

Cato Institute Policy Analysis No. 234: Beyond the Grazing Fee: An Agenda for Rangeland Reform

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Executive Summary

The results of more than a century of grazing on public land are testimony to the failure of land-use socialism. By all measures, private grazing on federal lands has been a costly venture. The environmental condition of public ranges deteriorated in the early 1900s because of overgrazing, and improvement since then has been slow and expensive. Taxpayers have paid for federally supervised and subsidized grazing. Ranchers, the intended beneficiaries, have gained little except debt, insecurity, and mountains of regulations. Environmental quality has withered on the political vine of congressional appropriations and multiple-use management.

Range reform is the centerpiece of Interior Secretary Bruce Babbitt's environmental agenda, yet his Rangeland Reform '94 is a bitter disappointment. It ignores the institutional impediments that have made overgrazing and land abuse official programs of the federal government, and it leaves unchanged the federal policies that discourage rancher stewardship and pay stockmen to overgraze and reward them for poor management practices. Because Babbitt's reform plan leaves the worst defects of grazing public land intact, the worst outcomes of such grazing will continue.

It is time to rethink our use of public lands. New institutions and policies--predicated on deregulation and the end of command and control--are needed. First, ranchers, not taxpayers, should shoulder the fiscal burden of private grazing on public lands. Second, grazing permits should be made marketable to persons other than ranchers and for uses other than livestock. Third, control over federal lands should be decentralized in selected areas on a trial basis. Fourth, range reform should be taken to its limits, extending local control and opening debate on partial or full divestiture of public lands.

Introduction

Public-land grazing is an American anomaly. In a culture and economy of free enterprise, it is the nation's most conspicuous and extensive flirtation with socialism. Deeply regulated, like other sectors of the economy, it is an industry owned and operated by the U.S. government. The land and grass are federal property, planning and management are federal functions, and the workers--the 27,000 ranchers who own the livestock--are federally licensed, supervised, and subsidized. From the building of fences and watering holes to the setting of details of how, when, and where to graze, grazing on public lands is in every sense a command-and-control economy.

Economically, public-land grazing is insignificant; it accounts for less than 3.5 percent of the nation's beef, and federal rangeland provides less than 2.6 percent of the nation's total feed for cattle, sheep, horses, and goats.[1] Yet public-

land grazing makes up in size for what it lacks in productivity. A third of the nation is federally owned, and, exclusive of Alaska, 90 percent of public lands--364 million acres--lie within the 11 westernmost states and account for almost 50 percent of the western land base. Three-quarters of the federal land in the West are dedicated to public-land grazing. Grazing on those 265 million acres eclipses logging, farming, and mining and serves as the mainstay of the region's rural economy. From Nevada, where 82 percent of the land is federal, to Washington, where less than a third is federal, livestock grazing is big government business--and an expensive business at that.[2]

Public-Land Grazing Issues

Since its inception at the turn of the century, public- land grazing has consumed billions of tax dollars and has had questionable economic, social, and environmental outcomes. Intended to serve the public interest, it has failed to serve even the special interests of livestock producers. Net ranching incomes are at historic lows, and the economic values of grazing permits are far below their peak in the early 1980s.[3] Further, public-land grazing has left deep divisions in American society, rifts exacerbated by mounting deficits in the grazing program, alleged inequities in the allocation of public-land resources, and real and perceived environmental costs arising from use of public lands for livestock. Those issues underscore the flaws and defects of a century of public-land grazing.

Fiscal Soundness

The public-land grazing programs of the Forest Service and the Bureau of Land Management are in the red and have been since the end of World War II. In 1994, for example, the combined line-item appropriations for the agencies' two grazing programs was \$105 million. Fee revenues were \$20 million for the BLM and \$9 million for the Forest Service, yielding a net deficit of \$76 million. That deficit, though, is probably understated. If the range-related proportions of appropriations for things like planning, soils, and wildlife and riparian management are included, the current deficit of the total federal grazing program probably approaches \$200 million per year. In all, billions have been spent on below-cost grazing since 1945--taxpayer outlays that are further swollen by massive rangeland appropriations such as the \$113 million allotted to the Forest Service by the 1949 Anderson-Mansfield Act and the large reclamation projects funded through the BLM at up to \$25 million a shot from the late 1960s to the early 1980s. The BLM and the Forest Service now spend 10 to 20 percent more on their public-land grazing programs each year than publicland ranchers make in net profits. Moreover, six years of the combined rangeland budgets of the two agencies now equal or exceed the current market value of all federal grazing permits: roughly \$1.2 billion.[4]

Natural Resource Equity

Apart from the fiscal shortcomings of socialized grazing, the issue of natural resource equity stands out as a major point of contention between advocates and adversaries of federal ranching. Environmentalists, private-land ranchers, and a growing proportion of the nonranching public believe that public-land grazing is inequitable. Those people see it as a government-mandated land-use monopoly that relies on taxpayer dollars for its existence and is sustained irrespective of economic payoff, ecological effects, and consumer demands--demands that increasingly favor wildlife and recreation over cattle and red meat. They argue that they are shut out from the everyday decisionmaking that controls the management and use of federal lands. They believe it is unfair that a small number of ranchers-- about 1/100th of 1 percent of the U.S. population and 2 percent of the nation's cattle producers--enjoy special privileges on 264 million acres of federal land and that grazing is a political mandate rather than a market outcome.[5] They are, in the words of an environmental leader in New Mexico, "powerless and not heard, [able to] affect what happens on public rangeland only by challenging the agencies based on environmental rules." [6]

Rangeland Health

Questions of rangeland health cast the darkest cloud over the public-land grazing programs of the Forest Service and the BLM. Data collected since 1935 show moderate improvement in the condition of many public lands. However, much of that improvement has been the result of simply ending open range, which prevailed in the West up to 1935. In contrast, on-the-ground federal management, including vast taxpayer-financed range reclamation and restoration projects, has been a minor factor in the overall improvement in the health of public rangeland.[7] Moreover, environmental groups are dissatisfied with the slow improvement in public grazing lands. Studies by the General Accounting Office, for example, indicate that two-thirds of public grazing lands remain in less than good condition and

that the majority of western riparian areas and streams continue to be overgrazed and degraded.[8]

Despite such data, there is no objective way to establish whether rangeland health and the rate of its improvement are satisfactory. What is satisfactory to ranchers or the federal agencies is often unsatisfactory to sports-people, recreationists, and wildlife enthusiasts. Yet the absence of an absolute standard against which to gauge the health of public rangeland does not alter the fact that increasing numbers of Americans are upset with the state of public grazing lands. More and more people think that grazing lands are either not improving quickly enough or that they are failing to meet consumer land-use expectations. Simply put, the dispute over rangeland health is as much a scientific controversy as it is a collision of land-use values made inevitable by the politicization of western natural resources.[9]

Babbitt's Rangeland Reform: An Unworkable Plan

On February 22, 1995, Secretary Babbitt published in the Federal Register final rules for his proposed Rangeland Reform '94--a series of changes to the BLM's grazing program designed to address the issues of fiscal soundness, public participation in grazing management, and rangeland health. Although Republicans in the Senate and House are likely to revise, amend, and delete many of Babbitt's reform rules well in advance of the August 1995 rulemaking deadline, it is instructive to look at his proposals.[10] They will set the tempo and direction of the debate on range reform for both the BLM and the Forest Service in upcoming months.

