators (USDI, BLM, USDA, FS 1980). And it is widely known that stockmen often shoot a horse or two to draw predators away from their livestock, or for carcasses to poison and leave for predators. For example, a northeast California rancher, Bobby Gene Bunyard, recently was charged by state and federal wildlife officials with gunning down a horse and then injecting its body with strychnine, which later killed a "protected" golden eagle. Again not surprisingly, the court system found the defendant not guilty by reason of insufficient evidence.

If all illegal horse killers were arrested and convicted, *hundreds* of Western ranchers would go to jail.

Even on northern Wyoming's Prior Mountain Wild Horse Range, free-roaming horses must compete with cattle. *(George Robbins Photo, Jackson, WY)*

Wild horses and burros which are protected by law are proliferating to such as extent that they are not only driving out all wildlife and livestock in many areas but also ruining range resources for generations to come.

--Ronald A. Michieli, as Executive Director of the Public Lands Council, which "represents the ranchers who graze livestock on Federal lands in Western states"

BLM estimates in 1989 show about 30,000 horses and 5000 feral burros roaming 47.5 million acres of its public land in 10 Western states, and that there are approximately 42,000 free-roaming horses and burros on all public land (understandably, very few survive on private rangeland). American Humane Association studies and other estimates place the figures at about 2/3 these numbers. Regardless, even BLM figures (which are for many reasons distorted to favor ranching) show that horses receive less than 5% as many AUMs in their range as do cattle and sheep.

Nonetheless, with great mock-concern, the agencies and ranchers claim that horses and burros are overgrazing the land and trampling water sources. Of horse grazing, public lands rancher Demar Dahl complains, "There was no vegetation left, and they ruined the springs -- did incredible damage!" (Satchell 1987). While it is true that in some areas horses have had an obvious impact, usually the main reason their influence seems significant is because they aggrevate an already severe livestock overgrazing situation. Head for head, cattle are more destructive to Western ecosystems than are horses. And while BLM estimates place the Nevada free-roaming horse population at about 20,000 (probably high; still Nevada has over half of the US BLM total), USDA figures place the number of cattle in the state at 620,000 -- 31 times the number of horses. In other horse areas, the disparity is even greater.

Regardless, some ex-public lands ranchers actually claim they were "driven out of business by wild horses." Their claims basically are cover-ups for poorly run operations, livestock overgrazing, and the fact that public land is simply an impractical place to raise commercial stock.

Wild horses trampling water holes? What do you think bovines do? Drink through a straw, maybe? Ranchers destroy more grazing land by overgrazing it, driving over it with their pickup trucks, and mismanaging it than any wild animals ever did.

--Reno Gazette-Journal letter to the editor

In conclusion, tens of millions of "wild" horses and tens of thousands of feral burros have been killed over the years by public lands ranchers and their government and private assistants. The 30,000 or so that remain represent probably less than 1% of their 19th century population. Compared to cattle and sheep, the damage they do is minuscule.

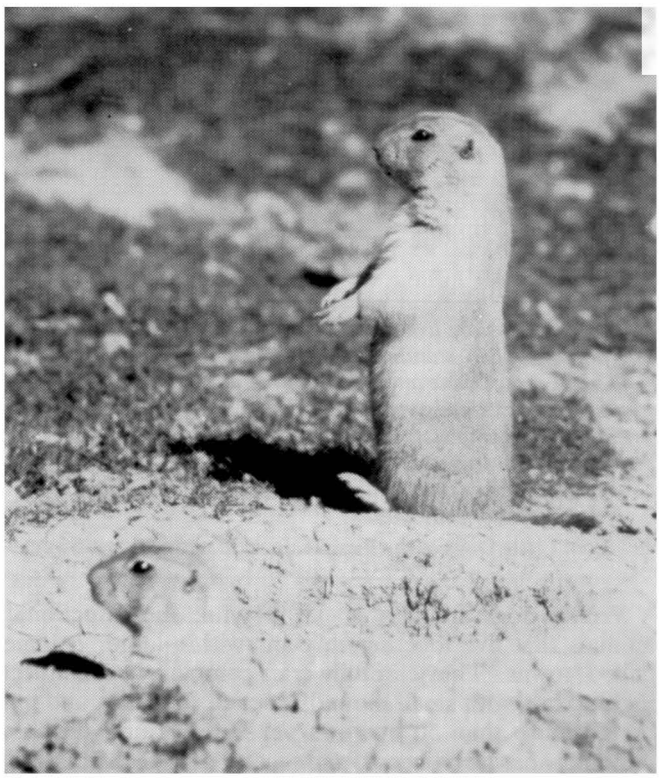
Yet, nearly all public lands ranchers want their numbers cut much further, and many want free-roaming horses and burros eliminated altogether. Conservationists contend that any AUMs gained by removal of horses and burros will just be used to further increase cattle and sheep numbers; this does indeed seem to be the trend.

At least a dozen organizations are dedicated to protecting free-roaming horses and burros. Some of them and some other groups and individuals think horses and burros should be given free reign throughout Western public land. Others think they should be restricted to certain areas. Some ecologists and others think that neither domestic stock nor "feral" equines belong in the ecosystems of public land. Whatever you believe, isn't it reasonable that as long as millions of domestic livestock are allowed on public land, so should a significant number of free-roaming horses and burros?

The free-roaming horses in Nevada are not true wild horses in the biological sense, for they all derive from fully domesticated ancestors and have not lost the genetic traits peculiar to domestic horses, but there are historically significant aspects of their origin which makes them a unique biological phenomenon.

--The Wild Horse in Nevada by Cheryl A. Young (Young 1985)

•Prairie dog



Prairie dogs are the worst thing to happen to rangeland.
--A rancher at the Nucla, Colorado, World Prairie Dog Shoot

Perhaps as important as any large herbivore to pre-livestock Western grassland and semi-grassland was the prairie dog. Belittled as a destructive "pest" by ranchmen, in reality it is (was) one of the industry's foremost competitors.

The prairie dog is a yellowish, plump rodent resembling a squirrel, about a foot long and weighing 1-3 pounds. It has short legs, small ears, and keen, high-set eyes. A uniquely North American mammal, its ancestors evolved on this continent about 35 million years ago, and the subsequent genus *Cynomys* has been found nowhere else on Earth. Five subspecies comprise 2 species: the blacktail, which lived throughout the Western plains from southern Canada to northern Mexico, and the whitetail of the inter-Rocky Mountain West. Combined, their ranges covered the entire eastern half of the 11 Western states. Both species live in open, relatively flat, treeless areas abundant in short to medium grass.

(Helen Wilson)

> *The clans mainly live in peace, with much sunbathing and grooming, often standing or sitting side by side with their forelegs around one another. Clan members are identified by touching noses and sometimes "kissing." Tribal in nature, the clan offers complete community cooperation. The members share burrows in time of danger, defend one another from strangers, share sentry duties, and generally live a tranquil life of respect for one another.*
>
> *--from* **Little Dogs of the Prairie**, Jack Scott and Ozzie Sweet

Prairie dogs are very social, playful, and affectionate animals that live together in clans within larger colonies called "towns." They carefully craft complex, interconnecting burrows with small mounds at each entrance, and may create more than 50 burrows per acre. Prairie dogs occasionally eat forbs, seeds, and insects (of which grasshoppers are a favorite), but by far their preferred food is grass. This works out well, for the overlapping, grazed, 100' or so diameter circles around burrows merge together so the entire colonies are free from tall plants that might conceal predators. (They also cut unpalatable plants from these circles.) Normally, regrowth of new vegetation within these circles remains in balance with the amount of food required. In these large, open towns, prairie dogs intermingle and, using their upright posture for better vantage, warn each other of impending danger with short, high-pitched, dog-like "barks."

Before the livestock invasion, some of these prairie dog towns were truly enormous, covering thousands of square miles and including millions of individuals. One was estimated to be 100 miles wide and 250 miles long (25,000 square miles) with *400 million* residents. In fact, prairie dogs were so incredibly numerous that the human mind can scarcely comprehend the numbers. More than 600,000 square miles (an area over 3 times the size of California) were occupied by an estimated *5-10 billion* prairie dogs! In other words, there were more prairie dogs in the West 150 years ago than there are now humans on Earth.

From these numbers alone, one can imagine the importance of prairie dogs to the Western environment. The rodents were a key food for countless millions of predators, including coyotes, wolves, foxes, eagles, hawks, owls, badgers, bobcats, and snakes. Their billions of old burrows gave shelter to burrowing owls, rabbits, spiders, crickets, ground squirrels, toads, box turtles, snakes, lizards, and numerous others. Their daily activities and burrowing action (along with that of gophers, squirrels, badgers, kit foxes, and others later killed off by ranching) aerated the soil; took organic matter and topsoil to lower levels; brought substratum to the surface and scattered it, subjecting it to weathering; and, by opening up deep holes, helped weather the substratum and turn it into soil. (Studies show that prairie dogs and some other burrowing rodents bring to the surface as much as 5 tons of subsoil per acre per year.) Their buried vegetation, runways, galleries, and holes helped counteract the packing effect of buffalo and other large-hooved animals. Burrows also helped water infiltrate to lower levels and conserve moisture, thus augmenting water tables. Indeed, some naturalists believe millennia of infiltration through billions of prairie dog holes was a major contributor to the huge Ogallala Aquifer of the southern plains, the largest store of underground water on the continent. (This aquifer has diminished rapidly, mostly due to pumping for livestock production, and may be depleted in 30 years.) Prairie dog mounds were vital components of the soil-air interface. Their foraging and surface activity helped prepare seedbeds, spread seeds, and create a diversity of conditions, thereby increasing fire, biotic, and zoologic diversity and, thus, ecosystem stability. The fresh soil they brought to the surface provided a medium for the germination of forbs, also augmenting diversity. At least 137 vertebrates, including pronghorn, buffalo, most birds, reptiles, amphibians, ground squirrels, mice, cottontails, jackrabbits, and predators, as well as arachnids, insects, and more were all more abundant around prairie dog towns than elsewhere on the open range. The towns were also important buffalo wallow and dust bath areas.

All this ended with the livestock invasion. Ranchers claim that cattle *increased* prairie dog numbers in the late 1800s by grazing off the grass and thereby "helping out" prairie dog towns. This is absolutely contradicted by research, common sense, and descriptions by Native Americans, early settlers, and explorers. The truth is, cattle depleted the prairie dogs' food source (causing it to range farther to keep fed, often into the mouths of predators) trampled their burrows, and ravaged their ecosystems. Prairie dogs are quite able to keep their towns free of tall vegetation without the assistance of cattle, sheep, or any other herbivore, as they had done for countless millennia. Actually, livestock helped greatly *reduce* the West's prairie dog population by 80%, to an estimated 1 billion by the early 1900s.

Western ranchers have always hated prairie dogs. The "damned varmints" ate "their" grass, and their cattle and horses sometimes broke legs in prairie dog holes. Later, the "unsightly" prairie dog mounds and holes made driving ranch vehicles over the open range difficult. As with so many other indigenous animals, the prairie dog became a scapegoat for destructive ranching, and prairie dog killing became a way for stockmen to release hostility and to imagine they were improving ranching conditions. In their profit-oriented way, contemporary range professionals found that 250 prairie dogs eat as much as a 1000-pound cow, so to them 1 cow = 250 prairie dogs, or 250 dead prairie dogs = the profit from 1 cow. A report by Daniel W. Ursesk disproves this greed-induced logic, and concludes that "Controlling black-tailed prairie dogs on rangelands in western South Dakota did not result in a positive increase in forage production after 4 years" (Ursesk 1985).

Defying reason, ranchers killed prairie dogs on principle. To people who had built their lives on unbridled exploitation of their surroundings, any animal that didn't have some obviously useful purpose deserved to die.

> *Ranchers actually transported sick* [plague-infested] *rodents in trucks, sometimes across hundreds of miles, with the intention of infecting local communities of prairie dogs and reducing their numbers, thus allowing cattle to find more grass.*
> --**Plagues and Peoples** by William McNeill

So early ranchers killed prairie dogs -- always -- with the weapons at hand: guns, poisons, traps, dogs, and, as above, disease. They shot as quickly as they could reload, put out as much poison as they could afford to buy, trapped as fast as they could reset, rewarded their dogs for dead prairie dogs, and released as many disease-infested rodents as they could import. But killing these seemingly numberless varmints was time-consuming and sometimes costly. Therefore, as usual, stockmen turned to the taxpayer.

Thus began in the late 1800s the official program to eliminate the prairie dog. By the early 1900s, the Biological Survey was dispensing strychnine-soaked grains. According to ranchers, however, this wasn't killing the animals fast enough. They demanded increased action. Soon federal, state, and local government agents assaulted prairie dog ranges with massive amounts of various poisons. The more they killed, the stronger grew the stockmen's desire for profits. By the 1920s, urged on by the government agents who also stood to gain, the ranching establishment was pushing for total extermination of the prairie dog.

After World War II, the prairie dog "control" program became a lustful, massive campaign of genocide against these peaceful creatures. Compound 1080 was added to the arsenal. Poison was used on all prairie dogs wherever livestock grazed -- in other words, nearly everywhere. Aircraft flew over their vast towns, broadcasting tons of poisoned bait. Soon, all the great colonies were destroyed. Billions of gophers, squirrels, rabbits, mice, seed-eating birds, insects, and microbes died along with the prairie dogs, as did the predators and scavengers that ate their toxic bodies. Some of the poison washed into waterways; some adhered to vegetation and was eaten by livestock. And, interestingly, the lack of rodents caused many larger predators to prey on livestock.

According to **The Wonders of Prairie Dogs** by G. Earl Price, altogether during the campaign *more than 800,000 square miles* of the West were poisoned. For a time it looked as though the industry would celebrate extermination or even extinction of the prairie dog.

This photo from the early 1900s reflects 1641 dead prairie dogs taken from 320 acres in Arizona. They were killed the previous day with 80 quarts of poisoned rolled oats. Only a fraction of the prairie dogs poisoned is shown because most of them die in their burrows. For decades, such mass annihilation by stockmen was commonplace throughout prairie dog habitat. *(Unknown)*

But the slaughter slowed in the 1950s, mainly because there were few prairie dogs left to kill. Also, the public was beginning to complain. People visiting National Parks and the few other areas where the rodents were protected enjoyed the "cute little animals." Others were concerned about the secondary effects of the massive poisonings. Under pressure and with little left to kill, the government discontinued most of its "control" program.

Prairie dogs reached a low in the early 1960s. They were extirpated from most areas, and healthy prairie dog towns were reduced to a few scattered locations. Today, despite ranching establishment misinformation, they have recovered only slightly. Towns of dozens or hundreds are found in some areas, but most colonies are too small even to maintain long-term genetic viability. Overall population is perhaps 0.25% of the pre-ranching number, and the Utah prairie dog is listed as Threatened.

It is unlikely that the prairie dog will ever significantly recover so long as the ranching establishment controls the rural West. Many stockmen still poison or shoot them whenever they can, as they have been conditioned to do from

childhood. Many of these people think it great sport to sit at the edge of a prairie dog town and pick them off one by one as they pop up from burrows -- like a shooting arcade. One rural community in southwest Colorado, Nucla/Naturita, has even begun a "World Prairie Dog Shoot" to eradicate the "pests." The Forest Service, ADC, state and county agencies still kill them. In 1987, for example, the Forest Service spread poison on nearly 6000 acres and in 3000 burrows to kill prairie dogs (USDA, FS 1988). ADC killed 124,000 in 1988, mostly with poison. Execution methods also include drowning, sterilization, and hole plugging.

The Simmons Allotment [Pawnee National Grasslands, CO] *Management Plan (1983) prescribed 80 acres as the maximum prairie dog town size. Each year we measure the size of our prairie dog towns. This year, we found that the town exceeded the 80 acre limit. The Forest Service is obligated to follow their agreement and discourage* [mostly kill] *prairie dogs when the town size has exceeded the maximum acre limit.*
--Grant Godbolt, District Ranger, Pawnee National Grasslands, Colorado

Of course, effects from the loss of this low-trophic-level mammal reverberated throughout Western grassland ecosystems. For example, the burrowing owl, which eats prairie dogs and nests in their burrows, plummeted to a small fraction of its original population and has not recovered. Other indirect repercussions have been enormous. As a random example, the disappearance of the prairie dog helped force coyotes and other predators into hills and mountains, where they then depleted wild turkey, quail, and grouse populations.

Burrowing owls, once very common residents throughout prairie dog range, have been reduced to only a tiny fraction of their aboriginal population largely by the annihilation of prairie dogs -- which were a major portion of their diet and provided burrows for nesting -- and by other effects of the eradication campaign, livestock grazing, and other harmful ranching influences. *(Bill Girden)*

Over the years control methods using toxic chemicals on Federal, State and private lands have not caused the decline of a single species of wildlife -- endangered or otherwise!
--Vern Vivion, past President, National Wool Growers Association

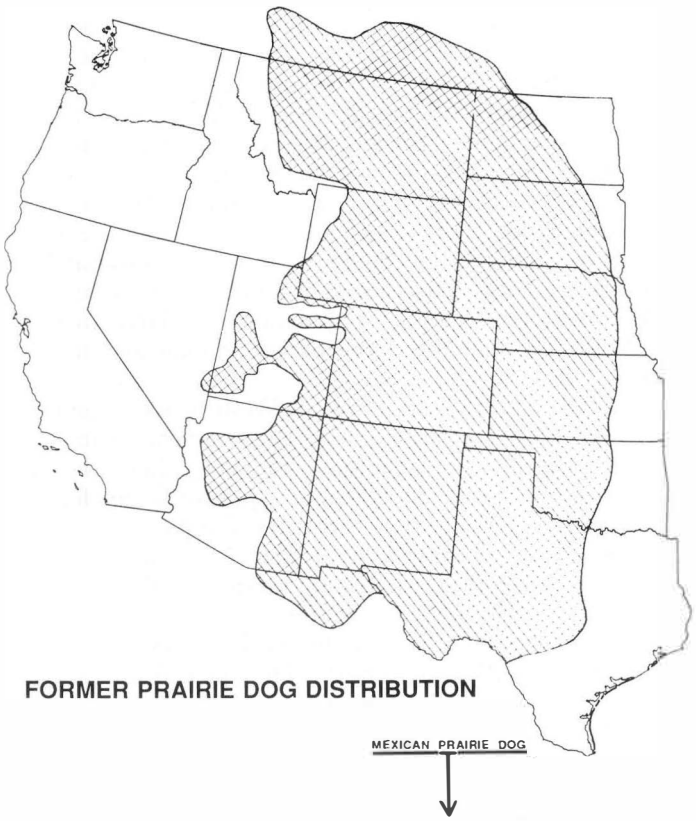
They lie.
--Mike Roselle

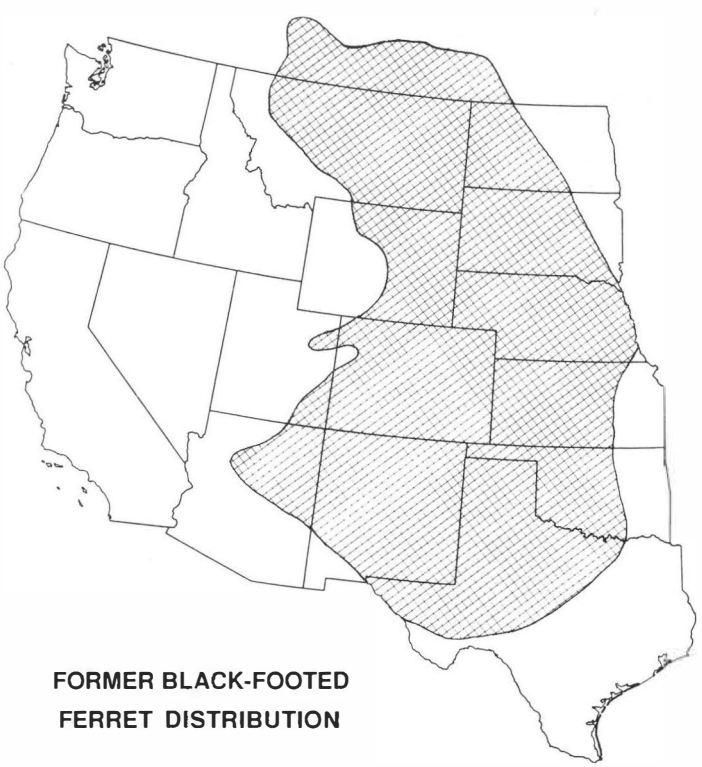
Another once-common grassland resident, the black-footed ferret, was so dependent upon prairie dogs that it is now among the most endangered mammal species on Earth. This mink-sized predator fed almost exclusively on blacktail prairie dogs, which also provided the ferrets with ready-made burrows for shelter and raising young. In turn, the ferrets imparted predator benefits to blacktail prairie dogs. With this strong, albeit seemingly lopsided, interdependency, the 2 species' ranges matched almost exactly.

(Robert Waldmire)

As with the prairie dog, the black-footed ferret was devastated by livestock grazing in the late 1800s. When the huge prairie dog poisoning campaign hit in the early 1900s, the ferret's fate was sealed. Not only was its food source nearly eliminated but, because it also eats carrion, it seems certain many were killed by eating poisoned prairie dogs. When the killing began to ease off in the 1960s, prairie dog numbers rose in some areas, but black-footed ferrets continued to decline. As scientists soon discovered, black-footed ferrets require *large* prairie dog towns in order to find both enough food and enough other ferrets to maintain genetically healthy populations.

From 1974 until 1981, no wild groups of black-footed ferrets were seen anywhere in North America, and many thought it time to declare the





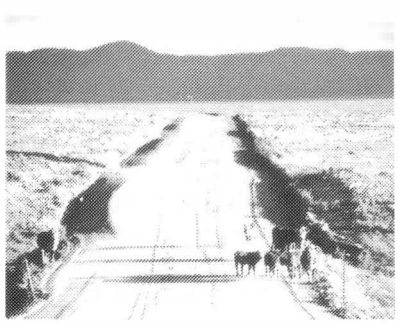
The black-footed ferret was so dependent upon the blacktail prairie dog for food and shelter that their ranges matched almost exactly (the discrepency seen here in the western part of their ranges refects whitetail prairie dog habitat). When the prairie dog was wiped out by the ranching establishment, so was the ferret -- nearly to extinction.

animal extinct. But in September of that year, near Meeteetse, Wyoming, a rancher's dog killed one that tried to eat from its food bowl. The rancher's wife took the lovely, furry, dead animal to a local taxidermist, who notified the government, who sent out scientists, who discovered a fair-sized colony of black-footed ferrets living among prairie dog towns nearby. Researchers studied and monitored the ferrets, but in 1985 the colony dwindled as plague decimated prairie dog towns and canine distemper -- possibly from ranchers' dogs -- killed some of the ferrets. By the end of 1985, an estimated 30 ferrets survived at Meeteetse. Following bitter fighting between government agencies, all remaining known wild ferrets were captured. They now await their fate in cages at the Sybille Canyon Wildlife Research Center in eastern Wyoming.

One has to wonder how many ferrets have been secretly dispatched by ranchers in recent years. A staunchly pro-ranching Wyoming state representative, Marlene Simons, in comparing the situation to wolf reintroduction, put it this way: "It's like black-footed ferrets. If you had a black-footed ferret in your back yard, you wouldn't want anyone to know about it, because then you couldn't get rid of it."

Tens of billions of prairie dogs have been killed in the ranching industry's massive secret war, but the massacre continues. Because the industry controls nearly all prairie dog habitat, prairie dog numbers remain minuscule, and the black-footed ferret faces extinction.

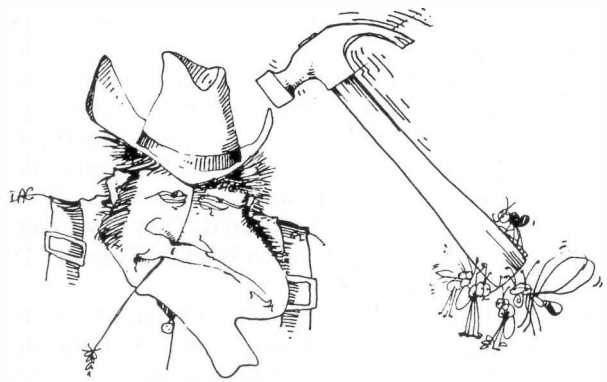
What might be missed are the endless miles of towns and the millions of wild dogs running, barking, wagging their tails, and stretching from horizon to horizon. That's what it was in the old days, but like those old days, the seemingly endless prairie dog towns are gone forever [are they?].
--Last paragraph of **Wonders of Prairie Dogs** by G. Earl Price



Ranching competitors are under triple attack: (1) livestock ruin their habitat; (2) the ranching establishment kills off the survivors; and (3) ranching advocates are the most vehement and powerful opponents of reintroductions and recovery efforts.

The industry fights other lesser competitors, including moose and even mountain goats. A great many of its smaller competitors are more commonly known as "pests."

Pests



An illustration from a government ranching publication.

Webster defines "pest" as "a plant or animal that is harmful or injurious to man." A stock-man may consider a pest to be any small animal interfering with his ranching operation. A scientist may have a different idea, a naturalist another. There is much disagreement over the lines separating pests from other categories of animals, but this is largely a matter of semantics and perspective.

In this section, we will discuss those animals that the ranching establishment generally considers pests -- mostly the small mammals and insects that compete with livestock for herbage. Many of these so-called pests are simply competitors ranchers want to give a bad name so they may gain government assistance, or at least meet less resistance in their attempt to eradicate the animals. For example, a county agricultural agent is more likely to support a poisoning project to eliminate "a destructive infestation of pocket gophers" than "pocket gophers."

Other supposed pests are simply species at high points of their natural population cycles. Livestock interests, using the upswing to justify eradication, warn of the dire consequences of not "controlling the invading hordes." For example, if an "infestation" of Mormon crickets on a certain allotment isn't exterminated, we are told, it will permanently damage the environment. Yet, Mormon cricket population fluctuations are normal occurrences to which Western ecosystems have been well-adapted for millennia.

Other "pests" are more properly *pests*, but ranching is primarily responsible for their existence in the first place. As we have seen, overgrazing and range developments simplify biosystems and sometimes set up conditions favorable for population explosions of opportunistic animal species. Ironically, the more a profit-hungry rancher overgrazes a range, the more pests he creates to minimize those profits.

These ranching-induced pest explosions are the most destructive type, for the overgrazing and range developments that caused them also impair the natural systems that would otherwise limit their destructive impacts. For example, a livestock-caused increase in jackrabbit numbers would otherwise result in a corresponding increase in predators which would reduce jackrabbits before they were able to seriously intensify the impacts of livestock grazing. Contrarily, an increase in jackrabbits under the full ranching scenario sets up a different set of circumstances. Because most predators have been eliminated, the jackrabbit population climbs far beyond normal limits. Jackrabbits eventually reach the point where they so overgraze the land that they and many other animals starve to death, soil erosion increases, etc. Or, population density may become so extreme that disease spreads and eventually reduces jackrabbit numbers far below their normal cyclical low point. Indeed, ranching-caused pest infestations have been linked to many of the plague epidemics over large areas of the West that annually claim myriad animals and several humans.

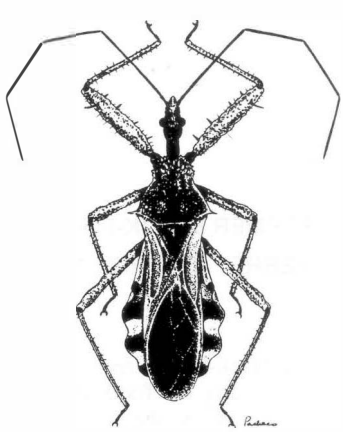
Though most pest infestations on Western public land are the *result* of overgrazing and range development (or acquisitive or delusional imaginations), ranchers blame the environment and make the taxpayer sponsor technological fixes, rather than reduce livestock numbers or range development. Thus have federal, state, and county governments become a pest eradication service for the ranching industry.

It wasn't always that way. In the late 1800s, ranchers themselves usually fought pests. They picked off rodents one by one with small caliber guns, poisoned and trapped as many as they could, taught their dogs to attack small animals on sight, and smashed with a shovel, rock, or bootheel those that weren't fast enough. These methods served ranchers for awhile, but the magnitude of the overgrazing and their voracity for profits eventually had them running to the government for large amounts of poison -- the most effective tool for killing pests.

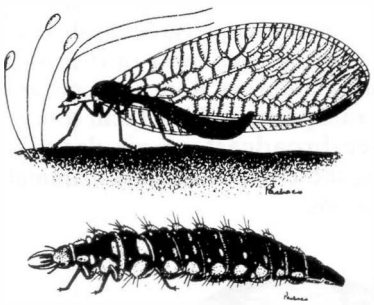
The government first used toxic bait in 1885 in a campaign to kill grasshoppers. The poisoning campaign against insects and rodents gradually gained momentum, and by the 1930s was in full swing. In subsequent decades, science and technology provided new and more powerful toxins and methods of dissemination, enabling the ranching establishment to "treat" thousands of acres at a time.

Compound 1080, banned from public land for more than a decade, was reintroduced as a rodenticide in 1985 by EPA. A similar poison, Compound 1081 (sodium monofluoroacetamide) also joined the industry's arsenal of chlorinated hydrocarbons, organophosphates, strychnine, arsenic, and other rodenticides and insecticides.

That these toxins are environmentally hazardous should be obvious. After all, *they kill animals*! In fact, generally they kill even more non-target animals than do predicides. Malathion and other insecticides kill **most** insects -- especially carnivorous insects -- on contact, and some may bioaccumulate as they proceed through the food chain. Insecticide sprayed on a valley to kill grasshoppers, for instance, also destroys many or most other insects in that valley --



The spined soldier bug – one of thousands of species of range insecticide victims.



Lacewing, eggs, and larvae.

bees, bumblebees, beetles, butterflies, and lacewings included -- some of the animals that eat the poisoned animals, and sometimes aquatic life.

This was well-demonstrated to my family and me a few years ago by a rural neighbor. That year, he sprayed malathion on his large garden to kill grasshoppers and aphids. Within a few weeks, we began finding dead bodies of songbirds in the area, and that year we had fewer songbirds. (Incidentally, within a few weeks our neighbor's garden was once again suffering more insect damage than was our organic garden!)

Rodenticides are similar. They are placed, in the form of tainted grain, in rodent burrows, spread around "problem" areas, or broadcast from aircraft. Poison grain left to kill, say, kangaroo rats may also be eaten by squirrels, voles, mice, rabbits, insects, songbirds, doves, quail, javelina, and any other animal that eats grain. And these poisoned animals may in turn be eaten by coyotes, foxes, skunks, weasels, badgers, ringtails, ground squirrels, hawks, eagles, owls, jays, crows, ravens, various insects, and any other animal that eats carrion.

The ringtail of the southern half of the US West -- another indirect ranching victim. *(Helen Wilson)*

Massive poisoning projects can lead to violent biologic fluctuations. For example, in many areas during much of the year coyotes subsist mainly on small rodents. The large-scale extermination of rodents may eventually lead an area's coyotes to move elsewhere or die. If other conditions are favorable, the lack of coyotes in the area may then result in an even larger infestation of rodents than was poisoned in the first place -- which, even more ironically, may further lead to a temporary sharp increase in the number of coyotes. These coyotes are then hunted as livestock predators.

The eradication of much of an area's insects or rodents often means loss of a vital food source for many animals. For instance, the poison deaths of most of an area's insects may also mean the deaths of some of the area's birds, small mammals, fish, lizards, toads, and so on. Non-target species may be devastated *even if only the target species is poisoned* because the target species is reduced far below normal limits. If ants are eliminated from an area, so are ant lions. If pocket gophers are killed off, gopher snake populations fall.

•Rodents

> *Vast amounts of time and money have been spent on their control, often under the theory that the rodents were the cause rather the an effect of range damage. However, numerous studies have shown that the most effective means of control is a three-stand barbed-wire fence, which keeps out livestock.*
>
> --Raymond F. Dasmann, **Environmental Conservation** (Dasmann 1972)

Rodents are shunned as filthy, dangerous, and worthless -- essentially the opposite of what they really are. The ranching industry also justifies slaughtering rodents as a way to reduce the spread of disease, especially rabies. But according to the Humane Society, "A rodent has never been reported to be responsible for a case of human rabies anywhere in the world." Mounting evidence shows that rodent slaughtering activities actually foster the spread of many diseases (Grandy 1989).

Perhaps half of the 100 or so rodent species on Western rangeland are pursued as vermin by the ranching establishment. When their numbers reach "unacceptable" levels, rodents are poisoned *en masse* with various baits, or killed with whatever implements of death are available. Much of this butchery is done quietly on a local scale by ranchers and county and state agents, but collectively their impact is considerable.

Perhaps the rodent stockmen most love to hate is the **jackrabbit**. As much as the coyote it is their mortal enemy, and more so than the elk a loathsome competitor. "Popping" at jackrabbits with rifles and pistols is traditional and habitual to stockmen.

Three species of hare, or jackrabbit, are native to the West. The *antelope jackrabbit*, identified by its pale whitish sides and hips, inhabits mid-elevations of southern Arizona. The *whitetail jackrabbit* is found in the open, grassy or sagebrush plains of the northern 2/3 of the West. And the *blacktail jackrabbit*, the familiar "range" jackrabbit most persecuted by ranchers, lives on the open plains and deserts in all but the northern portion of the West. Jackrabbits have keen senses, run 45 mph, and jump 20 feet in a single bound. They eat grasses, forbs, and other succulent vegetation; range professionals figure 150 of them eat as much as one cow.

On many ranges jackrabbits are the most numerous and sometimes the *only* large animal. It is unquestionably true that livestock grazing (and predator control or other range development) can sometimes increase jackrabbit numbers, sometimes explosively. But many perceived infestations are attributable to normal population cycles (averaging 5 to 10

years) and the fact that on a barren landscape jackrabbits simply *appear* much more numerous, and eat more herbage, than any other wild animal. Historical accounts tell us that jackrabbits were abundant in the aboriginal West.

Jackrabbits are poisoned with "treated" grain, hay, and salt; shot; run over with vehicles; and killed by ranchers' dogs. When their numbers reach epidemic proportions, they may even be killed by the thousands in huge, organized roundups. Large numbers of people surround an area known to have rabbits, "close the ring" to a small circle, and then club the trapped animals to death in an orgy of brutality. In **Sacred Cows**, Denzel and Nancy Ferguson report that, "As recently as 1982, about 100,000 jackrabbits were slaughtered in such drives in southeastern Oregon" (Ferguson 1983).

Because in some areas up to 75% of coyotes' diet is jackrabbits, their slaughter forces coyotes to prey more on livestock. So the ranchers kill more coyotes, which later in turn allows jackrabbit numbers to rise.

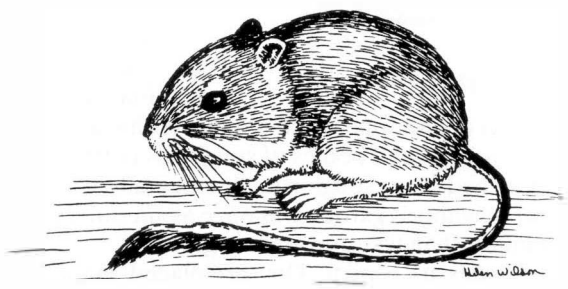
Five species of **rabbit** inhabit the West: the *desert*, *eastern*, and *mountain cottontails*, and the *brush* and *pygmy rabbits*. The 3 cottontails upset stockmen, especially the desert cottontail, which lives in a variety of habitats throughout the southern and eastern portions of the West and eats many forbs and grasses. Given its dietary preferences, it competes especially with domestic sheep.

Cottontails are not so persecuted by ranchers as jackrabbits, but are nonetheless widely killed. They are much less likely to proliferate on overgrazed ranges. In fact, because cottontails require abundant ground-level vegetation for food and cover, overgrazing and range "improvements" have led to their decline over vast areas.

A rich variety of **ground squirrels** inhabit the West. All but 1 of 14 species eat significant amounts of green vegetation. So ranchmen kill them. Even the closely related rock squirrel, which eats very little greenery, is widely killed -- "guilt" by association, one must conclude.

Many ranchers shoot ground squirrels with .22 rifles or shotguns whenever possible, often just for sport or target practice. They and their government agents also kill the rodents with traps, strychnine-treated grain and other rodenticides, and poison gas. Much of the 1080 used as a rodenticide is used to kill ground squirrels, especially the California ground squirrel. Reportedly, about half a million pounds of strychnine-laced bait is used annually in the US -- mainly in the West -- and is responsible for the documented deaths of 5 California condors, 6 peregrine falcons, 15 golden eagles, and 31 bald eagles. Undoubtedly these documented cases represent only a small fraction of the actual kill.

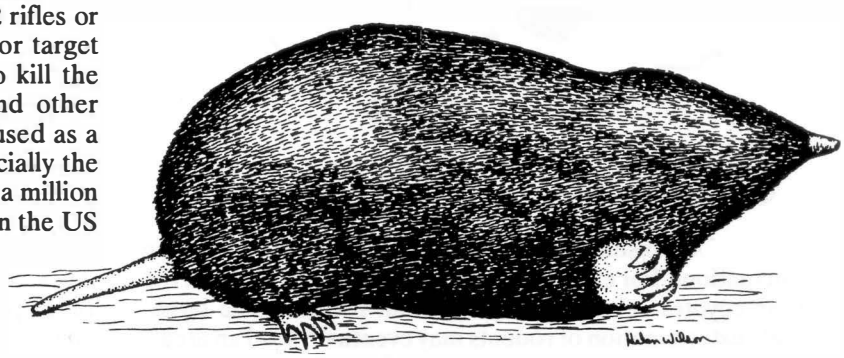
Thirteen species of *Dipodomys*, the **kangaroo rat**, live in the West. These are nocturnal, mouse-like creatures with fur-lined cheek pouches, white side strips, long, fluffy-tipped tails, and well-developed kangaroo-like rear legs that enable them to hop 5 feet or more. They manufacture all the water they need from starch in the seeds they eat (slightly augmented with the water from occasional greenery). Their arid to semi-arid habitat encompasses most of the West, especially the Southwest and California. Ranchers consider most species of kangaroo rats pests, and kill them or have them killed with surface-broadcast or air-dropped poisoned grain. Destroying these important tiny mammals has disrupted many ecosystems.



Kangaroo rat. *(Helen Wilson)*

Pocket mice are closely related to kangaroo rats, but are more mouse-like. Twenty species are known around the West, except in the Pacific Northwest. The species most common on ranched land, along with a number of other mice, are sometimes persecuted by the ranching establishment.

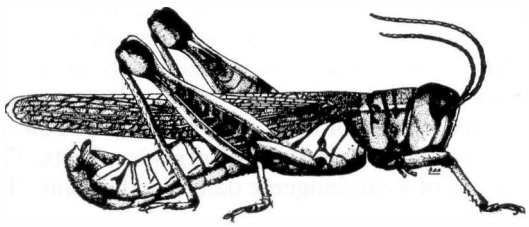
Pocket gophers, characterized by their fur-lined cheek pouches, tiny ears, digging claws, exposed double incisors, and short, hairless tails, live almost entirely underground. They are important as soil-forming agents, aid in water conservation and soil aeration, and provide prey to many predators. Because most species require ample, loose, cool, moist soil and succulent vegetation, overgrazing has had an adverse influence on pocket gophers in many areas. Pocket gophers dig burrows (that livestock could injure legs in) and eat roots, tubers, and some surface vegetation (that livestock could eat). Because of this, several of their 10 species are killed by ranchers and their government helpers with traps and poisons, often with strychnine-laced grain baits, and often on public land. The Forest Service alone reports "treating" 51,676 acres with pesticides in 1987 to kill pocket gophers (USDA, FS 1988).



Townsend mole. *(Helen Wilson)*

Voles, **moles**, **marmots**, and **woodrats** also are important components of Western ecosystems. Some species dig burrows, and many eat seeds or green vegetation. Therefore, many ranchers kill them.

•Grasshopper



Hundreds of species of grasshopper are native to the US, each uniquely adapted to certain plant species and habitat. Studies by M.I. Dyer and U.G. Bokhari in 1976 show that Western plants evolved to benefit from grasshoppers and actually produce more biomass under their various impacts (USDA, APHIS 1986). Throughout the West, grasshoppers also are an important food source for countless wild animals, with some species subsisting mainly on these nutritious insects during parts of the year.

Grasshoppers exhibit irregular yet cyclical population fluctuations in response to the amount of ground cover, soil temperature, soil moisture, abundance of predators, and so forth. These fluctuations usually are limited, but if many conditions happen to coincide, an explosive increase in grasshoppers may occur, commonly involving a mixture of several different species. Livestock grazing and range development have greatly increased the incidence and severity of grasshopper population explosions by: exposing bare soil in which grasshoppers lay their eggs; causing surface soil temperatures to rise, thereby promoting egg development; simplifying ecosystems, thereby hampering natural limiting factors; increasing preferred forbs in some areas; and eliminating grasshopper predators.

Generally, the intensity of explosions is in direct proportion to the intensity of livestock grazing and/or range development.

On the other hand, by severely reducing plant biomass, eliminating native plants and changing plant composition, and by drying out and damaging the soil, ranching has in many areas reduced grasshopper populations far below natural, healthy levels. In other words, in the rural West ranching is the major factor causing both unnaturally extreme grasshopper population reductions *and* explosions.

When plant food in an area is inadequate, grasshoppers may migrate to adjacent areas, or some species may physiologically transform themselves into what are termed "locusts." Basically, locusts are grasshoppers that have developed the ability to fly long distances. Thus, when ranching causes a population explosion of grasshoppers -- and when this growing horde finds that livestock have already consumed the vegetation in their area -- they may mutate into locusts and fly off *en masse* in search of food. The food they find may be in a riparian area, a corn field, or your garden. But most likely it will be on other rangeland.

Grasshopper infestations caused untold damage to range resources last year and we certainly hope that APHIS will take vigorous action this year to bring these pests under control.
--National Cattlemen's Association, in a 1986 letter to APHIS

As early settlers transformed the natural Western landscape into livestock ranges and farms, their problems with grasshoppers increased proportionately. For example, one of the greatest grasshopper plagues in US history occurred in 1874 -- just when Western ranching and farming were getting in full swing. Increasing complaints by agricultural interests led Congress to establish the Entomological Commission in 1877, which eventually evolved into the USDA's Animal and Plant Health Inspection Service (APHIS).

Grasshopper problems continued through the years. An especially destructive period of infestations was the 1930s -- a decade when livestock pressure was at a peak. In 1937 Congress ordered USDA into the grasshopper war. After 1945 several deadly insecticides -- chlorinated hydrocarbons -- were added to the arsenal. In the 1960s these were largely supplanted by malathion, carbaryl (Sevin), and other allegedly nonpersistent insecticides; in the 1970s the organophosphate acephate came into general use.

"Just go ahead and spray over the house," rancher W.D. Wear Jr. said to state officials after learning that malathion applications to kill grasshoppers would begin the next day on his [mostly public land] *ranch.*

"We can't spray it over your trucks," replied William Gorman, assistant director of the eastern region for the state Commission of Agriculture and Horticulture, pointing to his nearby vehicles. "It will wreck the paint."
--5-13-86 *Phoenix Gazette*

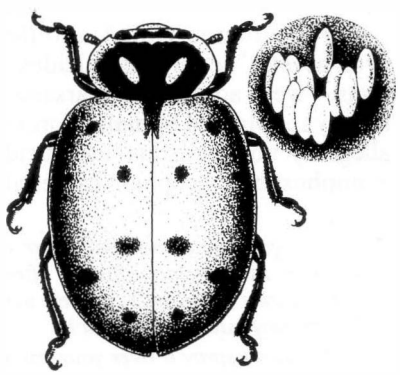
Under a co-operative management agreement, APHIS and other federal, state, and local agencies now spray insecticide, mostly malathion, on an average of **2.64 million acres (0.4%) of Western rangeland annually**, a large percentage of it public land. Poison baits, usually bran, are also employed, though in far lesser amounts. Chemical industry and government agents roam the rural West, "identifying" areas "needing" "treatment" and "enlisting" ranchers to participate in the poison programs.

APHIS *et al.* may spray blocks of land having 10,000 or more contiguous acres when all ranchmen within the block consent to participate, and when grasshoppers occur at the average rate of 8 or more per square yard, though most spraying begins when hopper numbers reach 15-30 per square yard. At high population points, eight (or even 20) per square yard is not naturally an excessive rate, but it is generally considered the point at which grasshoppers begin to significantly compete with livestock. Since "only" an average of 2.64 million acres are sprayed each year under these co-op agreements -- and, according to a Winrock International (a chemical company) spokesperson, an estimated average of *10 million acres* (1.5%) of Western rangeland are "infested" annually with grasshoppers above the 8-per-square-yard limit -- the grazing industry constantly pressures government for more insecticide. Not to be outdone, APHIS claims that the 2.64 million acres poisoned annually is only *11%* of the Western rangeland that needs it. In other words, if it could APHIS would poison *4.4%* of Western rangeland for grasshoppers annually! (USDA, APHIS 1986 and USDA, USDI 1979) Additionally, the Forest Service reported spraying 363,000 pounds of insecticide on 608,000 acres to kill grasshoppers in 1986, and

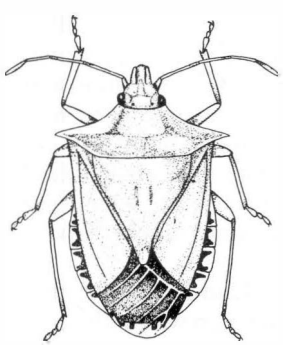
various other government agencies and ranchers add to the toxicant dissemination.

Acreage sprayed under the APHIS co-op program varies extremely from year to year, according to the intensity of infestations. In 1983, APHIS reported *no* spraying for grasshoppers. Only 2 years later, it dowsed *more than 13 million acres* with insecticide. In both 1986 and 1987, it sprayed millions of acres, largely in Idaho, Wyoming, and Montana, mostly public land; 1990 is expected to be another "bad" year in much of the West. Despite the spraying, there has been no overall downward trend in infestations.

All chemical insecticides are extremely non-specific, killing not only the intended insects but huge numbers of other insects, other invertebrates, and sometimes, depending on the circumstances, vertebrates. Even APHIS's ridiculously biased 1986 Environmental Impact Statement, *Rangeland Grasshopper Cooperative Management Program*, acknowledges that the agency's 3 favorite insecticides -- malathion, carbaryl, and acephate -- "adversely affect" (that is *kill*) substantial numbers of bees, a variety of beetles, leafhoppers, moths, wasps, moth and butterfly larvae, ants, flies, caddisflies, mayflies, stoneflies, mosquitos, midges, ladybugs, "certain beneficial insect parasites and predators," and arachnids (USDA, APHIS 1986). Poison deaths of birds, fish, and other vertebrates are documented.



A ladybird beetle (ladybug) and eggs.



A stinkbug.

Indirectly harmed or killed are animals dependent upon insects for food such as songbirds, fish, and coyotes, and plants such as those dependent upon insect pollinators for propagation. For example, a reduction in the bee population may mean a reduction in flowering plants dependent upon bees for pollination. Further, though hundreds of species of bees inhabit the West, many plant species can be pollinated only by 1 or a few species of bees; some Threatened or Endangered flowers may be pollinated by a species of bee almost as rare as the flower itself, and their range may be quite limited, especially after a century of ranching. A malathion spraying covering tens of thousands of acres may consequently kill off not only the rare bees but dependent rare flowering plants as well.

Adding futility to insult, much evidence indicates that spraying huge blocks of land with insecticides sometimes creates conditions that later cause extreme infestations of certain spider mites, caterpillars, aphids, and, again, grasshoppers! No wonder it's called an "insecticide treadmill."

The aforementioned 1986 EIS also states that acephate has a half-life of 5 to 10 days in soil and 50 days in water, that carbaryl continues to kill for weeks after application, and that malathion (the fastest-killing and widest-spectrum poison of the 3) takes an average of a few days or more to stop killing. Additionally, these chemicals may combine with other artificial or naturally occurring chemicals to produce compounds of even greater toxicity. Few studies have been conducted on such synergistic effects. There is also evidence of a carcinogenic danger to humans. (USDA, APHIS 1986)

Most studies of these poisons' effects on wildlife cited in APHIS's EIS exhibit an almost laughable pro-insecticide bias. Many species, including almost all plants and most reptiles and amphibians, aren't even studied. The Environmental Protection Agency and numerous concerned groups and individuals have repeatedly contested the government's grasshopper spraying program on many issues, including its blatant disregard for Endangered species.

Where ranching is concerned, however, environmental protection and common sense rarely prevail. APHIS and other bureaucracies involved spout impressive-sounding professional jargon, ignore everyone who doesn't agree, and arrogantly continue the massive poisoning.

> Nosema *is a commercially available protozoan pathogen that infects the fat tissues of grasshoppers. Infection spreads throughout the grasshopper, disrupting circulation, excretion, and reproduction, leading to disfigurement and/or death.*
> --*The IPM Practitioner* (Sept. 1985)

There are alternatives to chemical insecticides. The *Nosema locustae* microbe described above is being tested by USDA, BLM, and other government and private entities with generally fair, if erratic, results. But the ranching establishment prefers its poisons, especially malathion, and mostly gives *Nosema* lip service. And though touted by environmentalists as the "safe, organic" method of killing grasshoppers, *Nosema* is only so in comparison to insecticides. It entails expenditure of time, money, and materials and, if it works, it drastically and artificially reduces grasshopper numbers, perhaps negatively affecting an ecosystem in many ways like insecticides. And how would it feel to die over a period of days from a disrupted circulatory system, clogged intestines, and "disfigurement"? Does it make sense to pretend grasshoppers can't feel when we see them writhing in agony? A typical 10,000-acre grasshopper eradication with *Nosema* kills about **4 billion** grasshoppers in this painful manner -- so a couple of ranchers *might* be able to graze 10 extra cattle for a year or two (and keep the range degraded, thus promoting continued grasshopper infestations!).