The Grazing Fee Bugaboo

Babbitt's original Rangeland Reform '94 proposed nearly tripling the base federal grazing fee from \$1.23 per head per month to \$3.96. The grazing fee increase, however, was dropped from the final rulemaking because of political opposition from western congressional delegations and rancher organizations. Nonetheless, Babbitt has stated that higher grazing fees remain a priority and will be pursued in the future to reach a fair market price for public forage, to discourage overgrazing, and to balance the range budgets of the BLM and the Forest Service. Higher grazing fees, though, are unlikely to yield fair market values, stop overgrazing, or end below-cost range use.

Market Values. The GAO concluded in 1991 that the current grazing fee formula significantly understates the market value of grazing on federal lands.[11] In contrast, economists at several western universities argued a year later that the same formula "capture[s] the market value of the [public] forage if the rancher's investment in the grazing permit is recognized." [12] Both arguments are true. The GAO is correct: The current grazing fee is not returning to the U.S. Treasury revenues that are commensurate with market prices paid for the use of private lands. Competitive bidding for public-land forage, for example, routinely sets grazing rates at levels several times the amount of the official fee. Economists are also correct: Below-market grazing fees are capitalized into the value of grazing permits. The real fee paid by ranchers today is the 1995 fee, \$1.61 per head per month, plus the cost of interest on the capital invested in the grazing permit--about \$2.50 per head per month, or \$4.11 total.

Taxpayers capture only part of the value of grazing, the below-market fee of \$1.61 that is far less than real forage value. The higher, residual value is simply traded among ranchers--sold initially as windfall profit and then paid for as a routine cost of ranch operations. In that regard, the GAO is right; taxpayers are being taken for a fiscal ride. But to ranchers the fiscal ride is not a subsidy; it is the price they pay for a privilege when they buy their grazing permits from other ranchers. That is why stockmen are so opposed to Babbitt's higher grazing fee. They see it as a taking of what they paid hard cash for, worked a lifetime for, and set aside for their children's future.[13] That does not help the taxpayer, of course, but it does put the grazing fee and the grazing program in perspective: market value is being paid to someone and, at the same time, the grazing program is running deeply in the red.

Overgrazing. Proponents of Babbitt's grazing fee increase argue that the current below-cost fee encourages overgrazing and that an increase in fees would reduce demand for grazing. Although higher fees at some point would probably reduce demand, there is no evidence that current fees promote the grazing of too many head of cattle (excessive "stocking"). For example, the percentage of grazing lands on which cattle have not been run (known as grazing nonuse) during the past two decades has averaged 22 percent for BLM land and 15 percent for Forest Service land.[14] Those figures clearly do not substantiate claims that prevailing fees invite excess livestock. If that were true, we would expect nonuse levels to be negligible or nonexistent on all public lands.

Below-Cost Range Use. Higher grazing fees are advanced in part on fiscal grounds. However, it is unlikely that new fees in the context of Babbitt's proposed range reform can or will resolve the fiscal crisis of public-land grazing. First, if Babbitt had been successful in raising fees incrementally as proposed, the additional net revenue to the U.S. Treasury in 1995 would be less than \$8 million--not enough to cover even the \$14 million he requested in 1995 to jump-start his grazing reform program. Even after the fee increase topped out in 1997, and lower "incentive fees" took force, net revenue would be barely double what it was in prereform 1994, leaving the grazing program still far in the red. Second, the long-term implementation of Babbitt's plan will require even greater increases in appropriations, forcing the BLM's grazing program into deeper deficits. Third, Babbitt's Rangeland Reform '94 prohibits ranchers in the future from owning range improvements and holding water rights on federal lands. The net effect will be to reduce private investment and increase taxpayer spending on public lands, making below-cost grazing all the more entrenched and expensive on the federal range.

Ten million dollars was spent by the federal government between 1985 and 1994 to study fair-market-value grazing fees. It is apparent, though, that whatever fee is arrived at for public lands--whether it is the current fee or Babbitt's proposed fee--will be the outcome of political rather than market forces. As the GAO correctly notes, "Because a competitive market does not exist, federal grazing fees must be artificially set in the context of often-conflicting policy objectives." [15] That fact explains why the grazing fee issue has dominated public-land policy debate since 1905 and why it has put Babbitt's grazing reform on political skids. Making ranchers pay higher fees does not emulate market processes, does not promote healthier ranges, and does not bring fiscal integrity to a deficit-ridden program. Babbitt's plan is proof. At best it is a platform for special interest groups to use to wage war over a symbolic issue, and at worst it is a smoke screen that impedes real progress toward real reform.

False Empowerment

As a major reform step to decentralize decisionmaking and to expand the voice of nonranchers in public-land management, Secretary Babbitt plans to create citizen-based resource advisory councils at the BLM grazing district level. Comprising a cross section of land users, the councils would "allow more Americans to have a say in the management of their public lands," and they would be "an important element of improving the management of the public rangelands." [16] Good intentions aside, the councils would be largely cosmetic. They would lack 1) the power to change how decisions about public lands are made, 2) the breadth of membership needed to truly open decisionmaking about federal lands to broad public participation, and 3) the lines of accountability and responsibility that are essential to good land stewardship and protection.

* Babbitt's councils would be strictly advisory. They would have no power to engage in management decision-making at the local level where their knowledge, skills, and personal commitment might be most useful. Indeed, even their advisory role would be constrained to consensus decisions. A diversity of ideas, so essential in modern society, would be a liability to Babbitt's grazing land reform.

* Babbitt's councils, constrained by mountains of rules, regulations, and laws, would be little more than rubber stamps for federal decisionmaking. At best they would have a perfunctory role; at worst they would lend legitimacy and credibility to a failed system of public-land grazing. In either case, Babbitt's councils would not bring real decisionmaking power closer to local people and local communities. Federal employees, not land users, would remain in charge of the federal range.

* Babbitt's councils would not broaden public participation in any meaningful sense. Except for the 10 to 15 members of each of the several resource advisory councils established in the West, most Americans would remain disenfranchised on federal rangelands. Non-rancher users of public lands would have the traditional tools of lobbying and litigation, but they would have no new tools for making their voices heard and felt.

* Babbitt's councils would be nothing more than rehashed, 1980s-style multiple-use advisory boards. Their function would be to breathe new life into a political system of multiple-use management that has failed so far to either protect the nation's resources or allocate them in a manner that is efficient and fair.