USDA vilifies the grasshopper as livestock's most significant insect competitor, and APHIS implies that more than $80 million in herbage is "lost" to this winged demon yearly (USDA, APHIS 1986). Its profit-minded calculators figure that 301,395 grasshoppers eat as much herbage as a cow. Thus, by inference we are supposed to believe that killing 301,395 hoppers will make room for 1 more cow on the range. APHIS uses these figures and this mentality to justify its "control" program, but there is little evidence that the program is economically or environmentally warranted;

there is much evidence to the contrary. The solution to the grasshopper menace is to remove livestock from the public's land. There would then be little "need" for the destructive farce called grasshopper control.

> *Grasshoppers on the public's range should be viewed as a protein source* [as they are in parts of Africa] *rather than an expensive inconvenience to our exploitation of the range by exotic, inappropriate livestock. If we consider the grasshoppers as "winged bison" we will have a better perspective of the consequences of our extermination actions.*
>
> --Randy Morris, "Chicken of the Desert Enterprises," Mountain Home, Idaho, in a letter to APHIS (Morris 1986)

Mormon crickets, the famous insects that plagued early Mormon settlers beginning in 1848, are actually wingless, long-horned grasshoppers native to semi-arid intermountain rangelands and lowlands. They have natural population cycles similar to other hoppers. The small, leaf-eating creatures stand accused by the ranching establishment of causing "extensive damage" to the Western range, especially in Utah, Colorado, Nevada, Oregon, and Washington. APHIS even claims that "Mormon crickets have been estimated to remove 44% of the forage available to cattle and 48.6% of the forage available to sheep" (USDA, APHIS 1986). It's enough to make one wonder how the West got along so well without APHIS & Co. around to protect it from itself. To prevent Mormon crickets from eating range forage and irrigated alfalfa during the 1990 growing season the various agencies sprayed insecticide on more than 700,000 acres in northern Nevada alone.

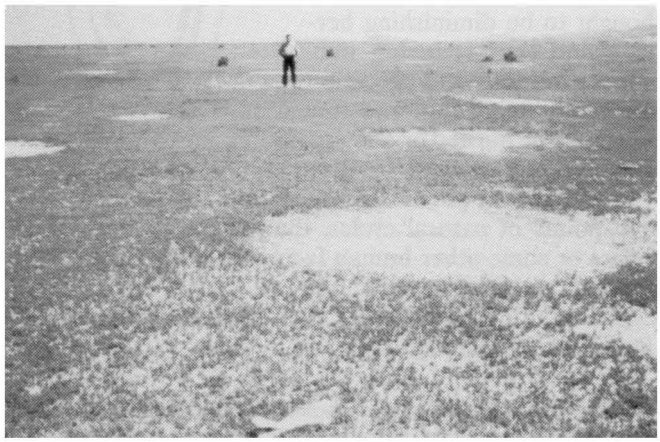
•Other insects

Even the tiny **ant** cannot escape the wrath of the ranching establishment. Ants are numerous and important participants in ecosystems on nearly all Western rangeland. Making contributions similar to those of rodents, they are a vital food source, soil- and mulch-forming agent, water infiltrator, diversity-enhancer and, of course, worthy in their own right.

Several species of *harvester ants* occur in the West, with the western harvester the most widespread. Something like prairie dogs, harvester ants build large mounds and clear the surrounding area of all vegetation for a radius of up to 10 feet. They forage on plants, especially seeds. Harvester nests can be 8 feet deep, with 60 chambers. An active nest may exist for 15 to 20 years and contain more than 10,000 worker ants.

Depending on environment, there may be from a few to 30 or more harvester mounds per acre. Also depending on circumstances, livestock grazing and range development may increase or decrease the number of mounds per acre. For example, a range seeding may drive away and kill ant predators and provide ants such an abundance of seeds and tender sprouts that they are able to thrive at rates of more than 40 mounds per acre. Overgrazing may favor large numbers of mounds in areas where dense vegetation has been thinned to the point that it no longer prohibits ants from establishing new colonies. In contrast, where ranching eliminates too much of their food source, it may reduce harvester ants (as it does most ant species).

With 25 mounds per acre, harvester ants may remove vegetation from 10% of the land. At this point (or before) ranchers and government agents may use chlordane or other poison against all harvester ants in an area; they attempt to kill the queen to kill the colony. However, some ranchers poison harvester (and other) ant mounds indiscriminately.

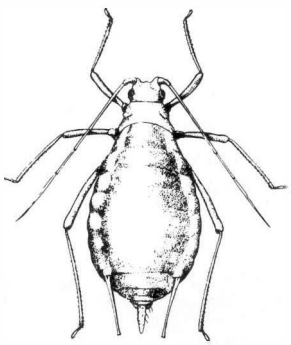


Harvester ant discs on severely degraded Idaho range. *(BLM)*

A harvester ant disc on remote, ungrazed range in northeast Utah. Note the lush vegetation.

Several small sucking insects are called **black grass bugs**. They thrive in and have infested millions of acres of crested wheatgrass and other exotic grass monocultures, though they are uncommon on healthy native vegetation. These insects are sometimes "controlled" with pesticides, by burning, or by intensive livestock grazing.

Many kinds of **grubs, moth and butterfly caterpillars, beetles, leafhoppers, stinkbugs, aphids, stem borers, thrips, mites,** and practically any **other small creatures** that eat or damage plants may be poisoned or burned when the animals are thought to be diminishing herbage and thus reducing livestock production. Vegetation harboring insect eggs and tiny pests may be burned or allowed to be grazed to nubs by livestock. Again, the perceived "infestations" may simply be the high points of natural cycles, the results of ranching activities or some other human factor, or coincidental alignments of natural circumstances.



An aphid.

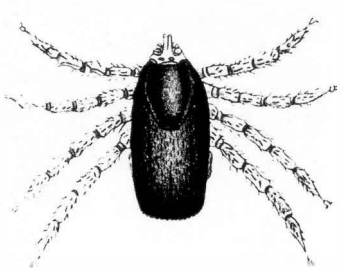
The solution to all these pest problems is incredibly simple: **stop ranching.**

As with small mammals, most problems from insects on rangeland have been caused by human activities such as overgrazing or extensive land clearing and revegetation with monocultures that reduce habitat diversity.

--from the ranching text, **Range Management**, by Jerry L. Holechek *et al.* (Holechek 1989)

•Parasites

The pest category may also include livestock parasites. These myriad host-dependent little animals include **mites, lice, ticks, blood-sucking gnats and flies,** and **various parasitic larvae and worms.** Under natural conditions, parasites don't often affect their host so seriously as to kill it; to do so would be suicide. Sedentary concentrations of livestock, however -- especially those under stress by overgrazing and other ranching practices -- often create unnatural situations in which parasites so lack limiting factors that without intensive veterinary intervention they may reach epidemic proportions.



A tick.

Perhaps the most celebrated campaign against a livestock parasite is APHIS's **Screwworm** Eradication Program. This exotic fly's larvae once killed thousands of cattle throughout the South and Southwest. Over decades, spending tens of millions of tax dollars, APHIS eventually eliminated the fly from the US by releasing tens of billions of sterile male flies in infested areas.

Farm [ranch] *property owners are exempt from registration and licensing requirements for pesticide application equipment, as is otherwise required under the Environmental Pesticide Control Act.*

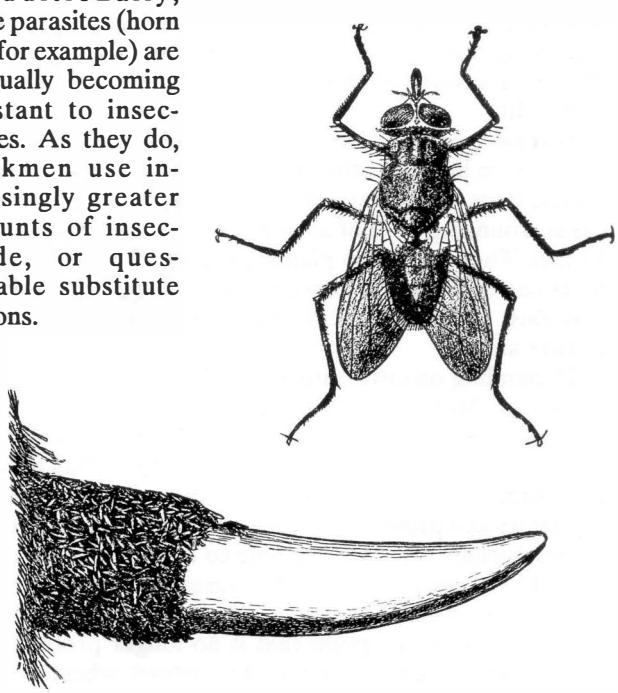
--Wyoming Statute 35-7-363(a)(i)

For most livestock parasites, pesticides are the killing agent. They are applied to cattle and sheep with liquid or powder sprays, dipping vats, portable spray-dip machines, pour-on and spot-on treatments, backrubbers, and dusts. The poisons usually are applied by ranchers, often in a careless manner (as stockmen generally have little knowledge of proper application), and ranchers often use too much of the toxin (to "make sure" all parasites are killed), or gamble with dangerous substitute pesticides. Thus, cases of environmental harm, livestock and human poisoning are not infrequent. Even if used properly, these are dangerous toxins.

One example is famphur, a compound commonly sold under the name Warbex and used to kill lice. Some bird species (e.g., cattle egret) peck parasites from the backs of cattle, ingesting the poison. They may die, or may be eaten by eagles and other raptors which may also then die. According to *High Country News*, 2 bald eagles in Lassen County, California, were found dead with signs of famphur poisoning. Even 4 months after application, the chemical can kill. One great horned owl died after eating a red-tailed hawk that had eaten a magpie contaminated with treated cattle hair. Evidence indicates that famphur has caused a decline of black-billed magpies throughout the West.

Studies have shown that other drugs used internally to kill parasites in cattle have killed earthworms, dung beetles, and other small creatures that come into contact with cattle feces. Without the aid of these animals, soil structure and fertility suffers and cowpies decompose much more slowly.

Additionally, some parasites (horn flies for example) are gradually becoming resistant to insecticides. As they do, stockmen use increasingly greater amounts of insecticide, or questionable substitute poisons.

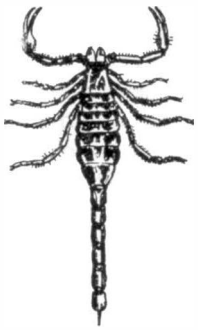


A horn fly (top), and horn flies on a cow horn.

USDA calls **mosquitos** a "scourge of livestock." The tiny winged Draculas may spread stock diseases or feast on livestock in such numbers that weight loss or even death occurs. Stock producers may seek "control" by spreading oil on larval waters or spraying toxins.

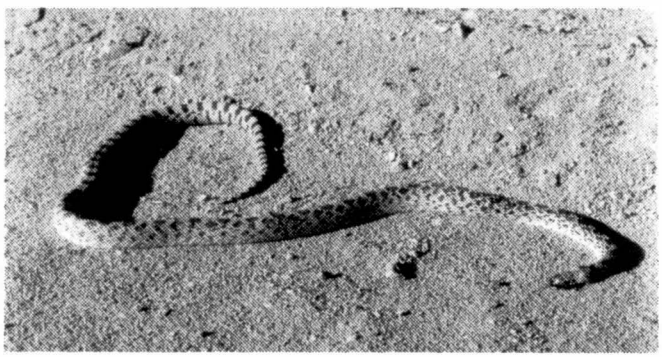
No-goods

The fourth category of ranching establishment animal enemy -- the one with the most members -- is the "no-good" group. Its basis stems directly from the Old West mentality that "The only good _____ is a dead _____!" This attitude remains prevalent among public lands ranchers.



So, **most rodent species** are shot, poisoned, trapped, run over, or killed by ranchers' dogs because "they're worthless varmints." **Scorpions, Gila monsters, centipedes, millipedes, black widows, tarantulas, ants, bees, bumblebees,** and **wasps** die because "they might hurt someone." **Bats, beaver, snakes, opossums, various rodents,** and **many others** die because "they carry disease." **Carp** and **suckers** are shot or caught, killed, and thrown away because "they're trash fish." **Worms, slugs, snails, spiders, beetles, crickets, cockroaches,** and **many other small creatures** are mindlessly squashed because "they're no good!"

Others are killed merely because they resemble offending animals. Thus, many ranchers kill not only livestock-predatory birds, but **all large predatory birds**. They kill not only plant and seed-eating squirrels, but **all squirrels**. They kill not only rattlesnakes and coral snakes, but **all kinds of snakes**.



A ranchman bashed in the head of this harmless gopher snake.

Birds are gluttonous and filthy.
--M.E. Ensminger, **The Stockman's Handbook** (Ensminger 1983)

Birds of many species are perceived as winged pests that spread disease and eat forage seeds. Stockmen shoot, poison, trap, or allow their cats to kill **magpies, crows, ravens, jays, mockingbirds, blackbirds, starlings, sparrows, swallows, pigeons, doves,** and **vultures** on both public and private land.

Skin of a porcupine killed by a local Forest Service permittee.

Wild animals (other than predators) that might physically harm livestock in some manner are another group of no-goods (or perhaps pests). For example, I know of a rancher who extirpated all **beaver** from a stream because one of his bulls got a leg stuck in a beaver dam and died. A professional range study even suggested eliminating beaver because they raise creek levels, thereby blocking the travel of ranchers and livestock!! Many ranchers shoot **porcupines**, ostensibly to reduce the chance of livestock being injured and infected by quills.

(Steve Johnson)

Rattlesnakes, feared as they are, are nonetheless beneficial to Western ecosystems. Millions of these fascinating reptiles of a dozen species inhabit the West. Yet only a few humans die from all snakebites (including bites from copperheads and cottonmouths) in the US annually, and most of these people have been harassing the snakes or are very young, sick, or old. Cattle and sheep -- omnipresent, clumsy, and liable to blunder almost anywhere -- are bitten comparatively often, occasionally dying from the poison or related complications. Stockmen also blame rattlesnakes for spooking their horses and for jeopardizing their own safety.

To eliminate rattlesnakes from the range, stockmen in the late 1800s began annual "rattlesnake roundups" in which local citizenry were enlisted in competitions to see who could bring in the most rattlers, dead or alive. In New Mexico, Texas, and Oklahoma today, ranchers still help organize rattlesnake roundups in which thousands of snakes are captured, mistreated, often tortured, and then killed. To

drive snakes from their shelters and capture them, participants spray gasoline into thousands of underground holes and crevices, in the process killing many other animals, contaminating the soil, precluding denning and hibernating use by other animals, and polluting groundwater.

From fear, superstition, and general hostility toward Nature, ranchers probably more than any other group kill rattlesnakes. Judging from personal experience, I have to conclude that most stockmen try to kill every rattlesnake they see (and any snake resembling a rattlesnake), with guns, vehicles, shovels, rocks, and whatever they can lay hands on. More than 100 years of persecution, in combination with overgrazing and other ranching impacts, has devastated some rattlesnake species, extirpating them from many areas.

The coatimundi of the US Southwest: persecuted by stockmen, harmed by livestock grazing.

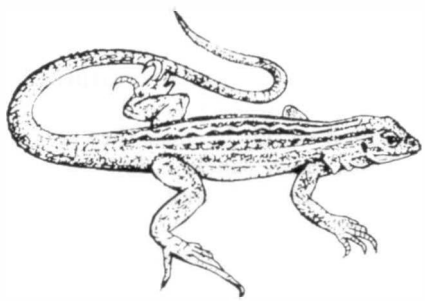
Other animal enemies are those that dig open burrows large enough for a cow, sheep, or horse to break a leg in. **Prairie dogs, ground squirrels, pocket gophers, and others** have already been mentioned. **Badgers** survive today at only small fractions of original numbers, yet they are still shot, poisoned, and trapped because they dig burrows. It is interesting that millions of buffalo shared the West with billions of prairie dogs, badgers, ground squirrels and other rodents, but ranchmen cannot tolerate even small numbers of these animals.

Wildlife that may prey on ranchers' poultry, rabbits, or other small domestic animals may likewise be considered no-goods. So, stockmen kill **raccoons, skunks, weasels, foxes,** and even **ringtails** and **coatimundis. Numerous other wild animals** are killed because they eat livestock feed stores or salt; some because they damage range "improvements."

Consider the impact simply from public lands ranchers' dogs and cats: Because these 30,000 stock raisers are allowed to graze livestock on public land throughout the West, their homes and businesses are -- far more than any other group -- located in close physical proximity to Western public land. Most of these ranchers own dogs and cats, often packs of dogs and many cats. Most of the dogs are trained to kill wild animals, and the cats are allowed to. These domestic predators (along with ranchers' abandoned dogs and cats) spend much time on public land, where they attack millions of wild animals annually, disturb wildlife, and spread disease.

Got a problem with squirrels? Poison the sons a bitches! Rattlesnakes in your area? Throw a stick of dynamite in their den! Bothered by magpies? Blast the fuckers with buckshot! Don't like lizards? Stomp 'em with a boot heel! More than literary dramatics, this is rangeland reality throughout the rural ranching West.

They're troublesome, dangerous, obnoxious, dirty, slimy, mean, stupid, ugly -- any conceivable reason will do. Each day for more than 100 years countless "no-goods" have been killed. Because these activities are remote and dispersed, their overall impact goes unrecognized. The ranching establishment would have us believe that this behavior is limited to a tiny minority of rancher "old timers," but it just ain't so.



In conclusion, 30,000 stockmen are spread evenly across Western public lands, and the vast majority of them kill predators, competitors, pests, and no-goods with guns, traps, poisons, dogs, trucks, boots, and whatever means available. By now, you may wonder if there are *any* wild animals that stockmen don't consider enemies, or treat like enemies. Reportedly there are: aardvarks and penguins.

Livestock Management

If a fragile and delicate environment will support cattle, or even looks like it will support cattle, custom dictates that it be promptly and fully stocked and not a blade of grass "wasted."
--Denzel and Nancy Ferguson, **Sacred Cows** (Ferguson 1983)

Another facet of range exploitation may be termed "livestock management." Basically, this refers to **(1) what kind, (2) how many, (3) where, (4) when**, and **(5) in what manner** livestock are grazed. Livestock management for each public lands ranching operation is based on diverse environmental, economic, social, and political variables. (For more detail on livestock management, consult Calef 1960, Ensminger 1968, Hickey 1977, or Holechek 1989)

● **(1) What kind** of livestock are grazed ostensibly is determined by the agencies, though the permittee usually has more decision-making power in this regard. The livestock breed is almost exclusively the rancher's choice. In practice, both the kind and breed are largely traditional.

Range characteristics such as vegetative cover, topography, water, poisonous plants, diseases, predators, insect pests, and wildlife competitors are strong influencing factors. Cattle prefer level to gently rolling ranges, whereas sheep and goats are better adapted to steeper topography. Sheep and goats can better exploit brushy and "weedy" vegetation, but are far more prone than cattle to predation, and to a larger variety of predators. Sheep also require less water than cows, and are better able to obtain water from the plants they eat; sheep can even get all the water they need from eating snow. Consequently, the woolly animals are grazed in large areas of the West that are impractical for cattle.

Breeds grazed are determined similarly. For example, Brahman cattle -- big, strong, and drought-resistant -- often are raised in hot, dry areas with numerous predators. Other popular range cattle breeds include the ubiquitous, white-faced, spotted hereford (Gary Larson, where are you?), black angus, charolais, shorthorn, and Texas longhorn. Popular range sheep breeds include Suffolks, Columbia, and Targee. And the overwhelming range goat favorite is the angora.

To maximize allotment productivity, some ranchers graze a combination of livestock types and/or breeds having differing dietary preferences and range characteristics. Correspondingly, this also tends to maximize biotic and general environmental degradation.

However, according to M.E. Ensminger in **The Stockman's Handbook**, "Actually, economic factors -- often unrelated to range characteristics -- probably have the greatest influence on the selection and popularity of kinds of livestock" (Ensminger 1983). The unwise choice of livestock has caused much unnecessary environmental damage; still, more importantly, **no** kind of domestic livestock is suited to the Western range.

● **(2) How many** livestock a rancher is allowed to graze on an allotment is called the "stocking rate" and ostensibly is based on the allotment's "carrying capacity," or maximum number of livestock the allotment can support on a long-term basis without causing significant environmental damage. Stocking rate likewise refers to the density of livestock on the range, which is a function of how many livestock are grazed, where they are grazed, and for how long. The Forest Service defines carrying capacity as "the maximum stocking rate possible without inflicting damage to the vegetation or related resources" (O'Toole 1988).

Officially, the stocking rate for each allotment is set by the land management agency based on the amount of available herbage, range condition and potential, allotment characteristics, conflict with other land uses, and other pertinent factors. In practice, stocking rates are set more by tradition, permittee influence, "grazing advisory boards" composed of local ranchers, and actual use (which often differs greatly from permitted use) than by the agencies. If carrying capacity is defined to mean the number of animals beyond which significant environmental damage occurs, nearly every allotment in the West is stocked far beyond its carrying capacity; the average allotment is probably stocked several times higher than its so-called "carrying capacity." But carrying capacity is an abstract, arbitrary, malleable term that on the Western range has nearly always been interpreted to benefit stockmen. For example, damage from livestock cannot be "significant" -- thus carrying capacity cannot be exceeded -- so long as ranching advocates dictate the meaning of the word "significant." ("Hell, it ain't hurtin' the land none," "Our assessment detected no potential significant environmental impact," etc.) Further, in setting carrying capacities most range personnel neglect that many ranchers habitually stock allotments with more animals than are allowed by permits.

Of course it is a foregone conclusion that every allotment must be stocked with *at least* as many livestock as it will "support." As Ensminger puts it, "Too light stocking wastes forage . . . ."

The *methods* of determining stocking rates are likewise faulty. For example, herbage estimates used to determine carrying capacity are based more on total allotment herbage than on how much of that herbage will actually be available to livestock. An allotment producing a total of 1500 herbage AUMs may be allotted 100 head of cattle -- the number of animals that would eat 1200 AUMs in a year -- even if 500 of the AUMs are in areas too steep, remote, or far from water for cattle to use. So, the 100 animals have only 1000 available AUMs and further overgraze their accessible range. On all allotments some parts will be more heavily used than others, but this isn't adequately compensated for by many range professionals in their determinations of carrying capacity.

Similarly, range managers often fail to consider that, rather than consumed, much of an allotment's available herbage will be trampled and otherwise destroyed by livestock; this places an even greater strain on the range.

Nor do they consider that a stocking rate based on observations at certain times may not apply throughout the grazing season or from one year to the next. For example, livestock allowed to forage an area's abundant spring grass

might cause minimal damage if withheld until mid-spring, but may thoroughly ravage the area in early spring when mucky soil is easily damaged by trampling and when young plants don't yet contain sufficient sugars and protein to rejuvenate leaves and stems lost to grazing. In another area, grass seeds may have already dropped when livestock graze in early September one year, but may still be developing -- and thus be destroyed -- when livestock graze in early September the next year. In yet another, high points in natural rodent population cycles may combine with the usual overstocking to devastate range vegetation at 10-12 year intervals, causing long-term decline.

Similarly, in setting stocking rates range professionals neglect the many extreme natural events that periodically and substantially reduce the carrying capacity of allotments. Studies at the Forest Service's Santa Rita Experimental Station in Arizona and elsewhere document that forage production sometimes fluctuates wildly from year to year in response to extremes of precipitation, temperature, storms, fire, and other influences. On much of the Western range, drought may reduce available forage to as little as 50% of the annual average. (Holechek 1989) Droughts there are so frequent and variable in their intensity that stocking the range on the basis of the average, industry-determined "carrying capacity" results in overstocking *almost half the time*, even by industry standards.

Stocking rates traditionally have been raised (legally or illegally) to take advantage of periods of high precipitation and increased herbage production, and then kept high as long as possible. Consequently, when drought or other "natural disaster" makes its periodic appearance, livestock numbers are even more out of proportion to what the ranges can support. The result is disastrous overgrazing, as occurred in Idaho in 1987 and throughout much of the West in 1990. For example, according to *High Country News* (1-21-90), in southeast Utah "cattle have eaten the dried annuals and are ripping perennial bushes out by the roots or chewing them down to stumps." Area resident Bill Hedden says the overgrazed range will "look like a parking lot or nuclear holocaust by the time they're done with it this winter," and there is nothing on the range now but "stumps of bushes, cow turds, and dirt."