* Babbitt's councils would be trained in range practices. Scientific knowledge is good, but a century of mismanagement by highly trained Forest Service and BLM personnel suggests that training is not the answer. Public

lands are not models of healthy, robust ecosystems. If anything, technical training has obscured the political origins of land degradation--the institutional and policy roots of land abuse that are not part of the range education of either Babbitt's councils or today's public-land managers.

* Babbitt's councils would lack accountability. There would be no way to hold them responsible for bad advice, to make them answerable for recommendations that resulted in resource loss or land degradation. Ranchers, of course, might face revocation of their grazing permits, but for other members the worst that could happen would be to miss a second council term. Not accountable, they would have no cause to resist policies and institutions that foster mismanagement and overgrazing on public rangelands.

* Babbitt's councils would shield the BLM from accountability for land management. In the guise of public participation and multiple-use management, they would give the agency rationales for pursuing and sustaining management practices that are neither economically sound nor ecologically viable.

Commanding and Controlling Nature

Babbitt's grazing reform package proposes to improve rangeland health through a series of standards and guidelines aimed at making ecosystem management reality on BLM grazing lands. Although ecosystem management is sound in principle, its application at the macrolevel of public lands and the microlevel of grazing allotments is ambitious and potentially costly. Moreover, the assumptions of ecosystem management, to the extent they presume human ability to plan and control nature, are neither realistic nor attainable. There is no evidence that centralized management of nature's economy has been or will be any more successful than the centralized management of human economies. Ecological features such as watershed functions, water quality, distribution of nutrients, energy flow, animal populations, and native plant habitats--the very features Babbitt proposes to regulate--are no more amenable to human mastery than are markets and market processes.

More to the point, Babbitt's standards and guidelines are not breaks with past land management practices and traditions. They are merely extensions and expansions of rules and regulations already mandated by the Federal Land Policy and Management Act of 1976. At best they clarify the concepts of multiple use and sustained yield management, the building blocks of public grazing management since 1960. Those concepts, however, have not perceptibly improved rangeland health over the past quarter century. Merely polishing and lengthening the list of ecological rules and regulations that guide and constrain public-land use is unlikely to bring profound change to a public-land grazing system that has not worked since its inception. No matter how efficacious ecosystem management may be, Babbitt's Rangeland Reform '94 does nothing to change the institutions and policies that are the root causes of the degradation of federal lands. Yet, so long as those institutions and policies remain unchallenged and intact, meaningful reform of public-land grazing is unlikely, if not impossible.

Roots of Degradation of Public Grazing Land

Public grazing lands have a long history of abuse and overgrazing. From the end of the Civil War until the 1934 Taylor Grazing Act, open range prevailed on federal lands. Stockmen built fences, controlled water for livestock, and formed policing associations to protect the unowned grass resource from overuse. Homestead laws and federal enforcement of open range, however, frustrated stockmen's efforts and made the resulting "tragedy of the western commons" the official land-use policy of the U.S. government.[17] By 1936, 90 percent of western public lands were estimated to be severely depleted.[18]

Rather than change the policies that promoted overgrazing, Congress established the Forest Service and the BLM to regulate use of public land. Later, Congress rounded out its response with a quarter century of environmental statutes, beginning with the Multiple Use, Sustained Yield Act of 1960. Federal efforts to protect public rangelands succeeded to the extent that they contained the "tragedy of the western commons." They failed, however, to fully curb the deterioration of rangeland soils, plants, wildlife, and wetlands. Ironically, the institutions created by federal efforts and the policies they spawned to stop resource depletion simply perpetuated and deepened the environmental crisis of public grazing lands.

Institutionalized Land Degradation

Public-land grazing permits are the legal devices that join public and private lands into ranching units called grazing allotments. They are the tools that effectively enclosed the open range, granted security of tenure to ranchers, and gave federal land agencies authority to mitigate resource depletion. They forged a semblance of order out of the chaos of the open range, but they also institutionalized overgrazing on public rangelands.

Formalized Overstocking. The original grazing permits issued by the Forest Service and the BLM authorized numbers of livestock that exceeded the sustainable carrying capacity of western rangelands. Despite a half century of corrective measures, federal grazing privileges still exceed what the land can bear. Grazing nonuse mitigates, in part, the historic overobligation of federal grazing privileges. However, even with grazing nonuse running as high as 15 to 22 percent, overall stocking on federal lands is still 10 to 25 percent above the land's long-term ability to sustain soil health, grass production, and wildlife populations.[19]

Perverse Incentives. Grazing permits provide strong incentives to ranchers to resist ecologically justified stocking reductions. That is because grazing permits, or more accurately the numbers of livestock (preferences) they authorize, are the only assets that ranchers can hold in public lands. Because grazing permits are marketable to other ranchers, because low grazing fees are capitalized into their value, and because they enhance the worth of associated, privately owned lands, ranchers see and treat them as private property. As a result, the incentive of public-land ranchers is to steward and conserve the one thing they own--not the land, but the grazing preferences that go with their permits. Since stewarding and conserving authorized numbers is best done by lobbying, the political carrying capacity of public lands almost always takes precedence over their biological carrying capacity.

Overdeveloped Ranges. Forest Service and BLM staff have used historic overstocking and ranchers' permit interests as rationales for overdeveloping public grazing lands. They have made grazing privileges contingent on higher levels of private and public investment in range improvements. Although overcapitalization has benefited agency budgets, it has not proven beneficial to ranchers and rangelands.[20] It has made stockmen trade Model-T grazing for Cadillac grazing and incur debts that diminish, rather than enhance, profits. Through subsidies it has fostered stocking rates and management practices that are detrimental to soils, plants, and wildlife. It has expanded and intensified physical effects on wild lands. It has eliminated the forage reserves that are needed to withstand periodic drought. And it has set environmentalists against ranchers.[21]

Institutionalized Market Failure. The grazing permit system institutionalizes and narrows the land-use choices available to public-land ranchers. Riparian areas have marketable value for recreation and fisheries, and upland ranges have marketable value for big game habitat. Grazing permits, however, constrain the marketable uses of riparian areas and uplands to water and forage for domestic stock. Indeed, public-land laws and regulations compel stockmen to see and treat recreation, fishing, and hunting as activities that compete with their ranching operations. Market failure is the outcome. The incentives endemic to the grazing permit system encourage ranchers to use water and grass for only those activities that have government-sanctioned, paying benefits--activities that historically have contributed most to federal land degradation.[22]

Institutional factors other than the flawed permit system also contribute to the environmental shortcomings of public-land grazing. They add to the barriers to stewardship and the structural disincentives that have fostered overgrazing, resource depletion, and land degradation for so long over such a large geographical area.

Small Grazing Allotments. Federal policy for the past century has encouraged, in the name of social equity, the proliferation of small public-land grazing allotments. On BLM lands, more than two-thirds of all grazing permits are for herds smaller than 80 head.[23] Small allotments, however, are not economically viable, at least not without federal subsidies. Data from New Mexico State University show that ranches that have fewer than 200 head are not profitable.[24] Moreover, stockmen with small allotments cannot afford conservative grazing practices. The marginal nature of their operations demands that every unit of authorized forage be consumed every year. They cannot afford grass reserves for future drought, investments for land improvements, or reductions in stocking for ecological reasons. That is why small allotments are often in the poorest condition--an environmental outcome of federal policies that set the economic needs of ranchers on a collision course with the ecological needs of the land.

Community Allotments. Permits are often allocated to two or more ranchers to form community grazing allotments.

Created as remnants of the open range or as solutions to the economic inefficiencies of small allotments, they are common-use lands regulated in theory by agency oversight and agency-sponsored grazing associations. In practice, however, federal supervision does not shield community allotments from the tragedy of the commons. Areas of good grass, for example, are overgrazed out of fear that what is not used by one person will be exploited by another. Members are reluctant to invest in management, fearful that others will take a "free ride" on their stewardship. Stockmen who would like to graze conservatively do not, knowing that the grass they do not use will simply be consumed by the livestock of less caring members. The result is overgrazing, resource depletion, and continued land degradation.

Forage Nonuse Policy. Forest Service and BLM grazing permits require ranchers to make substantial use of forage, especially on ranges in good and excellent condition, or face loss of grazing privileges. Penalties for nonuse force levels of grazing beyond what market conditions would justify and what some conservation-minded public-land ranchers would like.[25] Babbitt's reform plan would liberalize nonuse regulations but not alter their disincentives. As before, nonuse rules would sustain the monopoly hold of livestock grazing on federal lands. Ranchers whose ranges are in good or excellent health would still face the choice of either grazing stock at levels dictated by the BLM or losing their grazing permits. They might want to use their prime ranges for wildlife or recreation, but under Babbitt's plan no cattle or sheep would mean no permit after three years. The best of ranchers, the men and women who envision rangelands as more than food and water for livestock, would be constrained as before to an economic activity that has historically returned less than 2.5 percent on investment and that no longer reflects the land-use preferences of increasing numbers of Americans.[26]

Tenure and Ownership. Federal commitment to limited grazing tenure (10-year maximum permits) and current (Forest Service) and proposed (BLM) prohibitions on private ownership of range improvements and water rights on public lands sever the self-interests of stockmen from the ecological interests of the land. They undermine rangeland health by shortening the management horizon of ranchers and by shifting responsibility for rangeland care from land users to taxpayers.

Multiple Use. Multiple-use mandates have erected institutional barriers to sounder stewardship. In theory, multiple-use plans allocate resources to their highest and best use. Recreation and wildlife are increasingly viewed by society as the highest and best use. However, multiple-use plans are not market driven. Because they mandate livestock grazing irrespective of market cues, and because conditions tied to the grazing permit system prevent ranchers from economically benefiting from highest and best uses, resource allocations turn on political rather than economic or ecological considerations. Multiple-use mandates insulate public-land ranchers from the true costs of grazing-- the opportunity costs generated by forgone recreation and wildlife. In effect, they shield stockmen from competing land uses; they accommodate grazing levels that public opinion and market forces would not otherwise tolerate.[27]

Subsidies: Cowboy Socialism

Subsidies to ranchers are the major cause of degradation of both the public and the private components of federal grazing allotments. For example, subsidies to livestock producers help keep the most marginal--and often most environmentally fragile--lands in production by raising incomes and lowering costs sufficiently to justify levels of grazing that would not otherwise be cost-effective or ecologically sound. On less marginal lands, they also promote stocking rates that are neither economically nor ecologically sustainable, at least not without federal support. In addition, they discourage rancher investment and innovation in appropriate land-use technologies by undermining the workings of economic incentives. By the same logic, they make ecologically inappropriate technologies economically sound. They transform bad management into profitable management by distorting cost/benefit ratios. At the very least, subsidies reward ranchers for bad management; at the very worst, they put stockmen who manage well at a competitive disadvantage.

Intensive Technology Subsidies: Range Reclamation. After World War II Congress appropriated funds to the Forest Service and the BLM for massive range investments. The BLM's 1963-85 Vale Rangeland Rehabilitation program in southeastern Oregon is a good example.[28] Decades of over-grazing due to overobligation of grazing privileges, rancher protection of grazing preference, and a prevalence of small and community allotments resulted in severe land degradation. Rather than reduce stocking or amend bad policies, the BLM, ranchers, and local politicians lobbied

Congress for a hefty range improvement subsidy. In 1992 dollars, Congress handed out \$56 million to fix an ailing grazing system and to shore up the grazing privileges of 184 ranchers--an outlay of more than \$300,000 per rancher. Cost per treated acre was \$75, nearly double the market value of an acre of equivalent rangeland, 3.5 times the per acre value of a BLM grazing permit, and more than 160 times the per acre value of annual grazing fees. Not surprisingly, promised range benefits have not lasted. Grass production in heavily treated areas has returned to pre-1963 levels, riparian areas remain in poor condition, and wildlife on balance is no better off than it was at the start. Simply put, land degradation never stopped; it was just given a 20- year, taxpayer-paid reprieve--a reprieve during which bad grazing practices and flawed policies and institutions were rewarded and resuscitated. Nothing changed, nothing was learned. Today, marginal lands are becoming more marginal as overgrazing inches forward. Complacency born of a lavish federal subsidy is discouraging individual innovation and problem solving, and sustainable ranching in southeastern Oregon is fading as a likely scenario. The story is the same all over the West.

Intensive Technology Subsidies: Herbicidal and Mechanical Brush Control. Unlike the massive range reclamation programs of the past, herbicidal and mechanical brush control programs are continuing options on both the private and public acres of federal grazing allotments. Typically, brush control is practiced on overstocked ranges where overgrazing has removed grass as a fuel for fire and as a competitor for growing space. The costs of brush control on public portions of grazing allotments are paid by the land management agencies or shared with ranchers. On private portions, the Natural Resources Conservation Service (formerly the Soil Conservation Service) pays as much as 65 percent of the tab. Significantly, dollar returns from brush control rarely cover the costs--costs that include soil erosion and loss of wildlife.[29] But federal subsidies make brush control profitable. They discourage ranchers from seeking more environmentally friendly solutions to brush problems; they reward bad management and give poor managers a competitive edge over those whose practices are better; they encourage overgrazing by masking the full costs of resource depletion; they sustain livestock operations at levels that are otherwise unsustainable; and they make land degradation a bearable cost of public-land ranching.