Range professional Jared Smith wrote nearly a century ago:

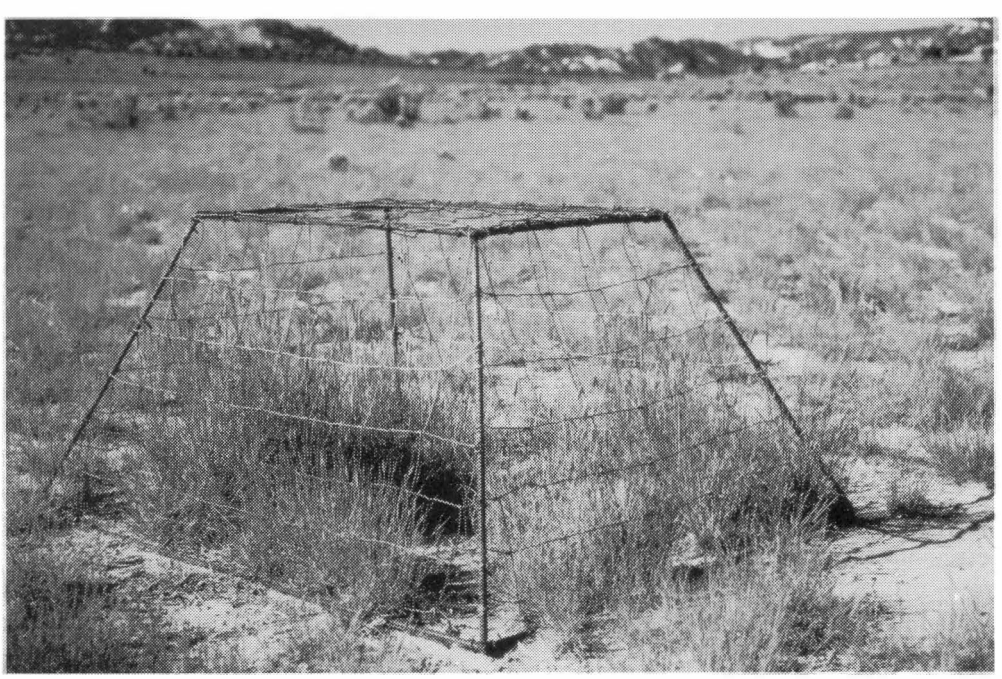
> *The maximum number of cattle that can safely be carried . . . is the number that the land will support during a poor season. Whenever this rule is ignored there is bound to be loss.*

To minimize harm to livestock, environmental damage, and taxpayer-sponsored "disaster" relief expenditures, prudent range managers should figure carrying capacities and set stocking rates for the *least* productive years, because by the time a drought or other periodic "natural disaster" occurs an ecosystem is likely already seriously overgrazed. Nature does not operate on fickle ranching schedules.

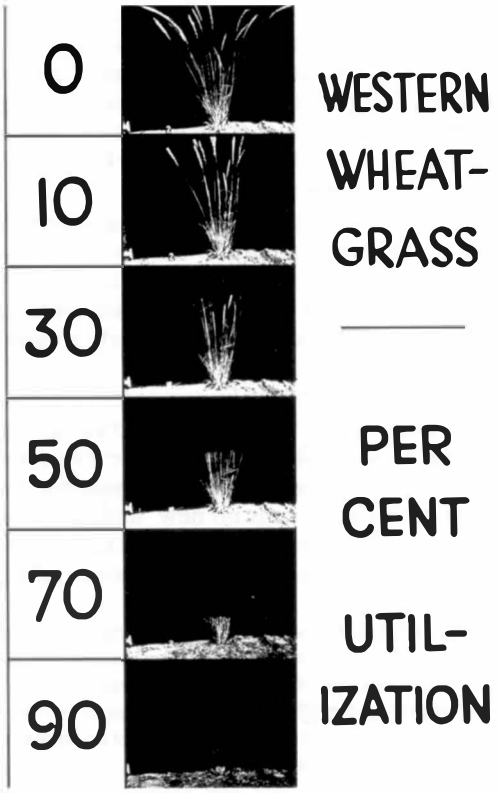
"Utilization" is the inverse of carrying capacity, being the percentage of herbage livestock remove from an allotment during a grazing period, whereas carrying capacity refers to the livestock that that food will support. The percent of utilization allowed ostensibly is determined by the land managing agencies based on most of the same factors used to determine stocking rate. Most public grazing permits allow livestock to consume 40%-70% of the above-ground biomass of forage plants. In fact, talk in professional range circles reveals that for most Western ranges 40%-70% depletion of herbage cover is widely perceived as "moderate" utilization.

Under natural conditions, wild ungulates generally did not remove nearly this percentage of vegetation. For example, on Africa's Serengeti Plain the world's greatest concentration of wild large herbivores consumes an average of only 20% of range herbage production annually (Ehrlich 1986). In other words, relatively speaking, our public land managers allow livestock to remove at least 2 to 3 times as much foliage from public rangeland as native herbivores do from Africa's Serengeti. (And, once again, large herds are not natural to most of the West.)

However, on-the-ground inspection of grazing allotments reveals that livestock typically consume an even greater percentage, often 80% or more of the herbage biomass. Agency personnel typically excuse this by saying that, though large areas may have 80% utilization, the allotment *as a whole* has lost "only" the permitted percentage. They explain that the allotment includes some areas inaccessible to or little used by livestock. Their explanation unfortunately does not lessen the damage to the heavily utilized bulk of the allotment.



BLM and some other land managing agencies use these tiny exclosures to help determine how much forage is taken by livestock. According to BLM range personnel with whom I spoke, this Utah cattle range has been "lightly grazed."



--from *Estimating Range Use with Grazed-Class Photo Studies,* The University of Arizona, Cooperative Extension Service, and Agricultural Experiment Station.

Utilization estimates are also faulty in that they are based overwhelmingly on preferred, common livestock forage species -- often exotics -- and not on *all* native species. Thus, an estimate of 50% utilization may mean that 50% of preferred grass, 95% of a rare, leafy herb, and 5% of a thistle's above-ground biomass have been removed from an area. As discussed, livestock, cattle especially, generally consume a greater variety of plant species than do wild herbivores.

Additionally, utilization is based on the *current* productivity of the range, not on what it would be if left ungrazed, or what it was 150 years ago. This is another way in which the industry keeps our public land in a *dynamic state of degradation*; by reducing overall environmental health in small increments, and by basing each current assessment on conditions a little more degraded than those preceding.

Finally, utilization estimates are strongly influenced by the same economic, social, and political forces that determine stocking rates. I have more than once been told by agency range personnel that obvious 50% + utilization was actually 30% or less.

- **(3) When** livestock are grazed, or the season of use, is chiefly a function of range characteristics during each time period as they relate to economic and political considerations. The wide diversity of climate, topography, vegetative types, and human factors in the West means that ranchers practice a great variety of seasonal use patterns. But most public lands grazing falls within 5 categories: (1) *summer*; (2) *winter*; (3) *spring-fall*; (4) *spring-fall-winter*; and (5) *all-year*. Most cattle are turned out onto the range at or near the beginning of the spring growing season and brought in in the fall or when herbage is exhausted.

To the casual observer, this fenceline contrast may seem insignificant. However, cattle have stripped off roughly 90% of the ground cover on the left side of the fence; the right side has been grazed only by deer, rabbits, mice, and other wildlife.

Most high mountain areas of the West are grazed only in *summer* because cold and snow make grazing otherwise impossible. Often livestock are moved to lower mountain elevations or high plains to spend *spring and fall*. Throughout much of the temperate West animals are moved in *winter* to the warmer lowlands, where they subsist on range forage, pasture, hay, and/or other feed. In much of the cooler West where mountain pasture is unavailable, livestock are left on public ranges through *spring-summer-fall* and brought onto private land for supplemental feeding during winter. Finally, livestock are allowed to graze *365 days a year* on much public land in warmer portions of the Southwest and California where, sparse as it may be, forage and browse are available year-long; this amounts to about 1/5 of BLM and FS rangeland.

As mentioned, the average duration of use on public land is about 4 months per year. This is chiefly because during the rest of the year public land is simply uninhabitable or deficient in livestock feed. Even so, considering the fragility of most public land, most grazing seasons are far too long. Further, many ranchers try to maximize their use of "cheap grazing" on public land by bringing livestock onto allotments before and leaving them after the use dates on their permits.

For those desert lands so denuded that year-round grazing is no longer feasible, the BLM has developed "ephemeral" regulations that allow cattle and/or sheep to be trucked into these areas when rare wet winters result in a brief "desert bloom." . . . Often cattle and sheep are released into areas where rain has not arrived, or before the plants have even had a chance to sprout. Even where grazing begins at the peak of the season, livestock are often kept there long after the plants have been consumed, forcing further damage to the perennial plant species that have managed to survive over a century of such grazing.

--Steve Johnson, "Grazing Impacts on Southwestern Desert Lands"

- **(4) Where** livestock graze, or their distribution on an allotment, is determined by the kind and type of livestock grazed and the allotment's unique characteristics and environmental conditions in relation to range management and developments. Livestock, cattle especially, have a strong tendency to utilize the more level, grassy bottoms and ridgetops and concentrate around water and shade. To distribute them more evenly over allotments, ranchers build fences and water developments, salt strategically, ride the range, kill off livestock predators and pests that cause animals to congregate and seek protection, and employ a wide variety of grazing systems. Unfortunately, they distribute ranching degradations along with their livestock.

  Worldwide, *herding* is the traditional means of forcing livestock to evenly utilize and maximize use of forage and browse. On the Western range sheep often are herded, or at least closely watched, rather than left completely untended for long periods, as is the case with the vast majority of cattle. Some sheep are herded with dogs. Some are now fitted with electric devices that automatically emit shocks to animals that stray too close to a sensing wire surrounding the herd; they eventually learn to stay away from the wire.

  In general, however, herding has become rare in the US West, due mostly to high labor costs and the fact that so few modern Americans are willing to sleep on the ground (unfortunately), eat canned beans, and follow/drive a bunch of hoofed dullards around for months at a time.

- **(5) In what manner** livestock are grazed depends chiefly on the grazing system used. A "grazing system" is a particular scheme used for grazing livestock on the range. The type of grazing system used determines herbage intake and production; livestock distribution over the range; susceptibility to predators, disease, and parasites; and so forth. Generally, it depends on economic considerations particular to each ranch.

  Each allotment management plan contains details of a grazing system supposedly designed for that individual allotment. In practice, the permitted system often is modified by the permittee as he sees fit, or through forces beyond his control. For example, a flood may destroy a fence and allow cattle to graze a portion of an allotment not scheduled to be grazed until the next growing season. Ranchers may be officially permitted to alter planned grazing strategies in response to declared emergencies. For example, during the 1990 "drought disaster" declared in Arizona, ranchers were allowed to abandon management plans and drive cattle into areas with more herbage and water.

There is no best grazing system. Certain kinds of grazing are generally preferable under certain circumstances. But countless studies demonstrate that for best results a grazing system must be designed to suit each particular range situation. This involves additional government and private time, work, and money -- additional time, work, and money the rancher often does not want to provide.

The environmental impact from grazing systems likewise varies with each range situation. Still, in most cases the differences in overall environmental impact from the various grazing systems are relatively insignificant. The stocking rate per total area grazed is nearly always a vastly more important factor.

Moreover, livestock grazing by any system is almost never more environmentally benign than non-grazing, regardless of circumstances. Over the years, nearly every conceivable grazing system, and combination of systems, has been tested. Consequently, there is no new "undiscovered" grazing system that will revolutionize public land ranching and make it economically practical or environmentally benign.

The basic [ranching] *strategy, regardless of grazing system, has been and seemingly continues to be to maintain the maximum number of livestock possible . . . . Stocking rate is and always will be the major factor affecting the degradation of rangeland resources. No grazing system can counteract the negative impacts of overstocking on a long range basis . . . .*

--Range professionals Pieper and Heitschmidt, in a 1988 paper

Though no 2 grazing systems are exactly alike, nearly every public lands rancher in the West uses (consciously or not) 1 or some combination of the following 4 basic grazing systems:

(a) *Continuous grazing.* Much of public land is grazed more or less continuously. This does not mean animals are necessarily grazed all year but throughout the period or periods when grazing is possible -- when adequate herbage is available and other conditions are conducive. On Forest Service and some other federal and state lands, supplemental feed occasionally is given to stretch animals' time on public range. (BLM officially allows only concentrated protein/mineral supplements, but much unauthorized feeding of other supplements does occur.) For the balance of the year, livestock usually are moved to private land to eat forage, pasturage, or stored feed. Or they are moved directly from public land to feedlots or slaughterhouses.

Most ranchers prefer continuous grazing to other systems because it generally entails less expense for fences, livestock handling, and planning and monitoring, and it maximizes herbage utilization in grazed areas. There is a persistent myth, spread mostly by proponents of rotation grazing, that continuous grazing necessarily begets worse overgrazing than other livestock grazing systems. Studies show that generally this is not true except in localized areas, such as riparian areas, where livestock are allowed to concentrate for long periods.

(b) *Rotation grazing.* In this system, an allotment is divided into several or many different pastures. A heavy concentration of livestock is placed on one pasture for a short period (usually a few days to a few weeks), while the others remain ungrazed. When the herbage in the first pasture is depleted,

the animals are moved on to the next, and then to the next, until eventually returned to the first pasture when it has (ostensibly) once again regrown enough herbage to withstand another period of grazing. Thus, the mass of livestock is alternately moved at intervals from one pasture to another throughout a growing season. Depending on a host of variables, each pasture may be grazed 1 or more times per year.

Rotation grazing, largely in the form of range consultant Allan Savory's so-called "Holistic Resource Management," has experienced a surge of popularity in recent years, for political as well as economic reasons (see Chapter XII).

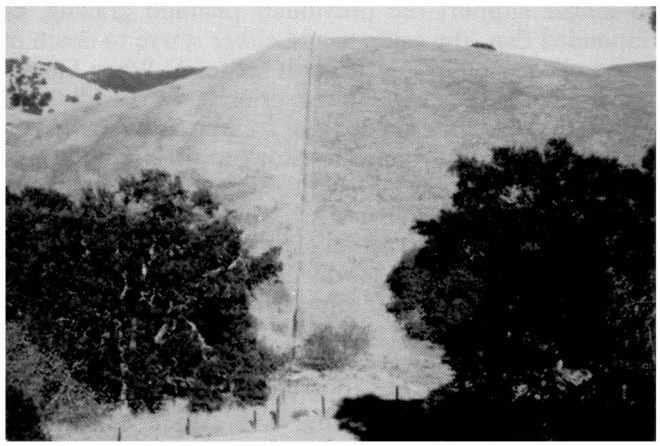
(c) *Rotation-deferred grazing*. This method divides an allotment into several grazing units. At least 1 unit remains ungrazed each year until after the seed crop has matured. The next year a second pasture is deferred while grazing on the first is delayed as long as possible to allow seedlings to become established. And so on. In this way, eventually each of the units is in theory rested and allowed to reseed.

(d) *Rest-rotation grazing*. Similar to rotation-deferred, rest-rotation grazing is a system in which one area of an allotment goes ungrazed for 2 or more growing seasons while all livestock are crammed onto the remainder of the allotment. Another area is then rested in the same manner while the herd is crowded onto the remainder of the allotment. And so on, rotating rest periods between areas. Supposedly, each area is rested long enough that livestock-palatable plants have a chance to recover. Concurrently, each area is grazed heavily enough that animals are forced to eat "undesirable" plants and "utilize" unpopular sites.

Maybe, when all else fails, the BLM will play a shell game, shuttling cattle from one pasture to another to create the illusion of better management while failing to face up to the fact that there are simply too many cattle on the allotment.

--Joseph M. Feller, "The Western Wing of Kafka's Castle" (Feller 1990)

Having clearcut the right pasture to bare dirt, sheep are driven to the pasture on the left to repeat the process. Central California BLM.



Though perhaps not evident in this photo, rotation grazing has stripped off more than 80% of the right pasture's above-ground biomass.

Various rotation grazing systems (and combinations thereof) presently are in vogue with the government and many ranchers. They shuffle livestock back and forth between pastures in an attempt to take advantage of vegetation at different stages of growth. While touted as simulations of natural grazing, none of these systems reflects the behaviors of native herbivores. And, regardless of how they are shuffled about, livestock remain imported, inbred, hybrid, domesticated animals, under human control and living grossly artificial lives. While advertised as "progressive, scientific" range management, livestock kept on the move have not been shown to be significantly less destructive than those kept more sedentary (Holechek 1989). Also, many stockmen shun rotation grazing, complaining that the constantly moving stock burn up too many calories.

Use of rotation grazing systems is intended to not only placate those concerned about continued overgrazing, but to *increase* the number of livestock on public land. Critics call it "systematic overgrazing."

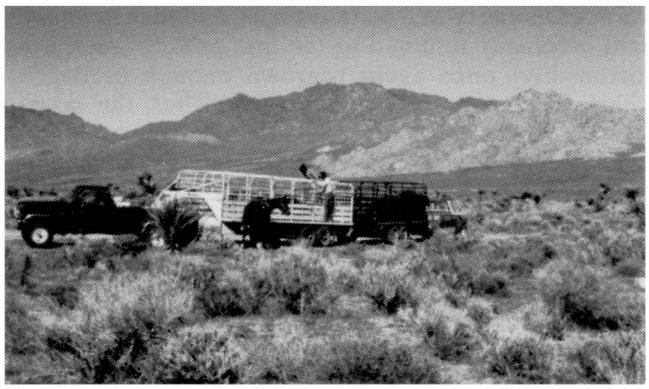
Another reason for the popularity of rotation systems is that during declared emergencies -- which are surprisingly frequent -- ranchers may graze their livestock on the normally ungrazed portions of allotments. For example, in 1990 Cochise County in southeast Arizona was declared a drought disaster area by the Governor. Permittees using rotation systems were allowed to move their cattle onto portions of allotments that otherwise were not scheduled to be grazed until some future date. Simply put, future overgrazing was almost guaranteed in order to provide livestock emergency herbage. When I asked the area BLM range specialist what would happen when the already-grazed portions could

no longer support the previously planned grazing, he responded that "the cattle would either starve to death or have to be moved to private lands for feed." When I asked why livestock were being given priority over wildlife, he replied that livestock needed that forage. And why weren't ranchers required to move livestock to their private land during drought disasters? Same answer.

To implement rotation grazing, governments' long-range plans call for the construction of tens of thousands of miles of new barbed wire fences to divide our public land into ever smaller "pastures" for ever more intensive grazing management. Likewise planned are thousands of new stock watering tanks, roads, cattle guards . . . .

Agency people like all this because it increases their bureaucratic power and justifies their existence. Ranchers like it because they may be able to squeeze more cattle onto the same number of acres and have government pay most of the extra cost. And it looks good to the public because parts of the range are given "rests" from grazing and it seems as if something is being done about overgrazing.

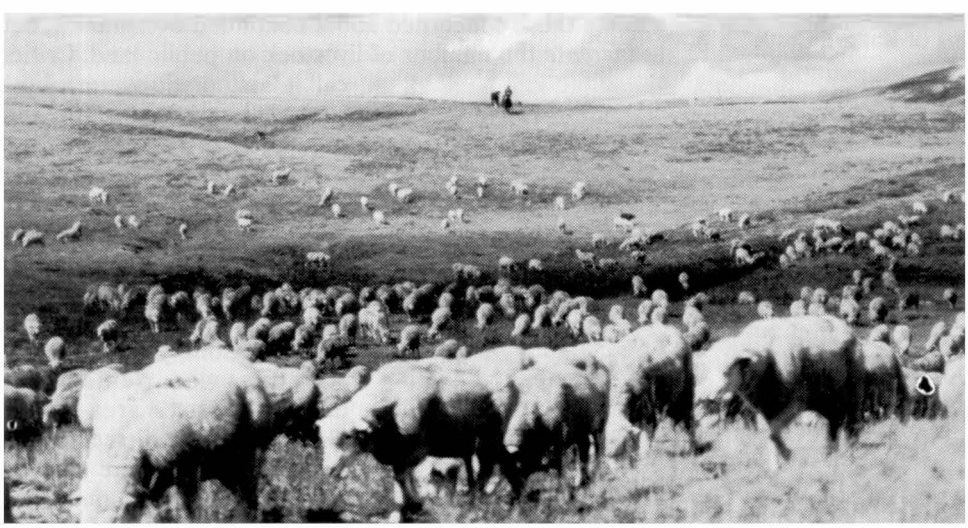
Unfortunately, once again, the public and the land lose and ranching wins. Administration becomes more complex, difficult, and expensive, while the probability of permit violations and range abuse increases. Rancher and bureaucratic power spreads, while other public lands uses are limited and degraded. We the public pay for most of these extra so-called "improvements," while our land is grazed that much more heavily when it is grazed. Wildlife must somehow adapt its needs to the intensive on-off grazing cycles. Large animals increasingly are killed and restricted in movement by more and more fences. Livestock and their attendant problems are spread to areas previously grazed lightly, if at all. Ranching development is spreading like a cancer over our public land.



Routine ranching activities -- done tens of thousands of times each day -- disturb Western ecosystems.

Livestock management activities also include: rounding up and dispersing; collecting strays; separating sexes, age groups, and breeding stock; culling the old, sick, and infirm; branding, dehorning, castrating, and treating stock for disease and parasites; shearing sheep; and simply monitoring livestock. Disturbances from ranchers in vehicles, on horseback, on foot, or even in ultra-lights, airplanes, or helicopters during these and other management activities cause environmental damage and help fragment habitat. For example, the Forest Service notes in *Run Wild -- Wildlife/Habitat Relationships*, "Disturbances caused by cattle round-ups cause bucks to flee their home range to adjacent pastures."

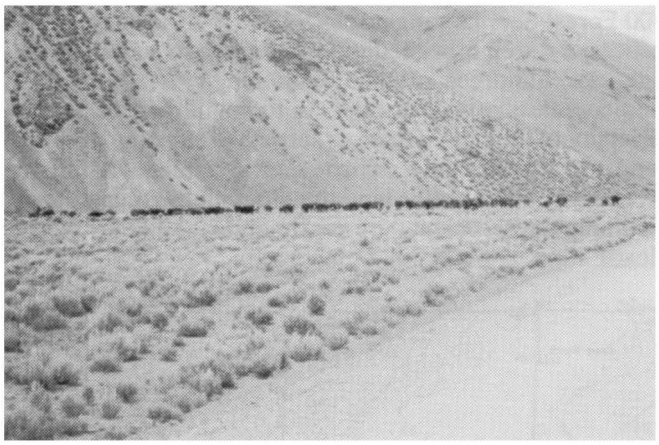
A rancher in a noisy pickup truck upsets the wild animals in a remote canyon. An afternoon of branding calves leaves a small grassy flat in poor condition. A mounted cowboy, in scrambling to collect a stray calf, tramples a steep hillslope, killing vegetation and displacing soil. A herd of cattle driven across a valley during a roundup leaves a wide trail of trampled vegetation, terrified wildlife, and pulverized, exposed soil. (For example, the main detriment to the small Utah cactus, *Pediocactus winkerli*, when it was first listed as federally Endangered, was trampling from cattle being driven through its habitat from one grazing area to another.) Livestock loading, unloading, and servicing create especially degraded conditions, if not sacrifice areas.

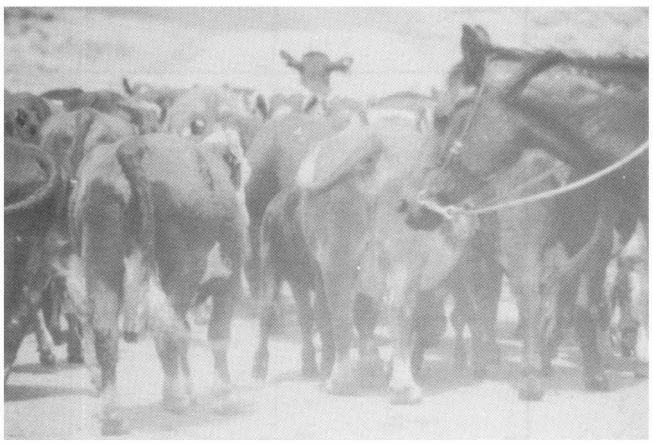


Sheep in Bighorn National Forest, Wyoming, being driven to lower elevation pasture. *(George Robbins Photo, Jackson, WY.)*

I know of areas here where I live that abound with wild animals, large and small, until the sheep arrive. After a thousand sheep and the men and dogs move into an area . . . many wild animals, and most all of the larger ones, must go elsewhere, out of fear or lack of food . . . .
--Lynn Donnelly, Marble, Colorado, letter to the editor of *Colorado Outdoors*

All these activities harm the environment in many of the ways discussed in this book. Wild animals are forced from their nests and driven from their home ranges; separated from their young, group, or herd; hindered in mating; interrupted in feeding and watering; forced into the open where they are more vulnerable to predators; driven from shelter into harsh weather or hot sun; made to run away and expend valuable energy; robbed of sleep or rest; psychologically disturbed; and so on. The cumulative impact of 30,000 ranchers performing routine livestock management activities on public land is considerable.





Herding cattle across an Idaho BLM range: In some people, such scenes evoke a rustic nostalgia, but the environmental damage is very real.

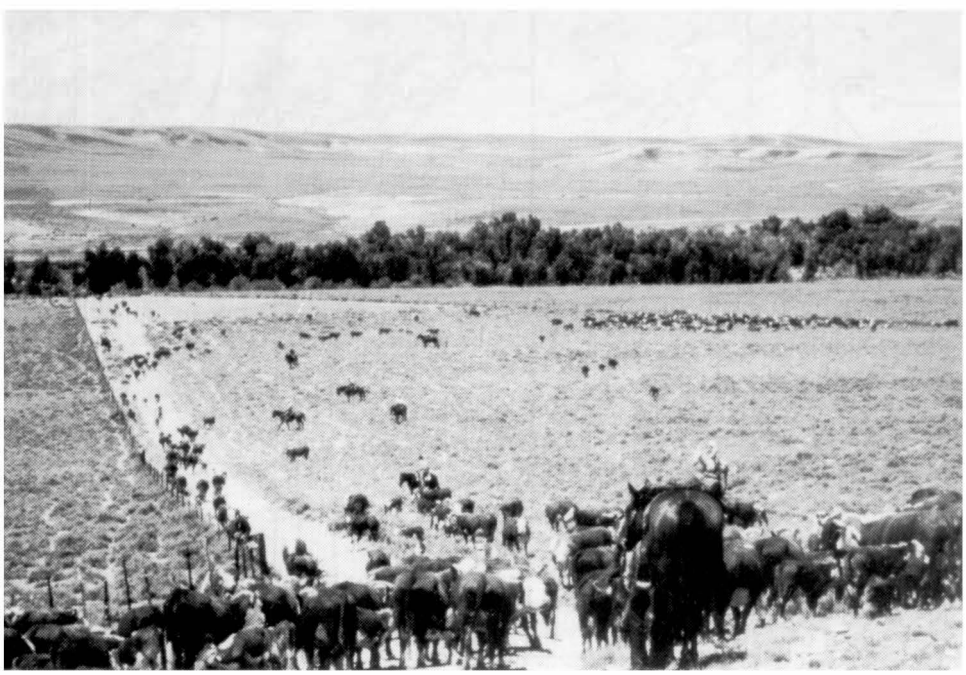
Thou shalt inherit the Holy Earth as a faithful steward, conserving its resources and productivity from generation to generation. Thou shalt safeguard thy fields from erosion, thy living waters from drying up, thy forests from desolation, and protect thy hills from overgrazing by thy herds, that thy descendents may have abundance forever. If any shall fail in this stewardship of the land thy fruitful fields shall become stony ground and wasting gullies, and thy descendants shall decrease and live in poverty and perish off the face of the earth.
--W.C. Lowdermilk, **Conquest of the Land Through 7,000 Years** (Lowdermilk 1975)

Understanding Range Development

This lengthy chapter has detailed the numerous ways the ranching establishment manipulates public land for its purposes and how this in turn affects the natural environment. Indeed, range development probably causes as much overall environmental damage as livestock grazing itself. So, why don't we recognize its impact on the Western landscape?

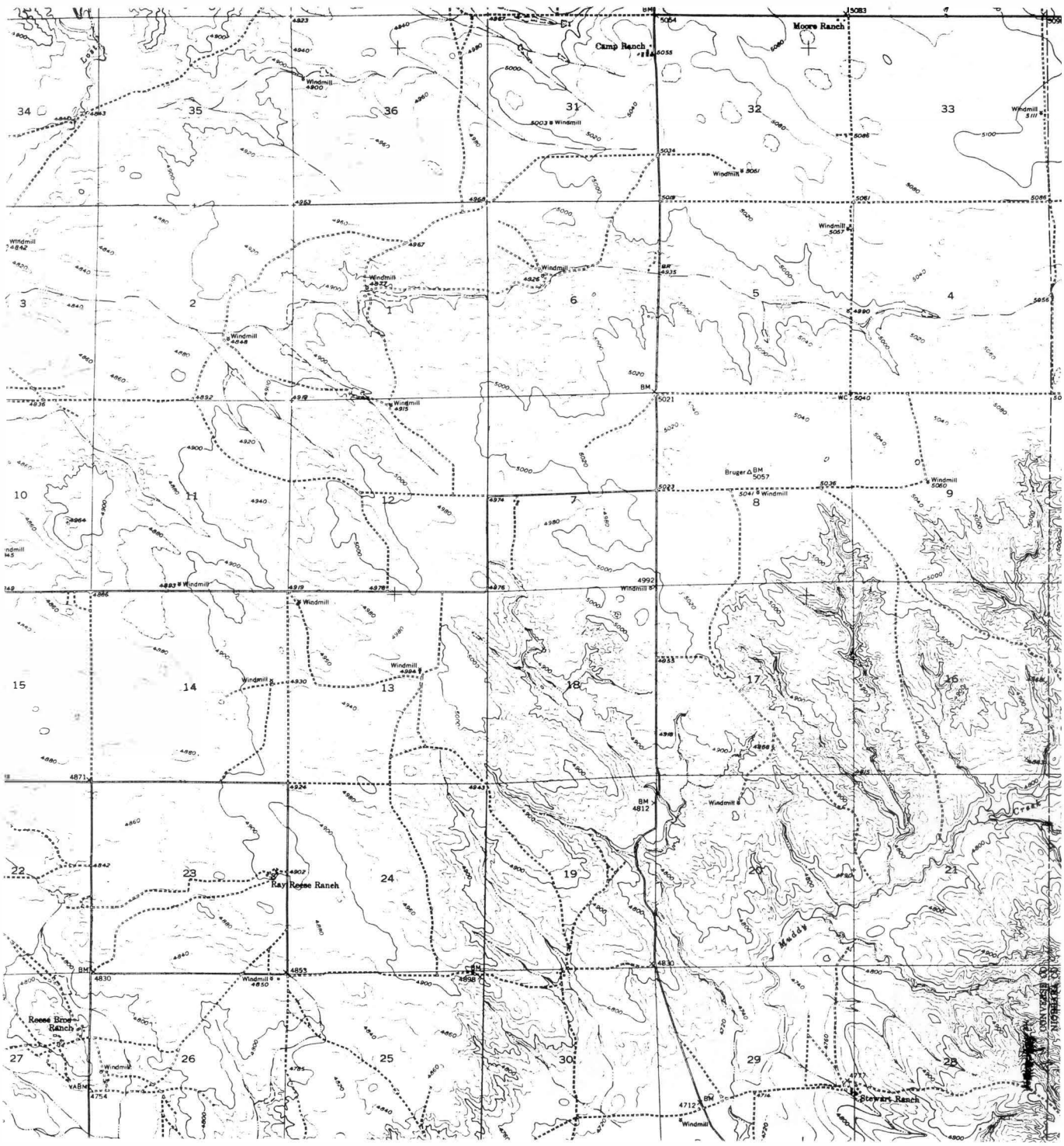
To begin with, many Americans' worldview is not unlike that of ranchers and range managers. They perceive the natural environment as a "resource base" to be manipulated for human goals. So, on those few occasions when they consider range development at all, most people support it if there is any alleged benefit.

Moreover, the average American understands the environmental effects of range development no more than those of livestock grazing, and for many of the same reasons. Most of it takes place out on the range, on the rarely visited half of the West. Similar to overgrazing, the impacts from many of these developments and activities are widely dispersed, subtle, insidious, and cumulative. Those that *are* recognized generally are accepted as rustic parts of the Old West -- the nostalgic barbed wire fences, the stoic windmills, the rugged dirt roads, the exciting roundups, the macho ropings and brandings, and, of course, the pastoral cattle and sheep -- all the stuff of romantic cowboy legends. And, even on a range where there is no discernable ranching impact whatsoever (a rare place indeed), there usually is a profound unseen influence nonetheless. Predator and competitor eradication efforts may have eliminated some native animals; the presence of ranchers and their stock may interefere with normal wildlife behavior; various ranching activities may have introduced harmful exotic vegetation; and so on.

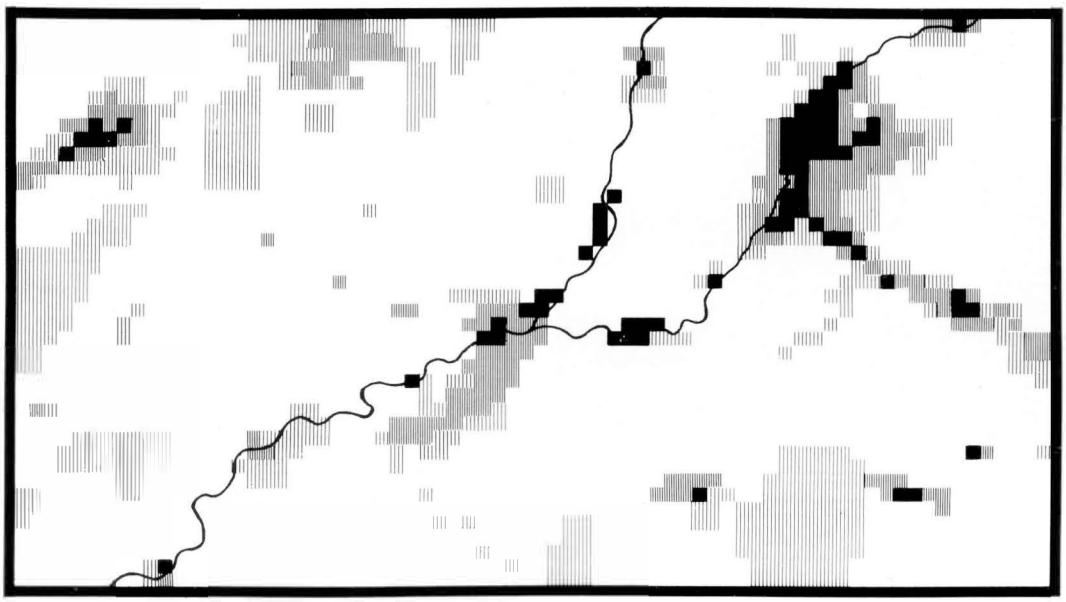


Ranching developments such as roads, fences, and salt enable livestock to occupy and degrade all of the BLM sage country seen in this photo taken near Big Piney, Wyoming. *(George Robbins Photo, Jackson, WY)*

Most of the public has likewise been duped into thinking that range developments -- fences, tanks, roads, vegetation removals, seedings, prescribed burns, predator "control," and so on -- are primarily to benefit wildlife, soil, water, and the public. They have no idea that: 30,000 public lands ranchers are spread evenly across 41% of the West; each is doing whatever he can to develop "his" average 12,000-acre grazing allotment for livestock; and thus each is doing significant environmental damage. Assisting them are about 700 Forest Service ranger and BLM resource area district offices, a dozen other federal agencies, and scores of state agencies, hundreds of county ranching-related programs, and countless private entities. In terms of distribution and diversity of impacts, ranching surpasses any other Western land use; in cumulate environmental damage, it far outweighs any other public land use. As with livestock grazing, ranching developments are nickle-and-diming the West to death.



More of the West is developed for ranching than for any other purpose. This section of a USGS topo map reflects a 30-square-mile area of typical Wyoming range: scattered ranch headquarters, ranching roads accessing every square mile, numerous windmills and stock tanks. Even so, most ranching developments are not shown.



COMBINED NON-RANCHING HUMAN IMPACT -- AVERAGE WESTERN COUNTY, USA
TOTAL ENVIRONMENTAL IMPACT -- 1,000 POINTS

AVERAGE WESTERN COUNTY, USA

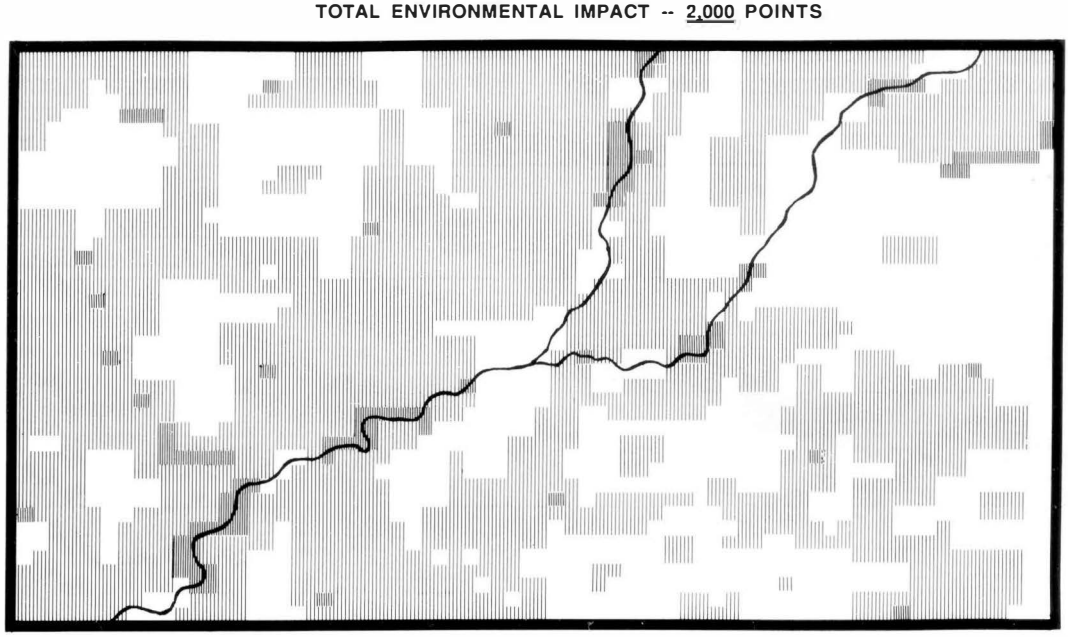
These maps portray stylized versions of hypothetical environmental damage in a fairly average rural Western County, the map above from non-ranching activities, the one below from ranching. Though non-ranching impacts stand out much more starkly and overall damage may *seem* worse, damage from ranching is actually twice as great.

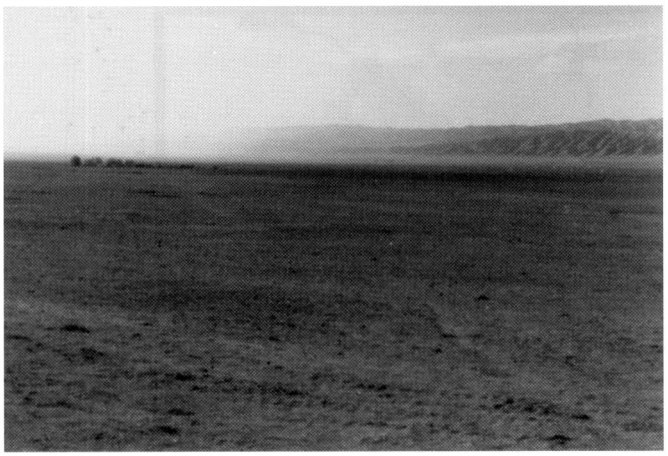
10 miles

DEGREE OF ENVIRONMENTAL IMPACT

Light Impact (0 points)	(Light or no ranching; tourist and visitor impacts: light hunting, heavy gathering; light ORV use; most acid rain; etc.)
Medium Impact (1 point)	(Medium ranching; select logging; heavy woodcutting; medium roading; medium ORV use; overhunting; utility lines; etc.
Heavy Impact (2 points)	(Heavy ranching; clearcutting; light development heavy roading; heavy ORV use; most farming; serious toxic spills; etc.
Extreme Impact (3 points)	(Cities and towns; most development; strip mines; dams and reservoirs; use of nuclear weapons; etc.)

RANCHING IMPACT -- AVERAGE WESTERN COUNTY, USA:
TOTAL ENVIRONMENTAL IMPACT -- 2,000 POINTS





The cattle ranch at left may be likened to a deadly parasite, slowly sucking life from tens of thousands of acres around it.

What we call "news" consists of crises -- sharply focused occurrences that are easy to report. Chronic, time-extended happenings don't have much chance when competing for time or space in the evening broadcast or morning newspaper.
--Dr. Garrett Hardin, "Sheer Numbers," *E* magazine (Nov/Dec 1990)

Compounding the lack of understanding, like overgrazing most range development is less an event than a process -- *a dynamic state of degradation*. We notice the obvious, destructive events, but not the subtle, ongoing impairment of the land. For example, it's not the past massacre of tens of billions of prairie dogs that is now most significant, but that killing thousands of prairie dogs every year (coupled with continued overgrazing) persistently keeps the animal from recovering. It's not so much that half a million miles of ranching roads were made on public land as that these roads are continually used and maintained and that each year more are built. As expressed by CNN news anchor Bernard Shaw, "there's often no daily development -- or, in news jargon, a peg -- to justify spending time on a story that will remain just as timely tomorrow, next week, or next year."

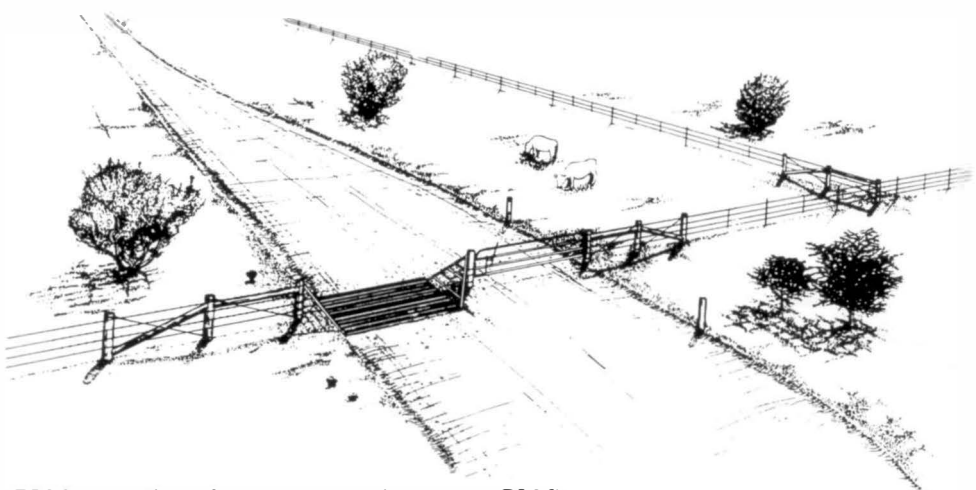
Unfortunately, many of us have a limited understanding of Nature. For example, we suffer from "park mentality" -- the belief that the ideal natural landscape resembles a well-manicured city park, with widely scattered trees devoid of lower branches, with a few, trim bushes, no organic ground litter, and short grass throughout. By claiming to be trying to create a similar landscape, range developers garner public support. But, like developed ranges, city parks are artificial, simplified, non-functional environments, maintained only through intensive management and the continued infusion of resources. We fail to realize that a wild, scruffy, teeming, untamed natural landscape is far more healthy, productive, diverse, and self-sustaining than any green, pretty city park.

With a lack of understanding or interest in the Western environment -- rangeland in particular -- the public defers judgement on range matters to "the range experts," who have thus essentially had free reign to develop public land for ranching.

In practice, stockmen, government range personnel, and private range professionals -- not the the public -- decide how most of our public land is managed. *(Paul Hirt)*

Basically, range development is the manipulation of livestock and the land for ranching purposes. From the combined environmental impact described thus far in this book, it almost could be said that *range development is the attempt to minimize all living things but livestock and their food plants*. With enough labor, materials, tax money, and environmental manipulation, nearly any place can be forced to produce livestock.

Range development, however, is more than simply a means of producing livestock. It is the physical manifestation of a millennia-old stock-man worldview which presumes that "mankind" is endowed by a god with dictatorial power over the Earth (see the end of Chapter XI). Thus, range development encompasses not only physical efforts to increase livestock profits but also deeply ingrained feelings and perspectives. Regardless of how destructive, wasteful, or even ineffectual range development might be, it will continue to be widely practiced by ranchmen so long as they remain in power.



BLM conception of a proper, park-like range. *(BLM)*

Management is our business.
--BLM

Our government land managers generally share the aforementioned worldview, though they manifest it somewhat differently. Their self-declared primary function is *management*, and they aim to *manage*. The more the land is used, the more management is needed from the bureaucracies and the more influence they accumulate. Thus, administrators become nervous when land they "administer" is not being used, even for something as impractical as ranching.

So they manage under the doctrine of "multiple use" and regard public acres as so many slices of pie to be divided among "the users." Since ranching is the traditional and priority use on most public land -- and the only "significant" use on probably half of public land -- the agencies are terrified at the thought of ranching's abolishment. Without it, their basis for control over most land and much of their reason for existence would vanish. This helps explain why they so heavily and blindly support ranching regardless of the consequences.

Conversely, the more the land is developed, the more use it receives and the more administrative power the agencies acquire. The agencies therefore promote range development whenever and wherever possible -- causing the exploitation of tens of millions of acres that otherwise would experience little manipulation.

I'd begin by reducing the number of cattle on public lands. Not that range managers would go along with it, of course. In their eyes, and in the eyes of the livestock associations they work for, cutting down on the number of cattle is the worst possible solution -- an impossible solution. So they propose all kinds of gimmicks. More cross-fencing. More wells and ponds so that more land can be exploited. These proposals are basically a maneuver by the Forest Service and the BLM to appease their critics without offending their real bosses in the beef industry.
--Edward Abbey "Even the Bad Guys Wear White Hats" (Abbey 1986)

****** NEWS FLASH ******

[This bulletin just in:]

An environmental disaster of enormous proportions has hit the Western United States. Reporters say witnesses stared in disbelief, shocked by the magnitude of the damage done in a mere 24 hours. Some of the highlights:

- **On hundreds of square miles almost everything near ground level was broken apart and hurled chaotically about -- even the soil itself in many areas.**
- **Experts estimate that the catastrophe removed 20,000 tons of vegetation from the land, while an equal amount was left broken and scattered.**
- **Witnesses said that wild animals died by the thousands and survivors desperately sought what scant food and cover remained. They stated that thousands more "seem to have been killed intentionally."**
- **An estimated 1 million tons of topsoil were displaced, washed, or blown away during the cataclysm, fouling waterways throughout the West. Additionally, a 5-square-mile area was so thoroughly ravaged that one spectator observed, "It looks like someone bulldozed it!"**
- **Hundreds of millions of gallons of surface water were lost, and some springs and streams vanished entirely. An estimated 1000 tons of harmful excretory wastes were discharged into remaining water sources, causing 20-30 persons to become ill.**
- **Authorities are predicting that monetary damages in lost resources for human use will total in the millions of dollars; other impacts have not yet been calculated.**
- **Unbelievably, federal disaster experts state that disasters of equal magnitude are expected to occur *each and every day for the next 120 years*, as they have for the past 120 years.**

****** NEWS FLASH ******

Now, in the late 20th century, ranchers/range managers fall into 2 seemingly divergent, though actually very similar, philosophical molds. The "old-timers" are still prone to beat the range into submission, like they've done for decades, like they'd break a wild horse. They see the land as theirs by right of manifest destiny, tradition, and the innate superiority of ranching. They believe Nature was created specifically for human use, that the world is a collection of resources, and that their challenge is to bring it under control for their benefit. They live in a self-absorbed, anthropocentric world where all entities within their realm are subject to their control or influence.

The "new-timers" deduce that if brute force won't work, they will outwit Nature (and the public). Through scientific knowledge and technological power, they *manipulate* the range into submission, like a test-tube experiment. They see control of the land as theirs by right of innate human superiority, intelligence, and technological capability. They believe Nature should serve those who have learned to manipulate it. Indeed, they don't believe there is such a thing as natural, but that the world is a huge, complex piece of clay, and they the sculptors. They see the planet as "Spaceship Earth*," and their ultimate challenge as learning how to operate it to produce and extract the desired resources.

*RELATED TRIVIA NOTE: Ferdinand Marcos left the book **Operating Manual for Spaceship Earth** halfway read on his nightstand when he fled the Philippines.

The new-timers are, of course, gradually replacing the old-timers. They peddle the new-and-improved, scientific, ecologically based range development, said to be the answer to all our ranching problems. Science and technology, they tell us, is the secret to benign exploitation. Scientific discoveries will enable us to apply advanced technological solutions to range problems and restore the West -- even beyond its aboriginal productivity!

In reality, these supposedly revolutionary new scientific discoveries are long-known ecological principles that the ranching establishment recently has discovered and learned to utilize to more fully exploit the range and the public.