Emergency Feed Subsidies. In theory the U.S. Department of Agriculture's Farm Service Agency is mandated to give emergency livestock feed relief to ranchers only in periods of extreme drought. In practice it hands out \$100 million to \$500 million a year during both dry and wet years.[30] Rainfall in New Mexico, for example, has been above average for five of the past six years, yet so has federal relief--relief that has, since 1988, amounted to \$44 million annually in the West. Each participating rancher has received an average of \$4,000 in New Mexico, \$11,000 in Oregon, and \$18,000 in Nevada.[31] Notably, ranchers in the BLM's Vale program received \$30,000 to \$50,000 apiece in feed relief in 1994, sums 5 to 10 times greater than what the ranchers paid in federal grazing fees. The payments allowed them to sustain stocking at an estimated 150 percent above the land's long-term capacity to grow grass, a practice common even on the hot desert ranges of New Mexico.[32] In effect, emergency feed relief creates artificial drought by subsidizing overgrazing. It allows ranchers to run a grass deficit. Each year that they overstock and over-graze--irrespective of rainfall--their rangelands produce less grass, and with less grass their need for drought relief mounts. But so long as government payments grow as fast as the grass disappears, ranchers can stay in business, and even make a profit. The net effect is to make land degradation a keystone of federal land policy.

Animal and Insect Damage Control. Subsidies that compensate ranchers for animal and insect damage to livestock and range forage are minor federal programs. Nonetheless, they do shift the costs of ranching from stockmen to taxpayers, altering the calculus of costs and benefits to the distinct advantage of grazing and graziers on the public lands of the West. For example, the USDA's animal damage control program spends \$30 million annually in the West killing animals such as coyotes that prey on livestock.[33] Although ranchers suffer real losses, the costs of the program far outweigh the benefits. Moreover, many taxpayers resist the idea of shouldering an expense that is part of the cost of ranch operations. Much the same can be said of the USDA's Animal and Plant Health Inspection Service's range grasshopper control program, which periodically costs taxpayers tens of millions of dollars. During severe outbreaks, grasshoppers and crickets consume livestock feed. But government control programs on public lands typically cost more than the value of lost forage and anywhere from 4 to 50 times the amount of federal grazing fees per acre.[34] In addition, the programs burden taxpayers with costs that include the loss of wildlife.

Range Betterment Funds. By federal law, 50 percent of fees collected for grazing on Forest Service and BLM lands are returned to regional, state, and local grazing offices for rangeland improvements. In 1994, \$29 million was collected in fees and \$14.5 million returned to grazing management. Although the sum is relatively minor, it does play a role in the

economic decisionmaking of ranchers. Combined with other federal payments, it contributes to making higher stocking rates economical. That is notable when public-land ranchers earn only \$3 in profits for every \$4 spent by the BLM on range management.[35] By assuming a major share of grazing costs, federal agencies favor marginal operations that are not economically viable and that, in many cases, are ecologically unsustainable. Together, range betterment and associated subsidies pay ranchers several times their payments in grazing fees and make land degradation a probable outcome of public-land grazing.

Experimental Stewardship Programs. The federal government launched programs of experimental stewardship in 1978 to foster better grazing practices on public lands. For example, in Modoc-Washoe, California; Challis, Idaho; and East Pioneer, Montana, \$3 million was spent over 10 years on range improvements for a total of 85 ranchers--or \$35,000 per person. The GAO, after reviewing the programs in 1988, reported that the stewardship subsidies had diminished ranchers' investments and had not appreciably improved range conditions.[36] Like other subsidy programs, the stewardship programs appear to have shifted responsibility for resource use from ranchers and dispersed the costs of resource depletion among the larger population of taxpayers. The effective result has been to reward stockmen for poor practices, and to do so without changing the institutions and policies that led to land degradation in the first instance.

Market Intrusions and Land Degradation

Market intrusions encompass an array of subsidy-free public policies that distort land-use outcomes through intervention in and distortion of market processes. Such policies are endemic to agricultural programs in the United States, and although less prominent in the western livestock industry, they are significant. In general, their environmental impacts are similar: they promote and sustain degradation of public and private land in the West. Some examples follow.

Selected Conservation and Natural Resource Laws. Many laws governing land and resource use have unanticipated consequences, particularly for the privately owned portions of public-land grazing allotments. In 1985, for example, the Farm Security Act added new "sod-buster" provisions to reduce cultivation of highly erodible lands. Close to the same time, farmers in east-central New Mexico, seeking new irrigation sources, challenged the water rights of local stockmen. The New Mexico state engineer ruled that livestock use was not a beneficial use of water in the area in question and that ranchers' water rights would be vacated within five years if they were not put to some other approved use. Adding complexity to the situation, the Farm Security Act created special quotas for Valencia peanuts, a farm crop grown principally in eastern New Mexico. As a result of those events, ranchers put their private ranges to beneficial use by selling them to peanut growers who, in response to lucrative peanut quotas, plowed up highly erodible lands. A federal law aimed at stopping sod breaking and a state water law postulated on beneficial use advanced land degradation on the high plains of New Mexico.[37]

County Property Taxes. The privately owned portions of public-land grazing allotments enjoy low property taxes in comparison to per acre assessments of nonagricultural lands. Although the property tax break is capitalized into a ranch's market value, it can and does influence land-use outcomes in an environmentally adverse fashion. The reason is straightforward. Ranchers who wish to take grazing lands out of livestock production face increases as high as 1,000 percent in per acre assessments. That is not a hardship for landowners who dispose of their property for commercial development. It is, however, a hardship and a disincentive for ranchers who wish to maintain open rural space for nonagricultural purposes.

For example, in southwestern New Mexico an association of ranchers has agreed to set aside the private portions of its public-land grazing allotments as "grass banks." The banks are designed to provide supplementary forage during periods of drought or in conjunction with range improvement practices on adjacent federal lands. Because grass bank lands will not be used regularly for agricultural production, they will be taxed at a higher rate--which discourages some ranchers from participating in the innovative land conservation plan.[38] The same disincentive applies to landowners who want to set aside grazing lands for nature preserves but who lack the requisite nonprofit status to shield themselves from the resulting economic liability of higher local taxes.[39] Designed to promote a healthy agricultural sector, property tax inequities block market-driven environmental options that might arrest land degradation, create new land uses, and put rangelands on the road to ecological recovery.

Free Public Access to Public Lands. Livestock grazing is not always the best and highest use of the privately owned portions of public grazing allotments. Yet free public access to federal lands puts private lands at a competitive disadvantage when it comes to the economics of alternative land uses such as camping, back-country hiking, and wildlife viewing and photography. Because those activities have no direct cost to users of public lands, ranchers who wish to develop them on their private lands and to sell them to the public face a monumental marketing problem: they cannot sell goods and services that a neighbor, in this case the federal government, is giving away free. Federal underpricing of resources skews decisionmaking about private lands and helps perpetuate land uses that are neither economically optimal nor always ecologically appropriate. It forces stockmen to cling to traditional activities and to pursue them at levels--often under the influence of subsidies and market intrusions--that historically have led to land degradation.