The more edge effect a particular area has, the higher the wildlife population, because most wildlife species require several types of vegetation to meet their needs.
--**Range Management** (Holechek 1989)

Thus, for example, government agencies -- to the bewilderment of many conservationists -- nowadays often justify their range development practices by "managing for maximum diversity." Agency range professionals claim that when they manipulate the vegetation cover, the edges of the disturbed areas support animals from both of the adjoining habitats, as well as animals that need both kinds of habitat, and other animals that specialize on edges. Supposedly, these transition zones provide for greater overall numbers and diversity of wildlife than if the vegetation was not manipulated. This is known as "edge effect," and according to its promoters it simulates Nature's mosaic effect. Pretending that more edges mean more diversity -- and fully aware that "managing for maximum diversity" means greater support from conservationists, as well as, usually, more forage for livestock -- the agencies manage for maximum edge effect.

Some [brush control] *projects in the past were carried out with little regard for wildlife, but now most are designed to produce a mosaic of vegetation types, thereby increasing grass production but leaving strips or islands of brush for wildlife cover.*
--from *Progressive Agriculture* by the College of Agriculture, University of Arizona

The agencies argue that managing for maximum intensity and variety of disturbance produces maximum edge effect and therefore maximum diversity of habitat and wildlife. So they cavalierly herbicide strips through brushland, chain wide swaths through pinyon/juniper, prescribe burn segments of rangeland, promote logging and firewood cutting on mesas and ridges, plant seedings in bizarre designs, allow intensive goat and sheep herding in selected areas, and so on -- all under the wide, protective umbrella of "managing for maximum diversity." Of course, all this gives the bureaucracies the appearance of doing something useful.

Conservationists and others have been fooled and confused about diversity. Nature already "manages" ecosystems for optimal mosaic and edge benefit. Additional mosaics and edges increasingly detract from overall ecosystem health.

Moreover, the impacts of machines, herbicides, unnatural fires, exotic plants, livestock, and humans are vastly dissimilar to Nature's forces. The kinds of species that benefit most from these artificial intrusions are plant and animal "weeds." While indigenous species may be reduced or extirpated, these exotic and increaser species may thrive in human-altered landscapes, sometimes causing, at least temporarily, an overall increase in diversity in the disturbed areas. This type of management, with its countless, inherent unforeseen variables, often produces not even weeds but bare dirt, soil erosion, water siltation, wildlife declines, and so forth.

Furthermore, unlike most natural disturbances, artificial disturbances often adversely affect the interior of adjacent unaltered habitats. For example, the microclimates created by numerous artificially disturbed areas often reach well into nearby undisturbed areas and, in combination, may cause significant harmful changes in wind, humidity, temperature, etc. Likewise, predators, disease, parasites, and pathogens introduced from these artificial edges may harm interior wildlife. Edge effect management may or may not increase species diversity along edges, but nearly always it causes species declines to interiors.

Also, with intensive management for edge effect, native plants in undisturbed areas tend to disappear under an onslaught of exotics (often seeded intentionally) from the numerous edges. This reduces species diversity on a broader scale since the same weedy species tend to occur over and over.


An artificial mosaic on northern Arizona BLM range. Marble Canyon is in the background.

Large blocks of habitat support more species than comparable smaller blocks totaling the same size. Many plant and animal species need large blocks of undisturbed land, and management for too much edge effect fragments their habitat. Studies in Brazil show that rainforest fragmented into 2 1/2-acre blocks is all edge, and even 250-acre blocks are 25% edge. Fragmentation is a main dynamic behind deterioration of habitat (see **Conservation Biology**, edited by Michael E. Soule, for a discussion of habitat fragmentation and edge effect).

All range developments, especially ranching roads, firebreaks, fences, seedings, vegetation eradications, prescribed burns, livestock

management activities, sacrifice areas, heavy grazing, and livestock, increase habitat fragmentation. Most range developments require road building, which not only further damages and fragments habitat, but brings in more people. Further, once an area has been artificially altered, it must continue to be periodically redeveloped essentially forever to maintain its artificial state, for it will always strive to return to a natural state. Finally, the increased livestock grazing following these unnatural alterations often is the greatest detriment of all.

Human management does not create healthy ecosystems. Only natural disturbances, the products of Earth's evolution over millennia, can create natural abundance and diversity with an appropriate mix and interaction of species. Reed Noss, a landscape ecologist, expresses this concept well:

> *The ecological mosaic created by natural disturbance is a far cry from the checkerboard of isolated habitats created by modern humans. The natural mosaic is interconnected; the artificial patchwork is fragmented. . . . What we want is a full complement of native species in natural patterns of abundance.* (Noss 1986)

> *As development continues to encroach on the natural world, naturalists and conservationists are continually called upon to answer the question, But what good is it* [a given species]*? . . . . Ecologist Marston Bates has suggested that the best response the naturalist can give to the question is to ask, What good are you?*
> --from **The Nature of Birds** by Adrian Forsyth

> *The only truly useless species is one that has become extinct.*
> --G. Jon Roush, "The Disintegrating Web," *The Nature Conservancy Magazine* (Nov/Dec 1989)

When a hurricane, tornado, avalanche, fire, clearcut, concentration of cattle, or other major disturbance changes a landscape, a dramatic shift in available nutrients may occur to certain favored species. In the case of a tornado, trees and brush may be uprooted, torn to pieces, and distributed about the landscape as organic litter, resulting in an increase in sunlight and soil nutrients to forb and grass species, eventually providing more food for, say, rabbits. In other words, the nutrients in the destroyed vegetation are redistributed to surviving and future plants and, in turn, to their dependent animal species. These species may then experience dramatic, albeit temporary, population increases.

Range managers have learned that by manipulating certain influences they may redistribute ecosystem nutrients, including sunlight, to favor selected species, usually forage grasses and livestock. This is a basis of modern range management and one of the secrets of how range managers can sometimes seem to magically produce certain plants and animals. Their tools include vegetation eradication, prescribed burns, intensive livestock herding, and so forth.

Consider a common scenario: a northeastern New Mexico valley is covered mostly with shrubs, the spaces between them showing exotic grasses and bare dirt. The local permittee pressures BLM to disc 800 acres. The shrubs are reduced to organic litter and, along with the existing litter layer and grass, are incorporated into the topsoil. Suddenly, soil nutrients, humus, microbes, and aeration increase. Now, if sufficient moisture follows and temperatures and other variables happen to align, the exotic grass seeds in the churned up soil sprout and thrive, yielding a net increase in grass. The rancher is happy (at least for awhile), and BLM toots its horn.

Fortunately, Nature is not so easily enslaved. These variables rarely align to produce a best-case scenario. Rain may not come; the grasses may not have seeded well the preceding spring; pests may thrive in the simplified community and eat most of the seeds or seedlings; or storms may wash away the temporarily unprotected soil.

Perhaps more important, what increases do occur are usually *short-lived*. Often within a few years, as nutrients redistribute to recovering members of the ecosystem, they gradually move to lower levels than before implementation of the range development. A natural climax community -- or what passes for one while being overgrazed -- begins to reestablish itself.

On the same 800 acres before discing, organic material from the shrubs and grasses was released slowly and relatively evenly over time, providing the soil a continuous nutrient supply. When discing released the entire biomass of the 800 acres into the soil at once, humus dramatically increased. But over the next few years, this humus decomposed and new growth could not replenish it as had the original vegetation, especially while being grazed by livestock. Consequently, the humus eventually fell below original levels, grasses declined, and shrubs once again achieved dominance -- *with a net loss in ecosystem biomass and diversity*.

But, ranchers do not want this to happen. They want grass. So, they keep killing, burning, seeding, and herding, hoping and gambling they can maintain forage artificially, *while their livestock relentlessly counteract their efforts*.

This redistribution of rangeland nutrients for short-term increases in productivity is similar to what is happening all over the planet. Oil and mining companies "unlock" non-renewable resources and call it "progress." Timber interests cut aboriginal forests that will never recover their natural abundance and diversity. Farmers large and small take from the earth more than they return. And fishing outfits take maximum hauls from a finite ocean. Ranching makes Western range just as much a non-renewable resource.

> *I wanted to create a place where living things could thrive, when all the while I was killing the life that was there.*
> --from *Star Trek, the Next Generation* TV series

Under the influence of ranching, Western range productivity has been declining steadily for more than a century. Thus, to maintain traditional livestock levels the industry has been forced to "restore the range." This is *not* true range restoration, but attempted *forage* restoration -- another form of range development. In fact, most of the alleged "restoration" techniques are identical to the range developments discussed in this book. Under this banner of "restoring the range," the industry is developing the West for ranching even beyond previous levels of exploitation.

This is analogous to building taller smokestacks to reduce air pollution. True restoration would be a temporary effort -- to return "management power" to Nature so that future restoration would be unnecessary. True restoration would

break the endless snowballing cycle of restoration-overgrazing-restoration-overgrazing.... True restoration would entail not only restoration techniques, but elimination of the ultimate cause of deterioration -- ranching. Range "improvements" treat the symptoms, not the cause.

Further obscuring their motives, the range controllers claim that their "restoration" efforts are vital to many rangelands because environmental damage has progressed beyond the point of natural regeneration. Not only this, because humans have irreversibly changed the land, they must henceforth take *permanent* control over natural processes.

Well, slow down! This theory has far-reaching implications. Are we to believe that after 5 billion years of natural existence the Earth suddenly cannot survive without eternal human supervision and maintenance? If this is the direction in which we are headed, won't the Earth ultimately be turned into a huge, complex human experiment? What kind of future would it be if humans determine every aspect of Earthly existence? What person has the knowledge or wisdom to direct the lives of trillions of diverse beings, their infinite number of interrelationships, and incredibly complex ecosystem dynamics? As writer/ecologist George Wuerthner writes, "Even our most complex inventions, such as spaceships and computers, are, by comparison to natural systems and processes, incredibly simple." And as ecologist Frank Egler points out, "Nature is not only more complex than we think, but more complex than we can ever think." Ecologist Jamie Sayen expands upon Egler's statement in "Taking Steps Toward a Restoration Ethic":

> *...systems reconstructed by humans are always biologically impoverished relative to similar natural systems, and are always more susceptible to invasion by exotics.*
>
> *Efforts to recreate or replicate damaged ecosystems can never succeed. Even if we knew all the parts (down to the site specific soil microbes and mycorrhizal fungi), we wouldn't begin to understand the web of relations. Furthermore, an undisturbed system today is quite different from what it was 100 or 1,000 years ago. It may have the same appearance, but changes caused by climate, disturbance, succession, adaptation and evolution change it in ways no historian, archaeologist, or ecologist can ever fully know.* (Sayen 1989)

In other words, we cannot restore the Earth. Human interference with natural processes can only detract. We can only put back available missing pieces, stand back, and let Nature heal.

I firmly think that the vast bulk of degraded Western rangeland is capable of natural restoration if protected from further damage and given enough time. Most areas will heal surprisingly well, as has been demonstrated by the hundreds of sites around the West where ranching has been terminated. Harold Dregne of Texas Tech University reports in the UN's *Desertification Control Bulletin* (#15, 1987), "Enclosure studies around the world have demonstrated the potential for recovery of overgrazed and drought-affected pastoral lands, even during droughts." Unfortunately, humans are impatient, especially when clamoring for more livestock, and some areas may take decades or even centuries to heal.

Some range professionals cite cases where decades of protection from ranching have resulted in "no significant improvement" in range condition. This is misleading. First, they conveniently ignore the vast majority of sites that show much improvement. Second, in most of the cases they cite there *has* been improvement, just not enough to seem "significant" to people who consider little more than livestock production. Often improvement is belittled to promote the impression that ranching is benign. Third, as explained, the size of the protected areas is generally inadequate. Finally, other detracting human influences often are overlooked.

Range professionals also cite instances where restoration projects seem to have improved range conditions. To be sure, there are cases where restoration management has been worth the tax money, effort, and resources expended -- some check dam projects, reintroductions of native grasses, and prescribed burns, for example. But the true successes are few and far between. Most restoration efforts fail to produce the calculated results, or expend more than is justified by the results; nearly all are followed by more of the intensive ranching that necessitated restoration in the first place. Failures go unpublicized, and the "successes" are generally misinterpreted by vested interests.

Artificial restoration should be used only as a last resort, especially when removing the cause of degradation is by itself not enough to reverse deterioration and prevent significant long-term damage. For example, rather than prescribing burns to restore a range, why not let natural fires burn? (Range manager's answer: unplanned fires do not fit into grazing schedules.) To quote Jamie Sayen again:

> *Instead of attempting to control evolution or create ecosystems, we should work to restore the possibility of the evolutionary dance. We must rely upon the resiliency of Mother Earth, not on our species' cleverness."* (Sayen 1989)

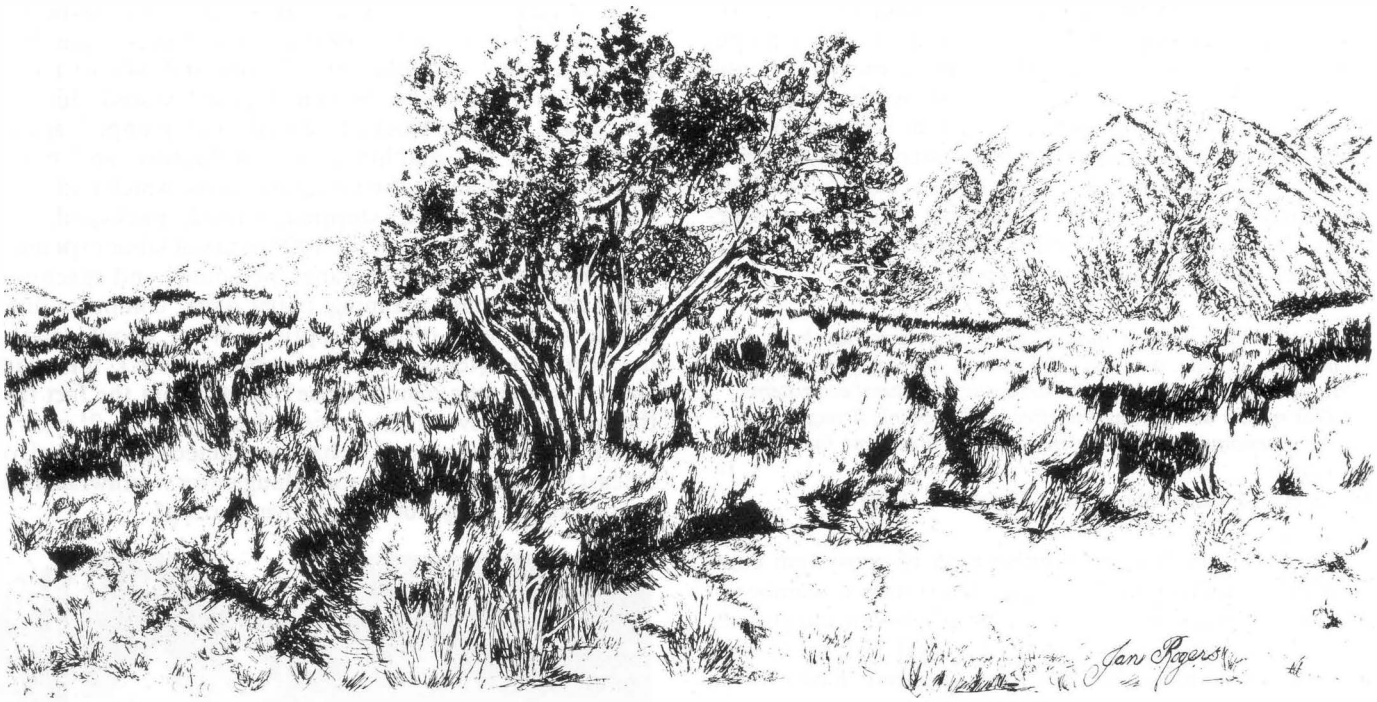
Many professionals use range studies to promote range development. Out of thousands of existing studies they carefully select a handful that "prove" what they want to prove -- that a preferred type of grazing system or range management improves range conditions, or minimizes decline. Or, they simply conduct their own relevant studies. The integrity of many of the studies is in doubt, but perhaps more importantly, most of the alleged "improvements" could not be made without infusions of outside labor, capital, and materials.

Nonetheless, they trumpet their "successes" as proof that there really are ways to raise livestock on the Western range without ruining it. Many of these ranching advocates claim to have discovered the magic scientific formula which if implemented on a large scale might save Western ranching.

These pros are often convincing, but their claims have little basis in reality. You cannot pick a few results from thousands of studies and claim them indicative of ranching in general. Likewise, because a certain method produced an apparent improvement under a unique situation does not mean that method will do the same elsewhere on the Western range.

Nearly every conceivable kind and combination of grazing and range development has been explored over the years. Yet the West remains in poor condition.

> *A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.*
> --Aldo Leopold



An artist's depiction of unranched range in Douglas County, Nevada. *(Jan Rogers)*

Range development is an attempt to circumvent natural processes and subvert Nature for human purposes. One illusion held in range professional circles is that the more ecological knowledge you gather, the more control you can exert over the land and the more it will conform to your goals.

Consider the infamous Dust Bowl disaster of the 1930s. The farmers' attempt to force the shortgrass prairie to produce crops was ultimately as destructive and futile as the ranchers' attempt to force public land to produce livestock. In fact, though we rarely read of it in history books, overgrazing was not far behind farming as a cause of the Dust Bowl, and ruinous overgrazing continued throughout the ravaged 80,000-square-mile area of Kansas, Colorado, New Mexico, Oklahoma, and Texas even after thousands of farmers gave up farming and left. Vegetation cover on grazed Dust Bowl lands was reduced by at least 50%, frequently by 90%-98%, and the government provided emergency relief to ship thousands of starving cattle east to the tallgrass prairie. (Malin 1956, Vankat 1979) Scientists indicate an increasing likelihood of new farm-belt dust bowls, but large areas of overgrazed Western range have resembled dust bowls for decades.

This photo shows the edge of a range revegetation project, Gallatin National Forest, Montana. Increasingly intensive range manipulation puts humans in the improper position of dictating the nature of Nature *(USFS)*

The land has already been developed by Nature to its full potential.
--Ian Sinclair, **Live and Let Live**

We humans have come to think that we can do a better job of managing the land than the land itself can. Despite what we think, only Nature "manages" the environment appropriately; people can only *manipulate* it. Consider, for example, that studies show a single acre of grassland supports about 4 million invertebrates large enough to be seen with the unaided eye. Also on this acre may be hundreds of vertebrates, billions of microscopic organisms, and millions of plants of scores of species. Add to this the complex relations of sunlight, soil, water, mineral cycles, weather, and more. Though constantly evolving and dynamically changing in infinite ways, this assemblage exists together for millennia, to the overall benefit of nearly all participants. How can we better manage this acre, regardless of our intentions or how hard we try?

Nature already has provided the most abundant, diverse ecosystem possible for each unique set of climatic, geographic, geologic, and hydrologic conditions. It is the ultimate expert, having been working not for mere hundreds, but for *billions* of years. Scientists estimate that Nature has created more than *4 billion* different species since life began.

Even the simplest ecosystem is so incredibly complex that no person could begin to understand it, much less manage it appropriately. As the trillions of cells in our bodies function as one, similarly do the infinite components of natural systems. In our ignorance and conceit, we think we can function as the "brain" to manipulate the Earth, not realizing that the brain is actually the composite whole.

Yet, on occasion wildlife will be *less* abundant and diverse on rangeland in its natural state than if intensively manipulated by humans. In this case, the "correct" biosystem is still the natural one, for its very existence shows that in the long run it is the most appropriate biosystem for that environment and within the context of the greater Earth. And even if we were able to increase an ecosystem's overall biologic "productivity," how are we to know that long-term productivity and certain species will not be harmed by our interference? More is not necessarily better.

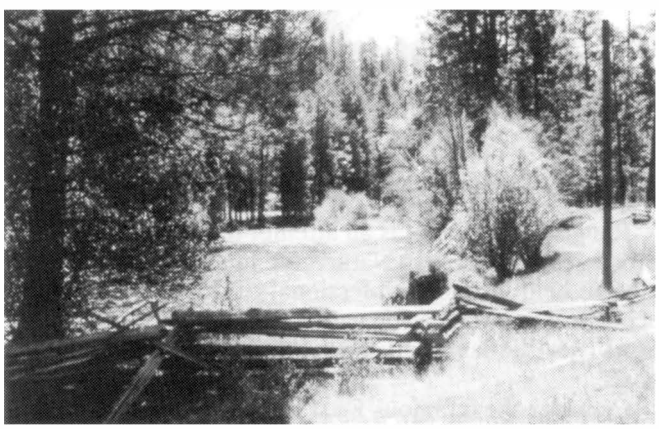
> *It seems that one of man's strongest desires has been to achieve stability: a steady-state system, devoid of the tumultuous ups and downs so characteristic of natural ecosystems. This means dampening the effects of flooding, drought, and fire, phenomena to which most of the flora and fauna are adapted.*
>
> --Steven P. Christman, Ph.D. (Christman 1988)

Moreover, the natural *combination* of ecosystem components is vitally important. The almost infinite number of unique *interrelationships* among and between individuals, species, non-sentient beings, cycles, and systems is what maintains healthy ecosystems. These dynamics have evolved over millions of years and cannot be artificially improved.

Consider the plants composing any Western ecosystem. It may seem that each species is trying to dominate all others. But if this were true, after millions of years of competition between thousands of plant species one species would likely have outcompeted the others in its area and taken over vast territories. Yet after countless millennia of supposed "ruthless competition" nearly every natural area in the West supports remarkably diverse plant communities -- dozens or even hundreds of different kinds of plants living together in complex intermixtures and mosaics. Each specie's welfare is ultimately best served as an integral component of the community. Each provides certain benefits to the whole, as the whole provides for each species -- something like the cooperation between the individual cells of a living being. In turn, each subdivision of an ecosystem -- plant, animal, soil, water, fire, air, mineral, chemical, or whatever -- interacts in ways that benefit the whole ecosystem as well as itself, and each ecosystem functions similarly within the context of the whole Earth, as does the Earth in the context of the solar system, and so on. Humans have lost the reality that we were/are/must be an integral and natural part of all this.

When human interference changes an ecosystem -- and ranching is most insidious in this respect -- these vital interrelationships break down, to the detriment of the individual, the species, the cycle, the system, the ecosystem, and the Earth. Snowballing damage results from the breakdown of naturally occurring interrelationships. In other words, harming the component parts of the environment damages a much greater portion of the whole than the sum of these immediately affected parts.

Further, the ranching establishment presents range development as a wholly positive effort to improve the range, but ignores that the outside materials and the human energy expended could have remained unused or put to better use. Take an average 1000-acre BLM African lovegrass seeding. Is it simply a noble attempt to restore overgrazed range? If the grass takes well, is it necessarily a success? What about the 1000 gallons of diesel, gasoline, and oil used by the bulldozer, tractors, and pick-up trucks -- petroleum that had to be mined, piped, stored, shipped, processed, stored, trucked, stored, and pumped again? What about the machinery's manufacture and maintenance? What about the lovegrass seeds, which had to be harvested, processed, shipped, stored, packaged, and transported? What about the 1000 hours of labor expended directly on the project by range personnel and ranchers? What about agency planning, paper work, computer time, phone calls, and office supplies? What about related developments (fences, roads, firebreaks, etc.), follow-up visits, and seeding maintenance? What about the fact that the area will have to be reseeded every 15 to 25 years? Couldn't all these resources have remained unexploited, or at least have been used for something more worthwhile than preparing the range for further overgrazing?



"Streamside Protection, Deschutes NF, Oregon," according to the Forest Service. The fence has fallen apart. *(USFS)*

Range "improvements" under the continued influence of ranching are innately non-permanent and must be constantly monitored, maintained, replaced, or renewed. As such, and because of their huge financial costs (Chapter VII) and environmental harm, they could more appropriately be called range "burdens."

Nevertheless, we are not given the option of simply removing livestock from our public land. We are forced to keep throwing tax dollars into range development to counteract ranching's inherent destructiveness.

At best, range development is a double-edged sword. While allowing stockmen to partially mitigate the impacts of ranching, it treats the symptoms, not the cause of the destruction. Like an overworked ulcer patient being advised to take antacids instead of changing jobs, it only prolongs the day of reckoning and allows the tumor to continue growing. While allowing stockmen to maintain or increase livestock production, it does so only by creating dependency on ever-larger and more complex management schemes. Like a narcotic addict needing more, ever MORE, getting more only leads to *needing* more.

As with long-vanished civilizations that plundered their resources and destroyed themselves, we are living on borrowed time. For them, it took many centuries of cumulative degradation before they perished. Modern science and technology has given us the ability to manipulate and exploit the environment as never before. For us, it may take only decades. The ranching establishment is "playing god " with 306 million public acres, and the results are proving catastrophic.

As I travel through the United States, I see much evidence of good stewardship in the form of vigorous, high-quality range forage for livestock and high quality habitat for wildlife.

--Joseph L. Schuster, Range Science Department, Texas A & M University (USDA, USDI, CEQ 1979)

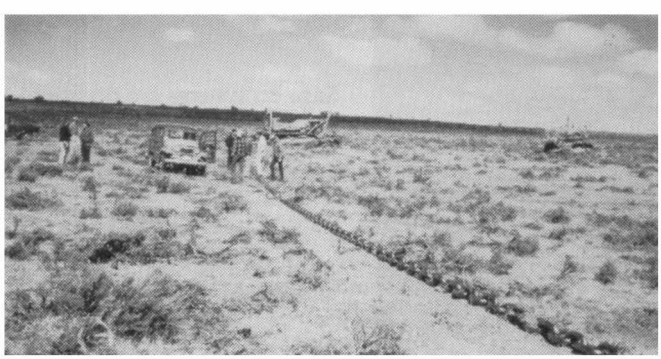
If one considers the full ecological impact of livestock grazing, not just the narrowly defined parameters used by range managers, it is difficult to justify or defend livestock grazing for any reason on public lands.

--George Wuerthner, "Success on the Range"

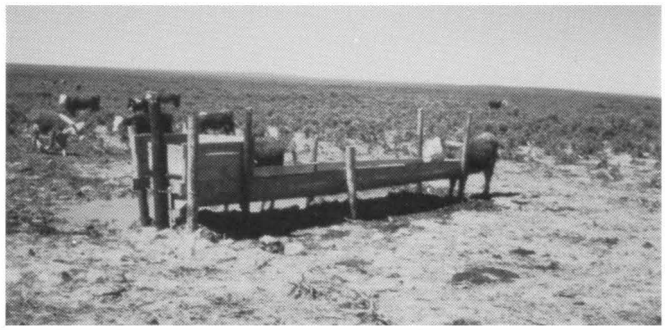
Decades of overgrazing on the fragile, arid ranges has damaged riparian areas, forced out wildlife, threatened endangered species, ruined fisheries and turned large areas of viable range into wasteland. "Grazing on our public lands," says Democratic Representative Mike Synar of Oklahoma, "is producing an ecological and fiscal disaster."

--Michael Satchell, "Last Roundup on the Range?," *US News & World Report* (11-26-90) (Satchell 1990a)

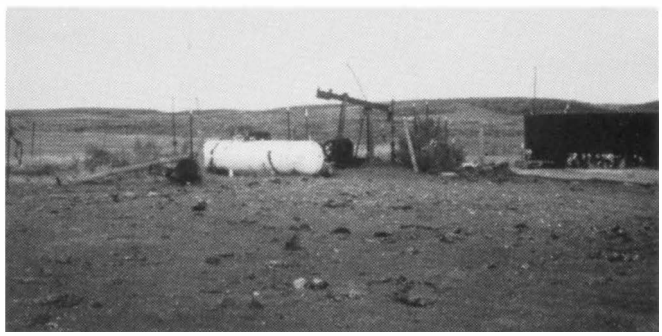
Range Development Photos



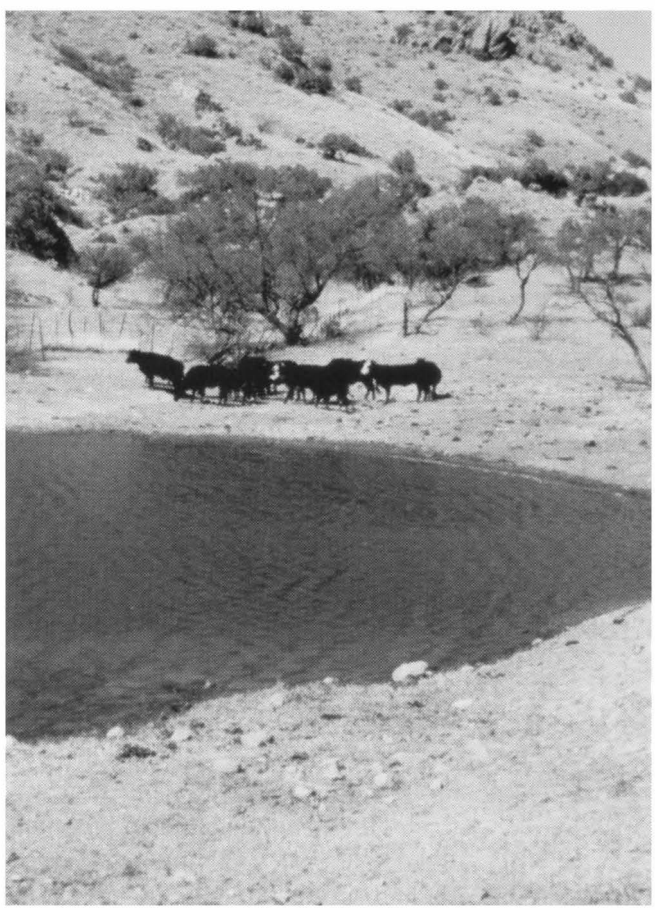
A BLM chaining to rip out shrubs. *(BLM)*



A pipe-filled cattle tank on Nevada BLM land. The wooden box on the left prevents cattle from damaging the float valve. *(BLM)*



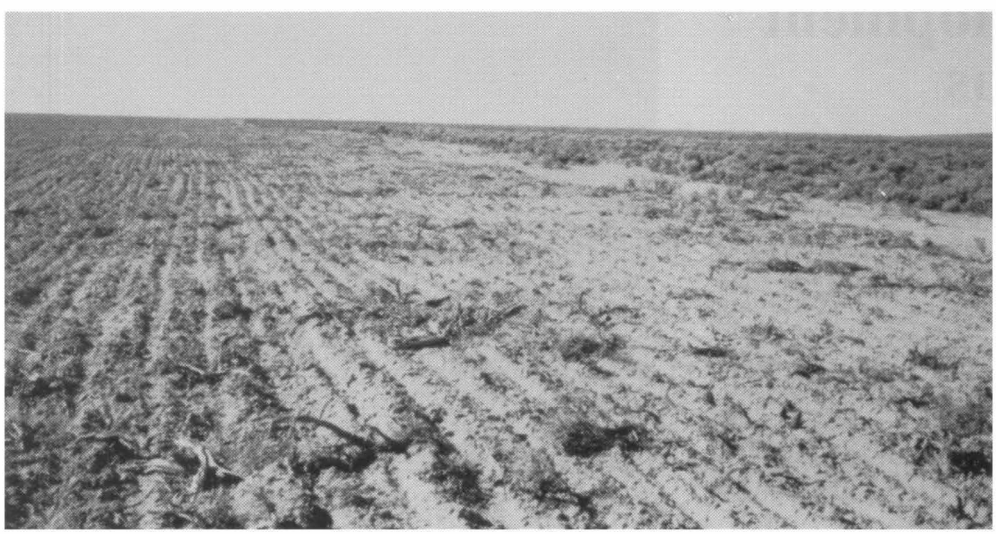
Propane-driven water pump, stock tank, and sacrifice area. *(BLM)*



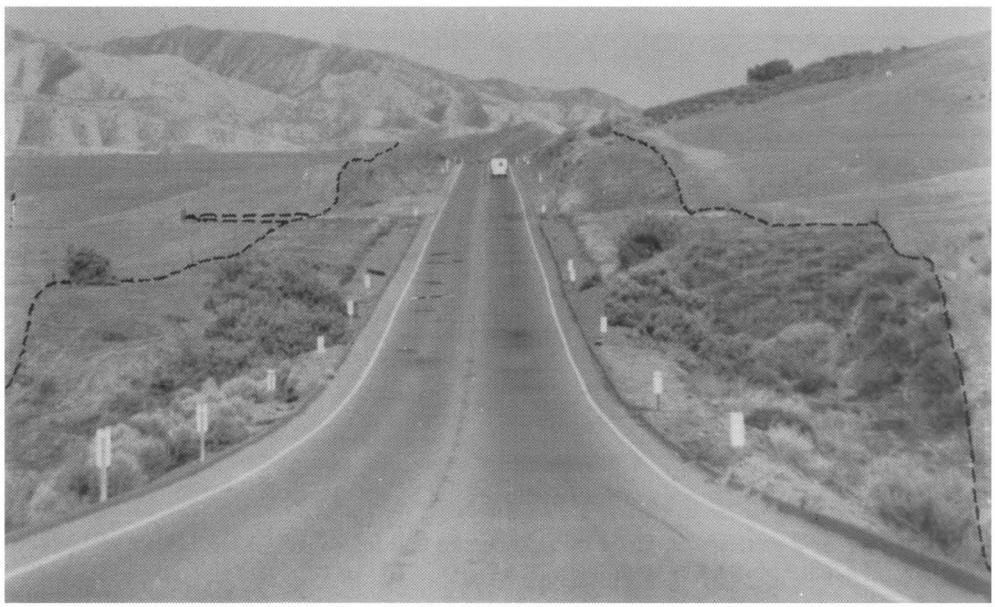
A stock tank sacrifice area in the Coronado National Forest, Arizona. *(Paul Hirt)*

A windmill, metal tanks, corral, pens, ramp, and deteriorated range. BLM, Tembler Range, California.

Water developments and salting allow livestock to survive where they otherwise would not. Note the sacrifice area, cattle trails, degraded range, and fenceline contrast.



Sage ecosystems are destroyed by the hundreds or thousands of acres and seeded with livestock forage grasses. *(Nevada BLM)*

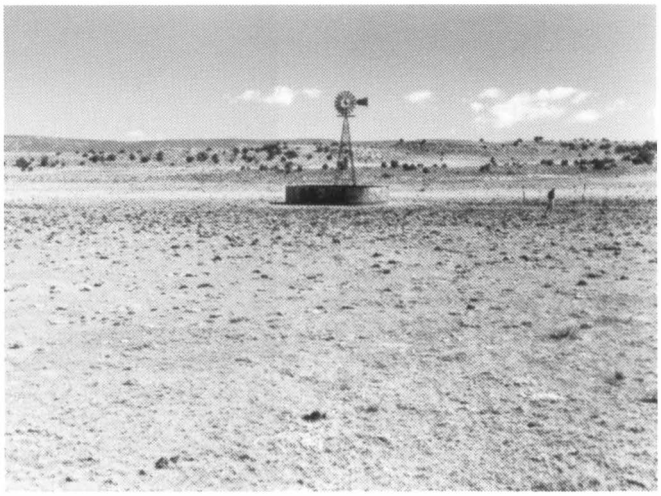


The dashed lines delineate roadside fences. Away from the rights-of-way, nearly all plants but exotic grasses have been excluded or precluded by ranchers and their cattle. A common Western scene.

An obliterated riparian zone runs through the center of the scene. A salt block sacrifice area is at the upper left-center; a ravaged spring area at center right; ranching roads; fences; cattle trails; and heavy grazing throughout. Note the roadside fenceline contrast.

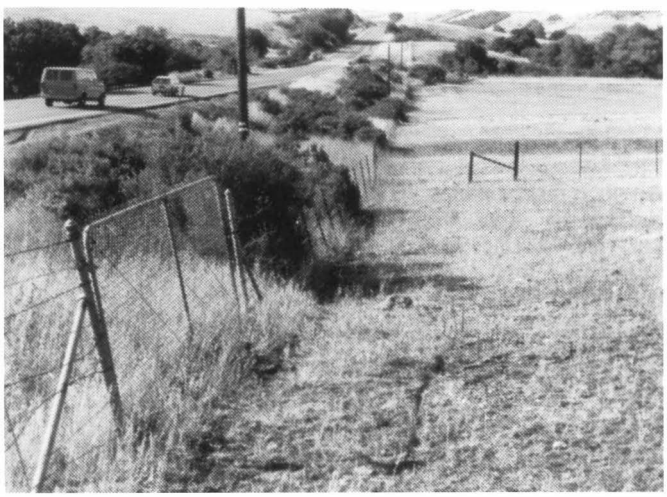
Cattle production in central California.

The remains of a rattlesnake, killed by a stockman and left hanging on a fence post. BLM land.

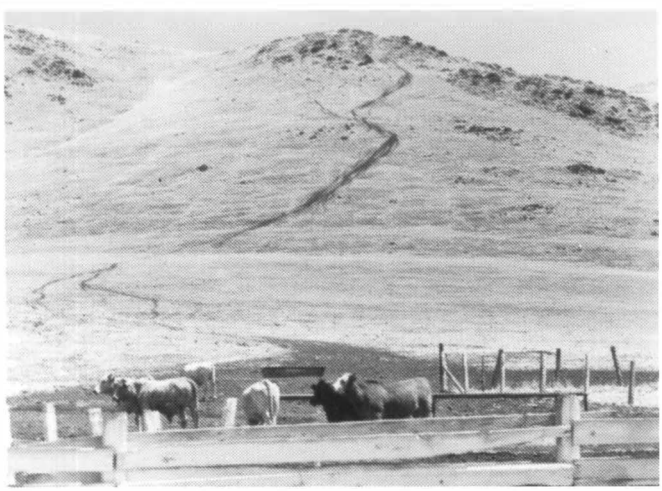


A New Mexico BLM cattle tank sacrifice area littered with cow pies.

A BLM corral and water development. To supply the water pump, the electric line runs for more than a mile across public land.



Dozens of species of healthy, full-sized plants on the ungrazed roadside are reduced to stubbles of only a few species by cattle and their owners on the surrounding ranchland.



Corral, sacrifice area, cattle trails, and depleted range.

A cleared fenceline becomes a cattle trail.

Ranching at 9400' elevation in the Dixie National Forest, southern Utah.

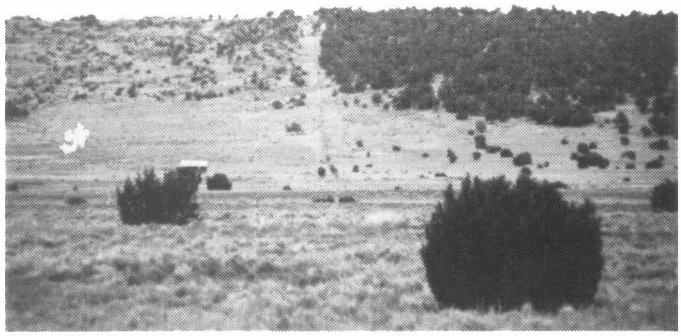
A large Forest Service stock water dam and pond. Note the excavations on the hill, the roads, and the overgrazing. *(USFS)*

Deforested, overgrazed tablelands in the Gila National Forest, New Mexico.

A BLM corral sacrifice area. There are tens of thousands of such corrals and sacrifice areas on our public lands.

Bulldozing brush for ranching on BLM land. *(BLM)*

A stock tank graveyard.

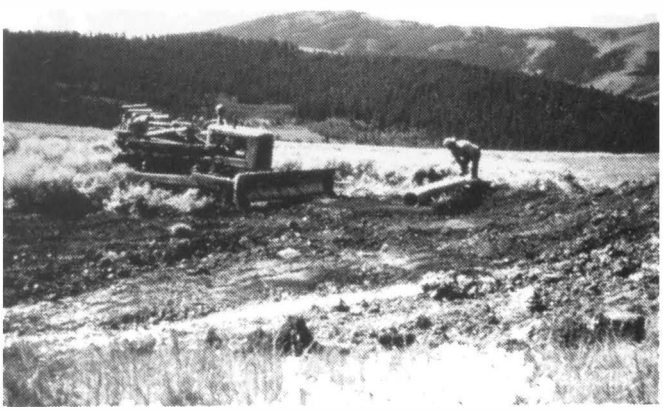


This juniper deforestation for cattle has begun to regrow with juniper. Note the cleared fenceline.

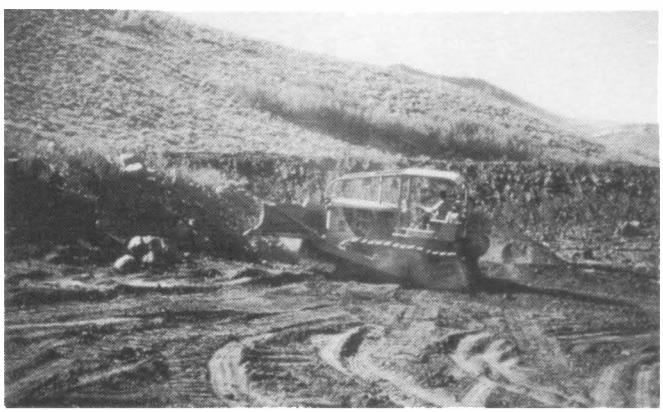
From a capped spring, a pipeline runs for 7000' along this ridge to a cattle trough. *(Idaho BLM)*

A corral, pens, stock scale, and loading ramp on state land.

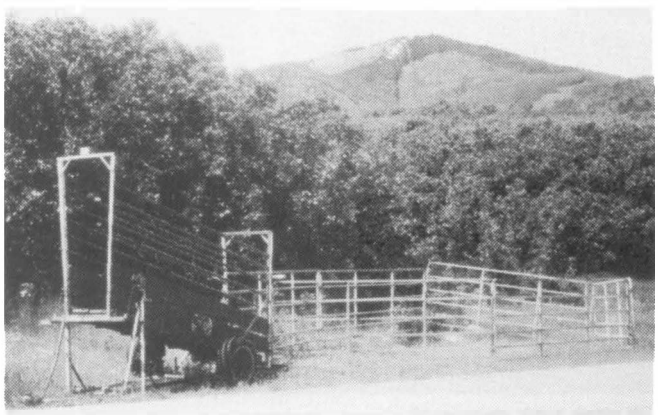
A large stock tank under construction on Montana NF. *(USFS)*



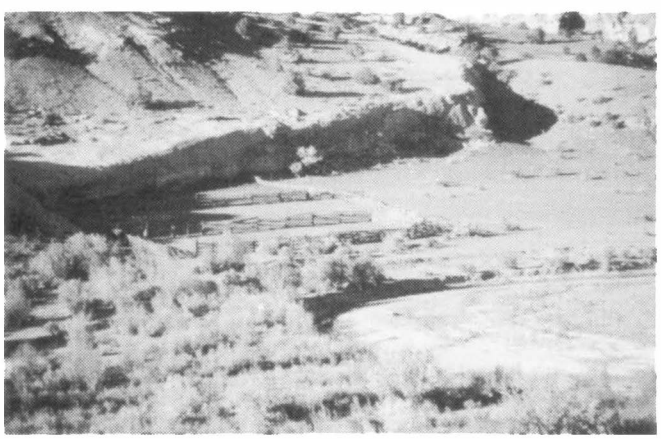
Montana stock water development under construction. *(USFS)*



Bulldozing a BLM stock tank. *(BLM)*



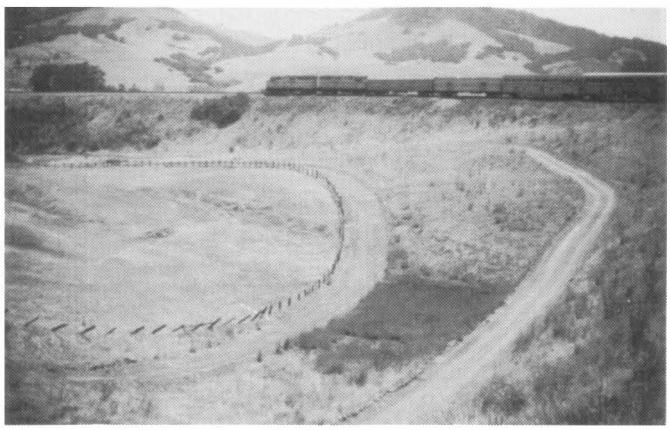
A portable stock ramp and pen, Manti-LaSal NF, Utah.



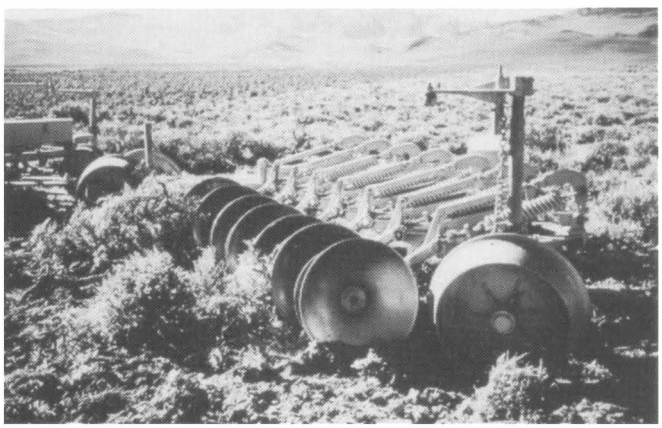
Here, corrals tie directly into cliffs. Heavy grazing throughout.

A very large stock tank on BLM range seeded with exotic forage grasses. *(BLM)*

A 10,000-gallon holding tank, well, well house, pipelines, special utility line, fences, sign, and rancher's trailer. *(BLM)*

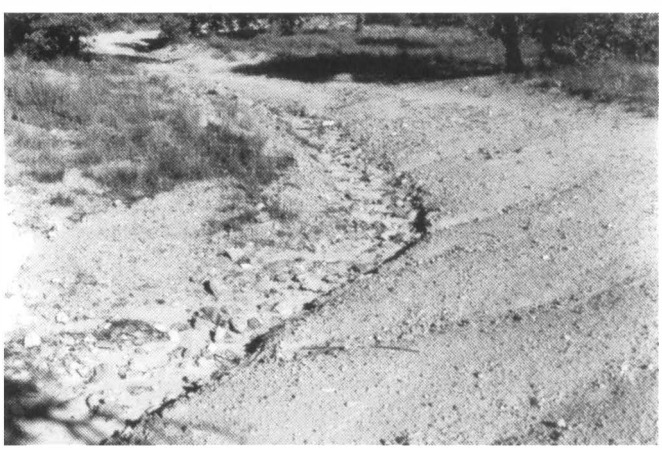


Firebreak, ranching road, fence, deforestation, and overgrazing.

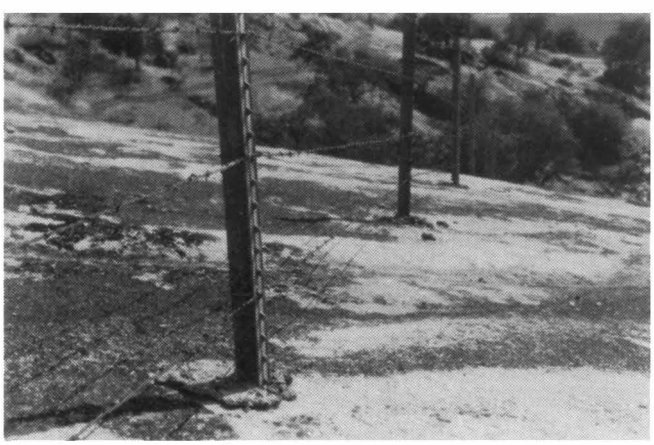


Discing is a hopeless attempt to farm the Western range. *(BLM)*

Grading a firebreak along a freeway to prevent forage fires.



Many ranching roads become eroded drainages.

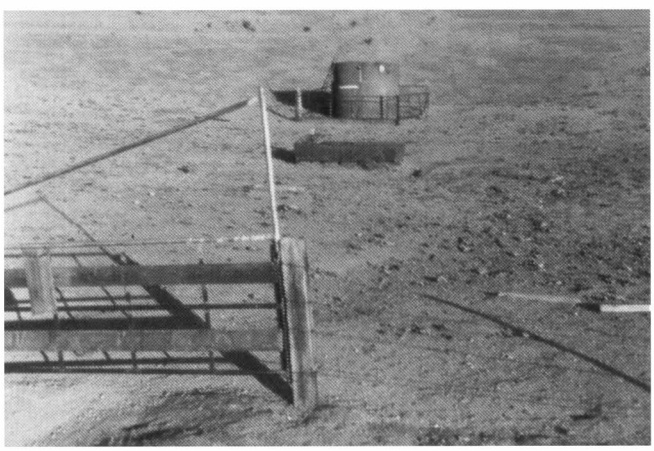


A fence set in bedrock in the Sierra foothills, central California. Fence builders killed most of the cryptogams on the right.

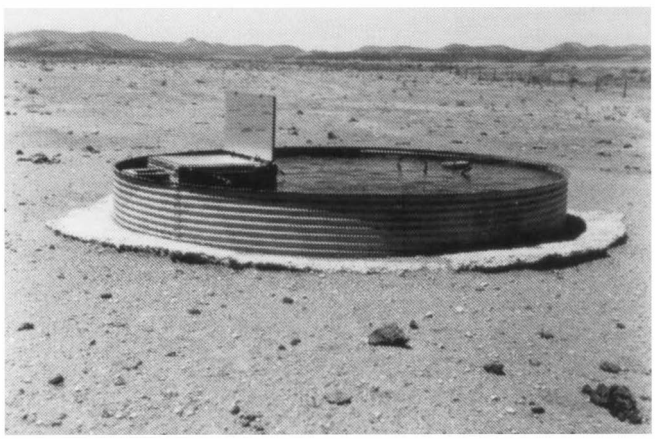
A large stock tank on BLM range in Coconino County, Arizona. Note the size of the van at center-right.

A trailer for hauling horses and cattle. Intensive activity on wet soil here has damaged the soil and created a sacrifice area.

Notice the roadside fenceline contrast here, but also understand that most of the scenic landscape in the background is damaged. The gated culvert doubles as a stock underpass.