Institutions of Land Degradation

A broad array of management and educational institutions has evolved over the past 100 years in response to land degradation in the West. Although those institutions have contributed in some degree to the reversal of resource depletion on public grazing lands, they have not been consistently beneficial. They have inadvertently encouraged, promoted, and helped to perpetuate land-use practices that are incompatible with sustainable grazing on western public rangelands.

Federal Land Management Agencies. Federal land management agencies have supported and implemented the massive subsidy programs that have distorted land-use outcomes on the western public lands. On balance, subsidies have not benefited land conditions, but they have expanded the operating budgets of both the Forest Service and the BLM.[40] The BLM, for example, used the apparent success of its early Allotment Management Plans to justify an expanded range budget even though the Interior Department's Office of Policy Analysis attributed the success to the fact that the plans "were implemented on the better rangelands grazed by more energetic and progressive ranchers." [41] In addition, both agencies have raised the specter of forage shortages to justify expanded appropriations for range programs--programs that have exacerbated rather than resolved the problem of diminishing grazing resources.[42]

Technical Support Organizations. Federal agencies such as the Natural Resources Conservation Service and the Farm Service Agency (formerly the Agricultural Stabilization and Conservation Service) act as conduits for subsidies that have promoted overstocking and sustained through federal relief environmentally damaging land practices. In addition, those agencies and the USDA's Cooperative Extension Service have provided public-land ranchers with free or below-cost information. Although good information is vital to conservation, its gratuitous provision distorts land-use outcomes. Information is a normal cost of doing business, a cost that businesses must consider when deciding what and how much to produce. Subsidized information for ranchers-- even if provided for the best of environmental reasons-- tends to shift the cost/revenue balance in favor of less conservative rangeland stocking. Last, subsidized information discourages private-sector innovation and provision of information. Fewer sources of information, in turn, diminish the overall menu of ideas available to stockmen for coping with and mitigating historic trends of degradation of public land in the West.

Academic Institutions. Natural resource schools in western universities share responsibility for perpetuating the policies of land degradation in the public-land West. Their curriculums, geared toward intensive technologies that expand grazing use, presume that the highest and best use of western rangelands is for food production and that public- land forage is vital to supplying red meat. Market forces, however, suggest that the highest and best use of public lands is not producing red meat and that red meat is abundant and priced low and will remain so irrespective of federal range contributions. Moreover, market forces--if left unfettered--would probably retire marginal and environmentally sensitive grazing lands, would encourage technologies favoring sustainable grazing, and would give ranchers incentives to develop economically and ecologically sound alternative land uses. But academic institutions have not heeded markets. They have not considered the institutional and policy roots of land degradation. They have not examined the ecological implications of the grazing permit system, the institutional flaws that promote poor stewardship, the subsidies that reward bad management, and the market intrusions that lead to undesirable land-use outcomes. Instead, they have facilitated degradation of public lands by upholding flawed institutions, unworkable public policies, and badly motivated ranchers.

Academic research has frequently fostered unsustainable ranching in the West. A prime example is a federally funded New Mexico State University project to modify rumen microorganisms so as to allow cattle to eat otherwise poisonous locoweed.[43] Problems with locoweed are usually limited to rangelands that are either overstocked or depleted by over-grazing.[44] By spending federal dollars to enable cattle to eat locoweed, researchers are encouraging grazing practices that are destructive to range plants. Stockmen may now find it profitable to overgraze and deplete their rangelands because they can use plants that were once useless and dangerous to their livestock. As a result, the penalty for bad management will no longer be lost profits due to degraded ranges but profitable grazing opportunities made possible by inappropriate, federally subsidized technologies.

Putting Range Reform Back on Track

Range reform on BLM and Forest Service lands is needed to correct a century of economic inefficiency and environmental abuse. First, the deficit-ridden federal grazing program must be made fiscally sound to relieve taxpayers of an unnecessary burden. That means streamlining the operations of the BLM and the Forest Service. Second, economically and ecologically failed multiple-use policies must be replaced with market policies. That means shifting power over federal resources from bureaucrats and special-interest groups to the tens of millions of Americans who use the public lands each year. Third, control over federal range-lands must be decentralized and diversified. That means changing the laws and regulations that rule the federal estate and transferring powers once reserved to bureaucracies to new, locally elected governing councils. Fourth, more fundamental and sweeping reforms must be examined to prepare public grazing lands for the 21st century. That means far-reaching yet sustainable changes in the nature of stewardship, control, accountability, responsibility, and, ultimately, ownership on the nation's vast federal grazing estate.

Get Federal Grazing Out of the Red

Balancing the grazing budget by raising grazing fees is politically infeasible and economically unjust, given the current capitalization of low fees for public-land grazing permits. A better alternative is to maintain the current grazing fee formula while lowering the costs of the federal grazing program to the taxpayer. That can be done effectively and equitably by shifting responsibility for range- land management, improvement, monitoring, and mitigation from federal agencies to public-land ranchers.

BLM and Forest Service Range Payments. The range betterment fund should be abolished and all federal grazing fees returned to the U.S. Treasury. Also, all supplemental appropriations for range improvements, such as the former Vale program and current stewardship programs, should be terminated. Private grazing on public lands should be funded entirely by private dollars.

Range Improvements and Water. All restrictions on private ownership of range improvements and water rights on federal lands should be lifted to facilitate and foster private investment and stewardship.

Monitoring and Mitigation Costs. All rangeland monitoring and environmental mitigation costs and responsibilities should be shifted from government agencies to public- land ranchers.

Outside Rangeland Subsidies. All federal grazing subsidies funded by ancillary agencies should be ended. Examples are federal assistance for emergency feed, herbicidal control of brush, animal damage control, and grasshopper removal.

Grazing Preferences. Grazing preferences should be eliminated. By lifting administrative ceilings on the numbers of livestock allowed on federal lands, agencies will have less cause and less leverage to overcapitalize ranges (with private and public dollars), and stockmen will have less incentive to steward artificial numbers at taxpayer expense. More important, ranchers will no longer be penalized for conservative grazing and good management. They will be able to understock their ranges without fear of jeopardizing current grazing privileges, and they will be able to capture the livestock benefits that come from prudent stocking and sound stewardship.

Rancher Self-Management. Broad ecological goals should be set by ranchers and the agencies to guide allotment management, yet the mechanics of reaching those goals--the kinds and numbers of livestock and the seasons and

timing of grazing--should be left to stockmen. That will add flexibility and efficiency to ranch operations, make independence an incentive for responsible management, and trim federal costs. Without subsidies to sustain heavy grazing and poor management, ranchers will not be tempted to graze more than the land can bear or what the U.S. Treasury could once sustain through federal largesse.

Federal Advisory Agencies. Range programs of the Natural Resources Conservation Service and the federal portion of the Cooperative Extension Service should be phased out, shifting the costs of grazing education and information to the states and the private sector.

Range Research. All federal range research grants should be ended, forcing states and the private sector to assume full responsibility for grazing innovation and development.

Agency Planning and Operations. The planning and operational budgets of the BLM and the Forest Service should be trimmed by allowing the market to determine resource uses and by decentralizing control.

Market Determination of Uses of Public Land

Multiple-use management and planning have failed to protect public-land grazing resources and to allocate them efficiently and equitably among competing user groups. A better way is to rely on markets. Range reform that is built on market forces and market incentives will move land uses more quickly and thoroughly in directions demanded by an environmentally aware and recreationally active public. Such reform will foster new sustainable uses of public lands--uses that stress wildlife and wilderness experience-- and it will do so in a manner that is fair and just to ranchers, environmentalists, and the general public.

Marketable Grazing Permits. Grazing permits should be marketable to people other than ranchers and for uses other than raising livestock. To that end, all statutory requirements that restrict grazing allotments to domestic livestock production should be eliminated, and regulations that either constrain or penalize grazing nonuse should be abolished. All Americans should be eligible to acquire, hold, and trade grazing permits and to apply them to uses that include, but are not limited to, forage for cattle, sheep, and horses. Ranchers should be free to destock their public-land ranges, and environmentalists, sportspeople, and community groups should be free to buy grazing permits from willing stockmen for wilderness protection, wildlife refuges, and outdoor recreation. All permit holders should pay fees and assume management costs sufficient to make the range programs of the BLM and the Forest Service fiscally sound.

Economic Sphere of Marketable Permits. Rangeland has economic value for recreation, wildlife viewing, big-game habitat, riparian health, clean water, and fisheries. For those values to be conserved, stewarded, and protected, permit holders--ranchers and nonranchers alike--must be allowed to capture the full value of their leased public forage. They should be given the opportunity to use riparian areas for fee-supported fishing and bird watching and upland ranges for fee-supported hunting, wildlife viewing, and recreation. If they are allowed to do those things, market forces will yield a far wider spectrum of desirable land-use outcomes than does multiple-use planning.

Markets and General Public-Land Use. Across-the-board user fees for wildlife, wilderness, and recreation should be assessed and retained by the BLM and the Forest Service. Such fees will reduce taxpayer liability. They will give the two agencies economic incentives to make management and resource allocation more responsive to the environmental and ecological values sought by the public. They will give all land users, not just organized special interests, the power to affect resource outcomes on the federal lands in the West. In addition, they will create markets for land activities that until now have been free or heavily subsidized. Such markets will facilitate putting grazing permits to economic uses other than livestock grazing and will expand the economic options available for the private-land portion of grazing allotments.

Federal Base Property. Privately owned base property should be eliminated as a condition for holding a federal grazing permit. That will enhance the marketability of permits and make them available to a broader spectrum of users.

Subleasing. Restrictions on subleasing all or portions of allotments should be lifted. The power to sublease is essential for efficient resource allocation. It will allow creation of quasi-conservation easements and will facilitate a greater diversity of uses of public grazing lands. Environmentalists and anglers seeking riparian protection will be able to enter

into sublease agreements with ranchers to remove livestock at critical times and at critical points along a stream. Sports groups and local communities will be able to sublease range forage for hunting and livestock-free recreation.

Allotment Size. All administrative constraints on allotment size should be removed, and market forces should be given free rein to restructure allotments into management units that are economically and ecologically sound.

Community Allotments. Responsible and effective self- governance on community allotments should be fostered and promoted. As an alternative, actions should be taken to dismantle community allotments and to absorb them into preexisting individual grazing allotments.

Permit Tenure. The period of tenure for public-land permits should be lengthened to a minimum of 25 years. That will give the degree of security and stability needed to encourage long-term stewardship and to diversify management of federal grazing lands.

Decentralize Public-Land Control

Range reform that substantively decentralizes management of and decisionmaking about federal lands has the potential of yielding an array of fiscal, civic, and environmental benefits. Devolution of federal authority to local, self-governing resource councils will reduce federal expenditures on resource management, expand opportunities for more effective public participation in land-use decisionmaking, and promote diverse and innovative approaches to land stewardship.

Self-Governing Resource Councils. Up to 10 experimental, self-governing resource councils should be established for a trial period of not less than 10 years in each of the major ecological zones that make up the public-land West.

- * Resource councils would correspond to grazing districts, watersheds, or other acceptable ecological divisions of public grazing lands.

- * In areas where both ranchers and nonranchers hold permits, voting and membership privileges in the councils could be based on permit ownership.

- * In areas where there is no diversity of grazing permit holders, voting and membership privileges could be granted to local residents and active users of council lands, irrespective of places of residence. Council participation could be made conditional on payment of either special land-use fees (e.g., grazing) or the purchase of an annual general-use pass (e.g., recreation).

- * Resource councils would assume existing agency authority over public-land surface resources. They would control public access to federal lands, manage community and fugitive resources, and be empowered to collect and hold special and general-use fees.

- * Federal funds now allocated to the BLM and the Forest Service for management of areas selected for experimental trials would be apportioned to the resource councils for a transition period of three to five years. After that period, the councils would finance their operations from locally collected revenues. As part of the funding experiment, federal payments in lieu of taxes could be phased out and replaced, to the extent possible, by county taxation of council revenues.

- * Resource councils would be allowed to enter capital markets to obtain funding through debt financing.

- * BLM and Forest Service responsibilities would be limited to monitoring and reporting to Congress the progress and performance of the resource councils.

Biological Diversity Trust Fund. Ten to 20 percent of council revenues should be set aside for the establishment of a biological diversity trust fund. Each council would allocate trust funds, on a competitive basis, to qualifying applicants for local projects that addressed biodiversity issues. Such projects could include purchasing grazing rights from willing ranchers or paying permit holders to focus allotment management on recovery of selected species or critical plant and

wildlife habitat.

Self-governing resource councils will give all Americans the opportunity for direct, hands-on participation in the management of federal lands through membership in one or more councils. To facilitate the workings of grassroots democracy at the council level, specific exemptions from National Environmental Policy Act's public participation requirements should be granted to the resource councils during the trial period.

Beyond Incrementalism

Range reform that is fiscally responsible, guided by market principles, and committed to deep decentralization of public-land control will yield an array of economic, environmental, and public-participation benefits. Taxpayers will be saved millions of dollars each year, public-land uses will be more responsive to what people want, and the environmental condition of public lands will be enhanced by elimination of subsidies, reliance on incentives, and the expansion of responsible and accountable local control over natural resources. Range reform need not be limited to shoring up a deeply flawed public-land grazing system or to short-term experiments in alternative management systems. Given prior policies that put all public-land users on an equal footing, remove disincentives to stewardship, and elevate markets over politics, range reform can easily be extended in any of four directions.