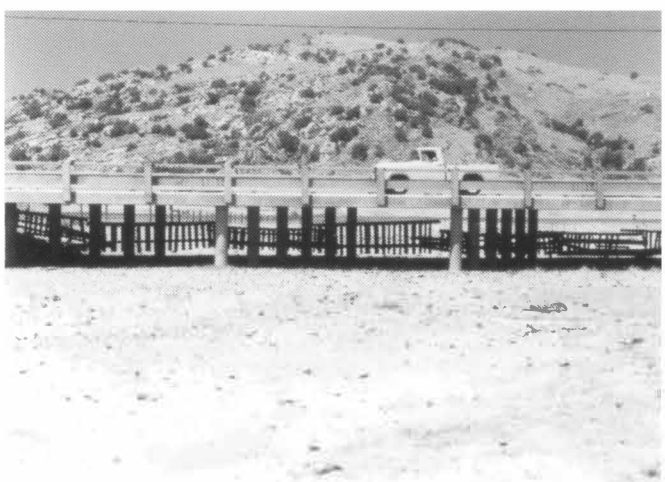
Hundreds of thousands of sacrifice areas are virtual moonscapes. Note that a pipe exclosure protects the storage tank from cattle damage.



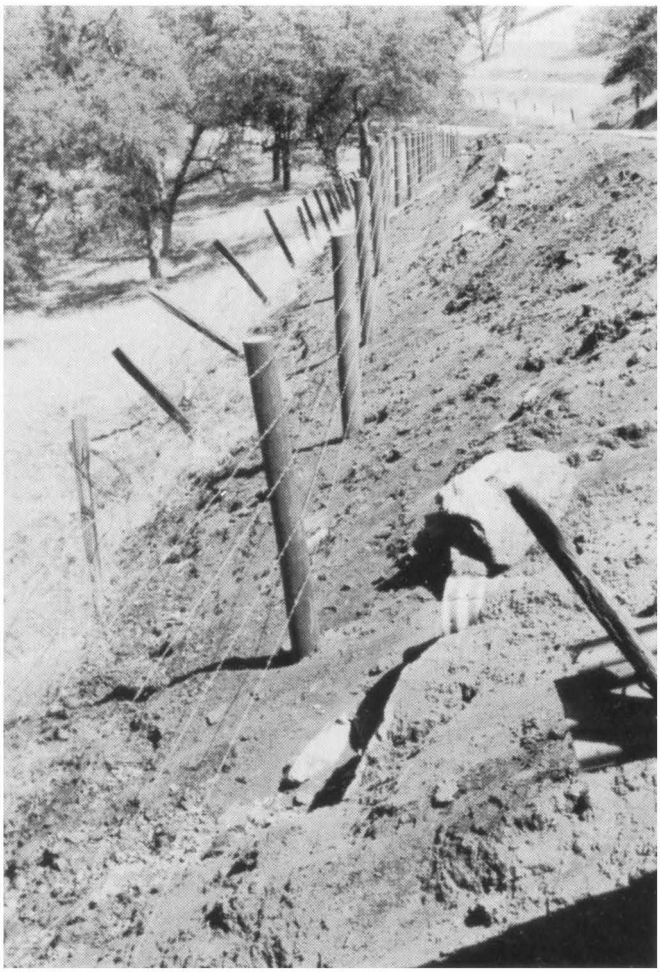
Another cattle tank sacrifice area. A solar heater helps prevent ice capping so cattle may exploit the range in winter. (Some tanks are propane-heated.)

Corrals, pens, chutes, and ramps on BLM land.

A 2-mile-long pipeline feeds this cattle water trough. *(BLM)*

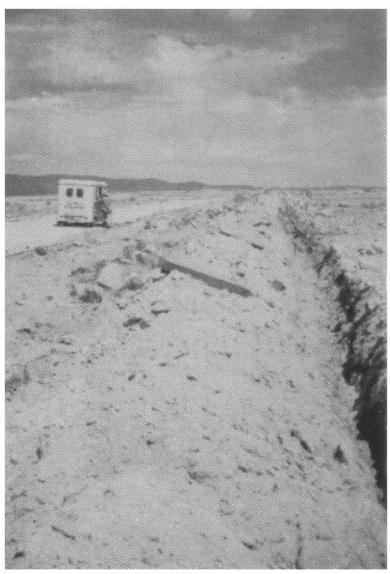


Fencelines cleared through thick brush harm the land both directly and by providing increased access to cattle and humans.

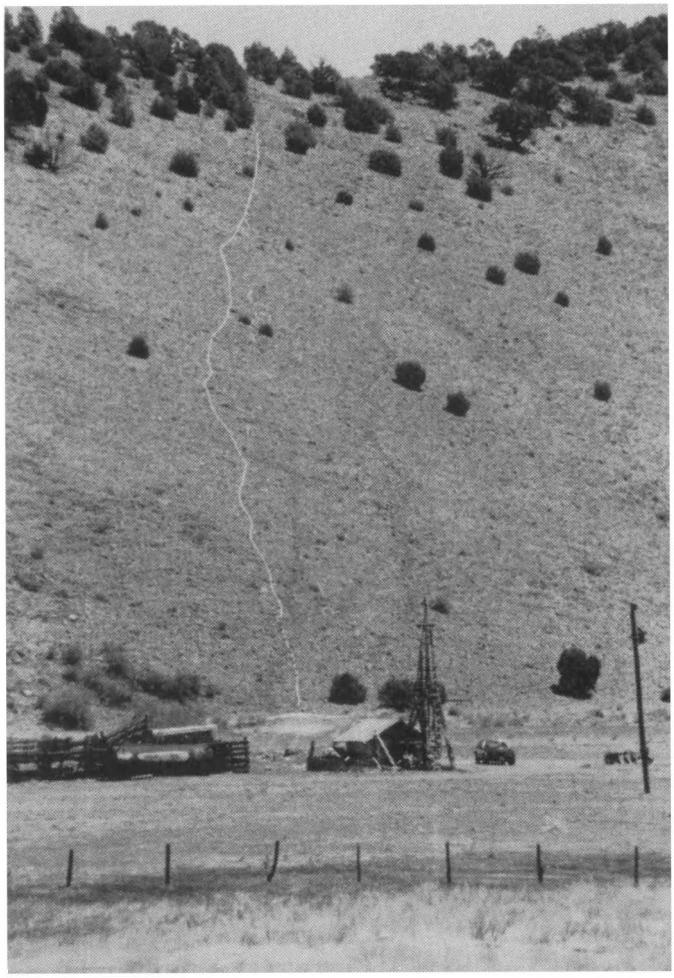


A culvert and the fill of a ranching road on right; new and obsolete fences on left.

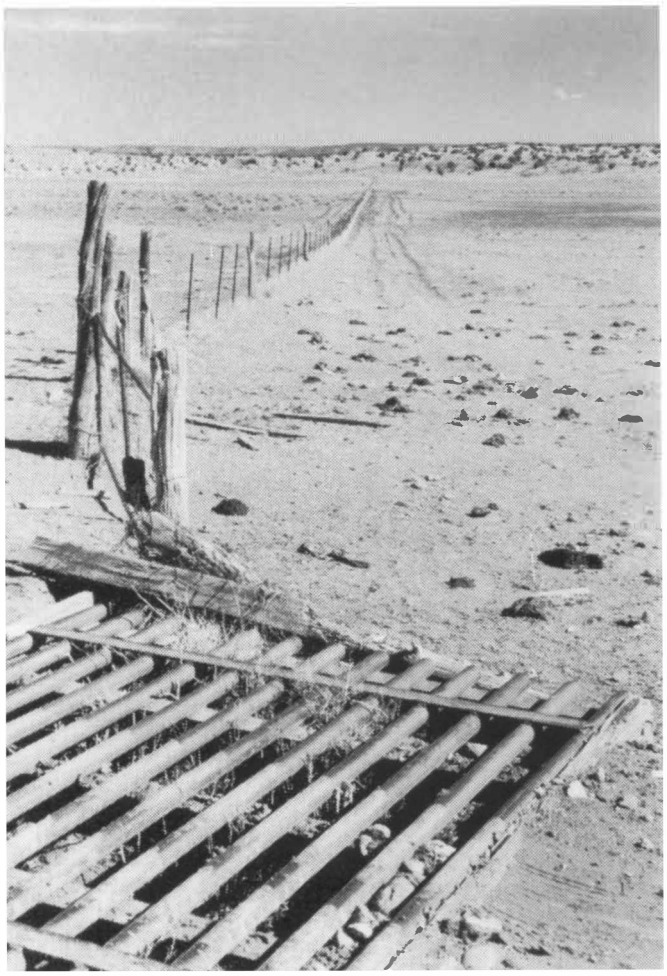
A new cattle tank being constructed in the Coconino National Forest in central Arizona. This tank is sponsored by taxpayers, as are by far most stock tanks on public land.



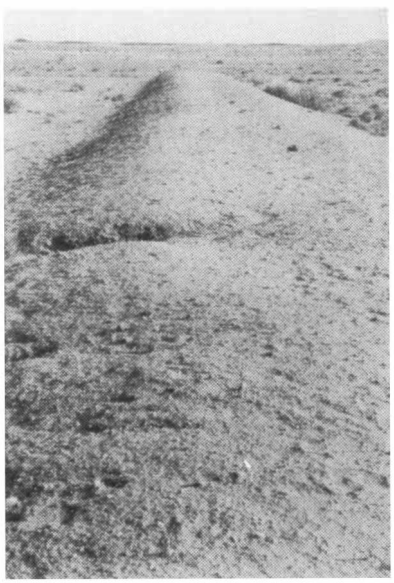
A water pipeline for cattle being installed on BLM land.



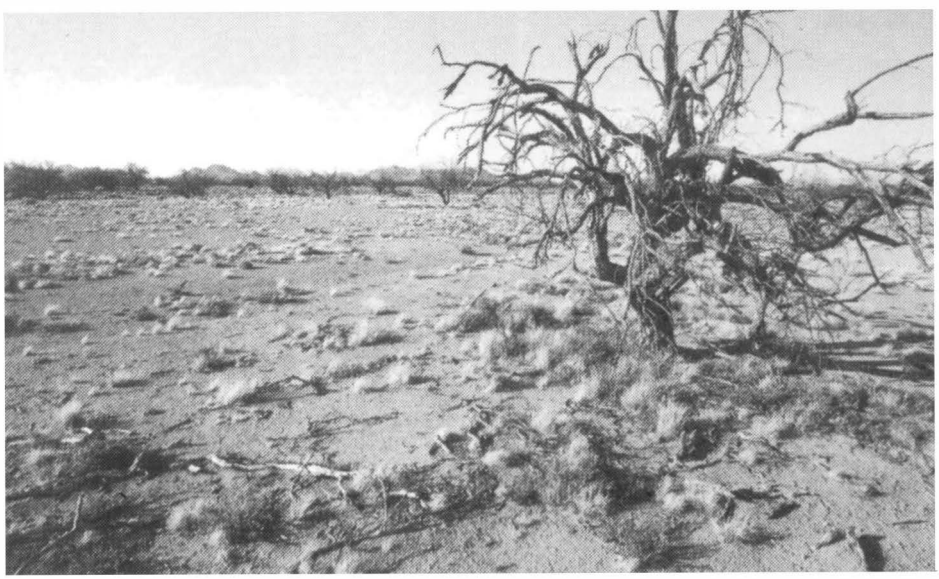
A water pipeline leads over this hill to a stock tank on public land beyond. Note the roadside fenceline contrast in foreground.



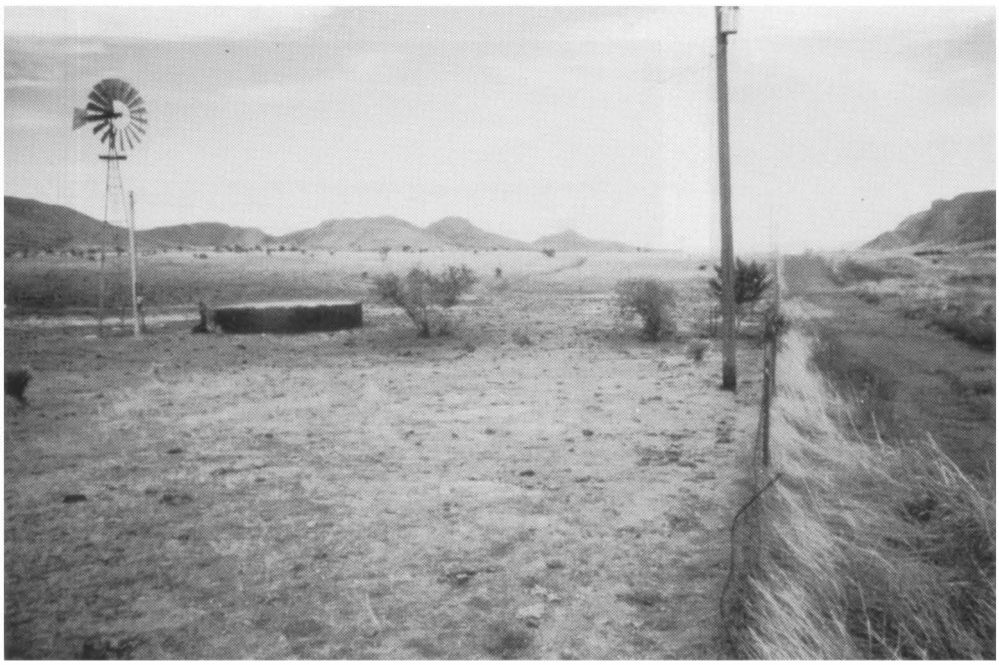
Range developments allow ranchers to more fully exploit public land.



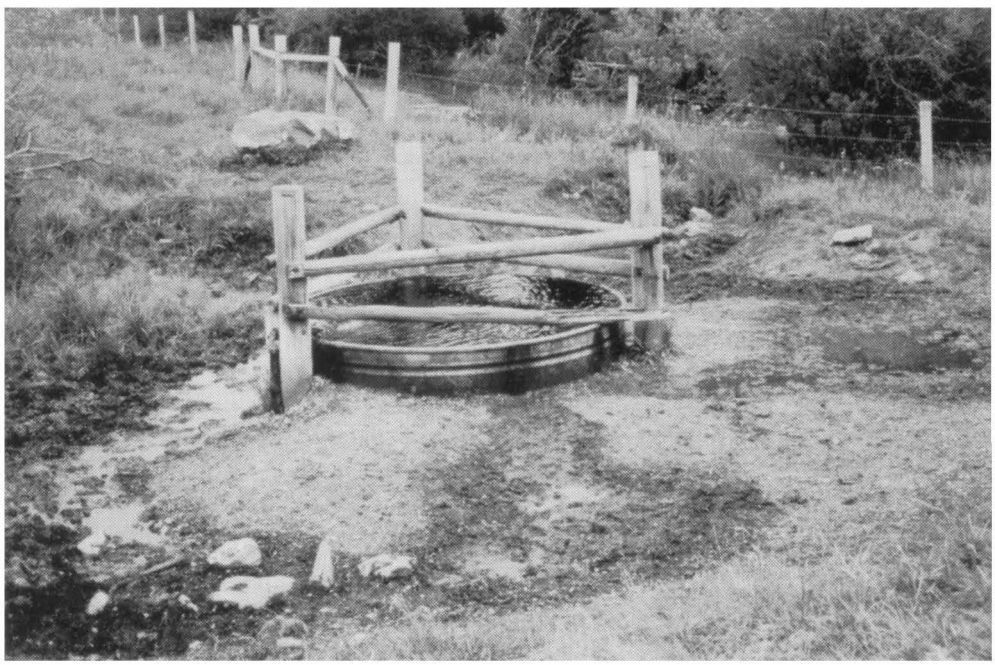
A portion of a soil erosion control project on BLM cattle range in central New Mexico. Such projects are not linked to ranching by BLM.



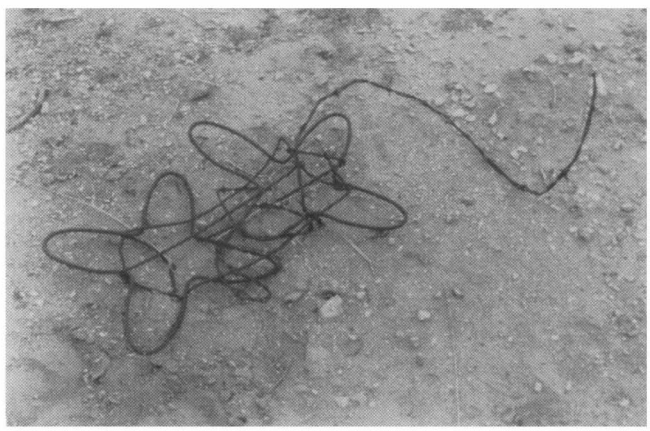
Long after it was herbicided to recreate grassland lost to livestock grazing, this once heavily vegetated portion of Avra Valley, Arizona, remains a wasteland. Tens of millions of acres of Western range have been herbicided to increase or maintain livestock grazing levels. *(Terrance Moore.)*

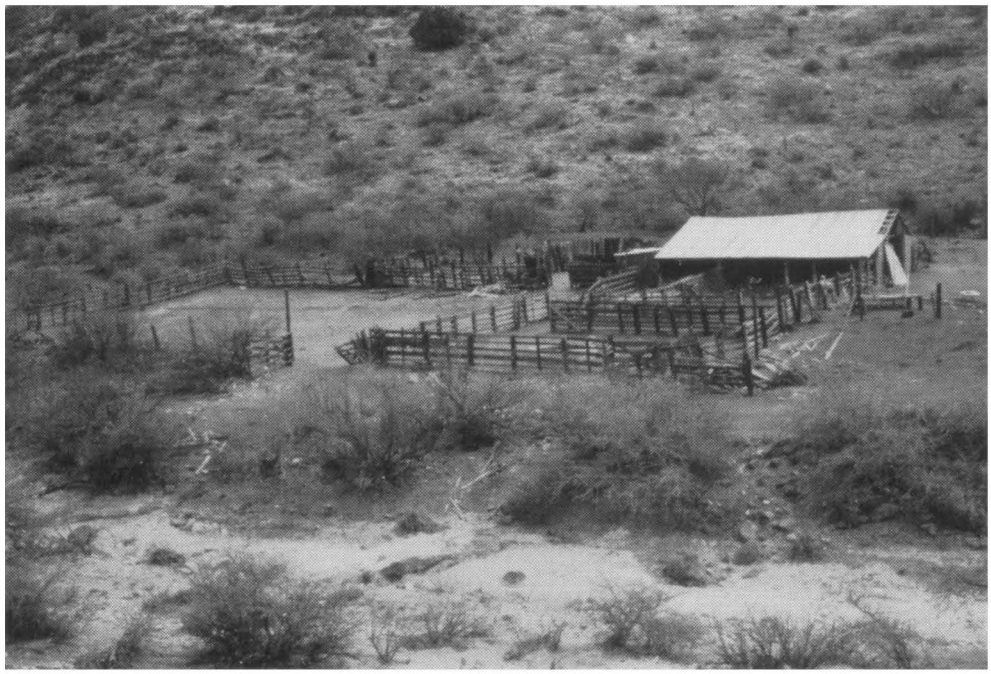


A tank sacrifice area. The windmill is supplemented by an electric pump. Note the roadside fence, fenceline contrast, firebreak, cattle trail, and ravaged range.



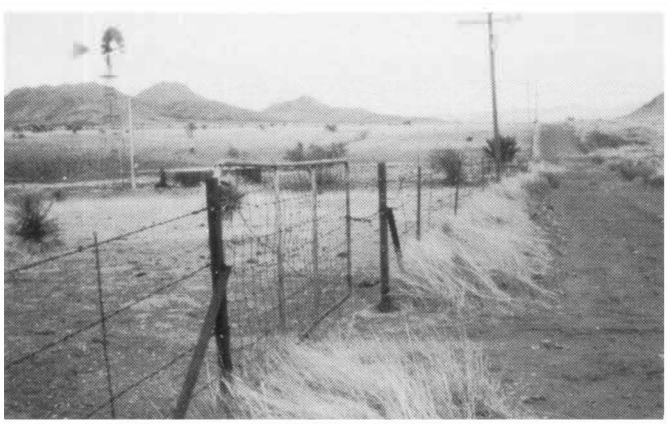
A galvanized iron water tank for cattle in the Black Hills National Forest, western South Dakota.

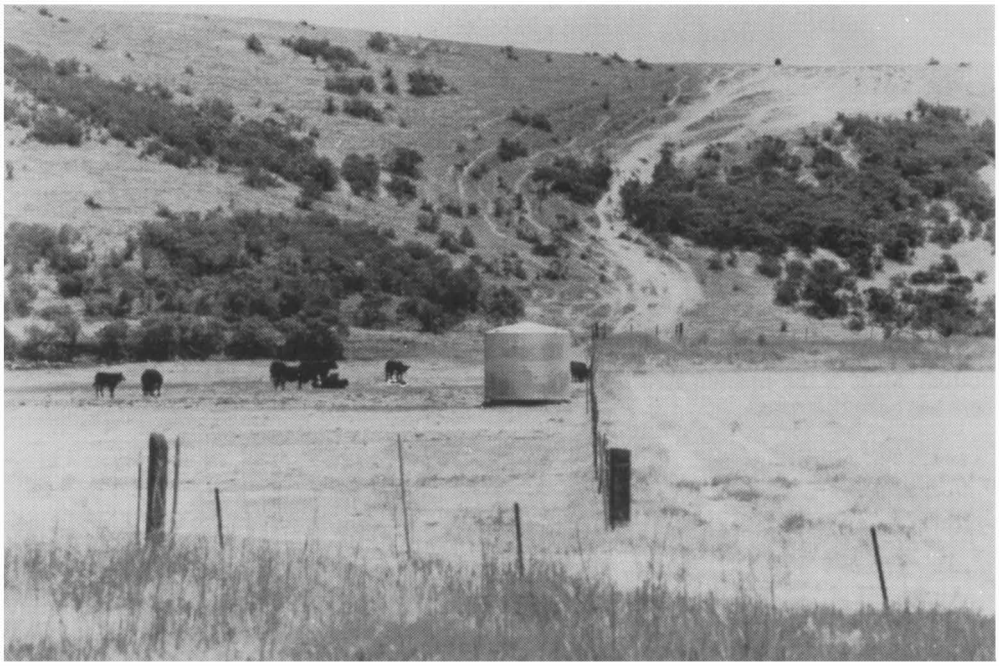




An auxillary public lands ranching operation concentrates livestock and human damage on this canyon bottom. Most of the riparian area here has been destroyed.

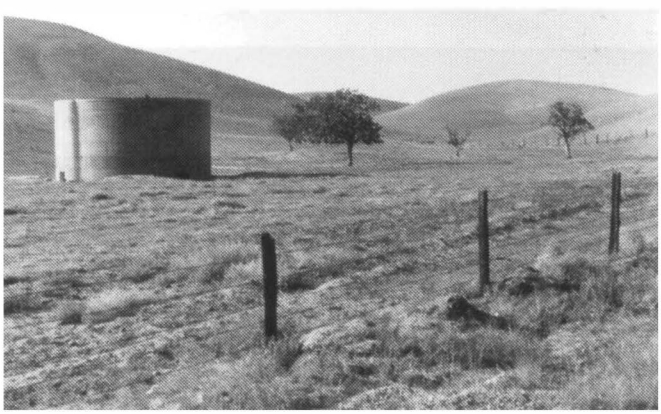
Tens of thousands of miles of destructive firebreaks "protect" ranchland often so denuded by livestock that it cannot carry fire. As always, note the fenceline contrast. California BLM.



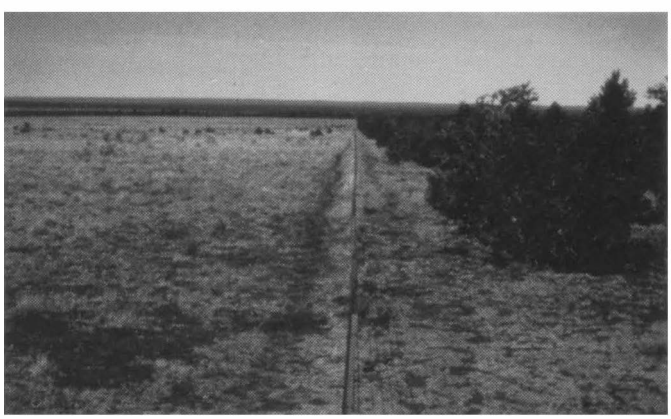


Cattle create numerous parallel trails as they move through a saddle to and from an artificial water source and forage areas. Again, note the roadside fenceline.

Ranching damage surrounds a half-acre exclosure at high elevation in a Utah National Forest.



A stock tank, roadside fence and contrast, and depleted range. Note the lack of lower branches on the trees.



Deforestation for cattle in Kaibab National Forest in northern Arizona. Both sides of the fence are badly overgrazed.