* Self-governing resource councils, structured on the lines suggested above, could be established for all federal lands and could be made the focal point of future decisionmaking about and management of public lands in the West. Except for initial consultation and oversight, the BLM and the Forest Service would be phased out of the business of managing public grazing lands. They would be substantially reduced in size or dismantled altogether, with residual yet necessary functions assigned elsewhere. Public access to council lands would remain open, subject only to fee assessments.

* Resource councils could be streamlined by divesting from federal ownership isolated parcels of public lands, including Section 15 BLM lands, which do not fall within the grazing districts, watersheds, and other ecological divisions that define council boundaries. Divestiture could be done by giving preference to local residents and environmental associations, by assigning tradeable shares in public lands to all Americans, or by general public bidding, subject only to first refusal rights of current permit holders and to compensation for the lost value of permits and privately owned improvements.[45] Net revenues would revert to the U.S. Treasury.

* Statutory and regulatory ties between resource councils and the federal government could be permanently severed by restructuring the councils as public corporations or conservation trusts. Membership and voting rights in those newly established governing bodies would be open to all Americans by virtue of permit holdings or the purchase of an annual, general-use pass--the equivalent of a land-use share.

* Resource councils and their members, whether tethered to or independent of federal control, could be given the option of divesting all or a portion of their publicly held lands to private ownership. Divestiture could be done by giving preference to local residents and environmental associations, by assigning tradeable shares in public lands to all Americans, or by general public bidding, subject only to first refusal rights of current permit holders and to compensation for the lost value of permits and privately owned improvements. Net revenues would revert to the U.S. Treasury.

Conclusion

Reform for America's public grazing lands is a major, national environmental issue that has arisen repeatedly over the past century without resolution. Proposals and new rules offered by Interior Secretary Bruce Babbitt offer no substantial change in the institutions and policies that have fostered and promoted degradation of public grazing lands for the past 125 years. If range reform is to lighten the fiscal burden on taxpayers, encourage the healing of abused lands, and supplant political power with people power, then it must take new directions. It must make the public-land grazing program financially self-supporting, more market oriented, and sufficiently decentralized to establish clear lines of responsibility and accountability.

Notes

- [1] Jerry L. Holechek and Karl Hess, "Free Market Policy for Public Land Grazing," *Rangelands*, April 1994, p. 63. Although public lands account for almost 20 percent of the nation's crop of lamb and wool, less than 8 percent of public-land forage is devoted to domestic sheep production. Sheep are a minor component in the overall debate about public land. They are, accordingly, deemphasized in this paper.
- [2] U.S. Department of the Interior, *Public Land Statistics*, 1993.
- [3] Jerry L. Holechek, "Policy Changes on Federal Range lands: A Perspective," *Journal of Soil and Water Conservation*, May-June 1993, p. 169.
- [4] Holechek and Hess, "Free Market Policy for Public Land Grazing," p. 63.
- [5] U.S. Forest Service and Bureau of Land Management, "Grazing Fee Review and Evaluation," February 1986, p. 2.
- [6] Letter from the New Mexico Natural History Institute, Santa Fe, to the author, February 1, 1995.
- [7] Karl Hess and Ronald J. White, "Are the Public Range lands Ailing?" *Rangelands*, December 1986, p. 280.
- [8] General Accounting Office, "Rangeland Management: More Emphasis Needed on Declining and Overstocked Grazing Allotments," June 1988; and General Accounting Office, "Public Rangelands: Some Riparian Areas Restored but Widespread Improvement Will Be Slow," June 1988.
- [9] Karl Hess, *Visions upon the Land: Man and Nature on the Western Range* (Covelo, Calif.: Island Press, 1992).
- [10] Discussion of Rangeland Reform '94 is based on U.S. Department of the Interior, Bureau of Land Management, "Rangeland Reform '94, Draft Environmental Impact State ment"; and U.S. Department of the Interior, Bureau of Land Management, "Final Rule, 43 CFR Parts 1780 and 4100," *Federal Register*, February 22, 1995, whole issue.
- [11] General Accounting Office, "Rangeland Management: Current Formula Keeps Grazing Fees Low," June 1991.
- [12] E. T. Bartlett et al., "The Market Value of Public Land Grazing: Implications for Grazing Fee Policy," in *Current Issues in Rangeland Economics* (Moscow: University of Idaho, 1994), p. 91.
- [13] Karl Hess and Jerry L. Holechek, "Range Reform Doesn't Have to Be a Lost Cause," *Sacramento Bee*, March 19, 1995.
- [14] Hess, *Visions upon the Land*, p. 131.
- [15] General Accounting Office, "Rangeland Management: Current Formula Keeps Grazing Fees Low."
- [16] U.S. Department of the Interior, Bureau of Land Management, "Final Rule, CFR Parts 1780 and 4100," p. 9895.
- [17] Hess, *Visions upon the Land*, pp. 71-72.
- [18] U.S. Department of Agriculture, Forest Service, "The Western Range," Senate Doc. no. 199, 74th Cong., 1936, p. 3.
- [19] Holechek and Hess, "Free Market Policy for Public Land Grazing," p. 64.
- [20] Hess, *Visions upon the Land*, pp. 104-20.
- [21] Karl Hess and Jerry L. Holechek, "Playing the Numbers Game," *High Country News*, forthcoming.
- [22] Karl Hess and Randal O'Toole, "Reforming the Western Range," *Different Drummer*, Spring 1994, p. 43.

- [23] General Accounting Office, "Rangeland Management: Profile of the Bureau of Land Management's Grazing Allotments and Permits," June 1992.
- [24] L. A. Torell et al., "Range Livestock Cost and Return Estimates for New Mexico, 1991," New Mexico Agricultural Experiment Station, Las Cruces, Research Paper, 1993.
- [25] Hess, *Visions upon the Land*, pp. 129-32.
- [26] *Ibid.*, p. 22.
- [27] Hess and O'Toole.
- [28] Holechek and Hess, "Free Market Policy for Public Land Grazing," pp. 64-65.
- [29] Jerry L. Holechek and Karl Hess, "Brush Control Consideration: A Financial Perspective," *Rangelands*, October 1994, pp. 193-96.
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- [35] Holechek and Hess, "Free Market Policy for Public Land Grazing," p. 63.
- [36] General Accounting Office, "Rangeland Management: More Emphasis Needed on Declining and Overstocked Grazing Allotments," pp. 49-51; and Hess, *Visions upon the Land*, p. 168.
- [37] Karl Hess, "Federal Conservation Impacts on Agriculture in Eastern New Mexico," New Mexico Department of Agriculture Special Report, February 18, 1992.
- [38] Interview with Drummond Hadley, Gray Ranch, Animas, New Mexico, September 26, 1994.
- [39] Interview with Laurie Koelbel, Colorado Open Lands Council, Denver, May 4, 1994.
- [40] Hess, *Visions upon the Land*, pp. 104-14.
- [41] Robert Nelson, "The New Range Wars," in *The Failure of Scientific Land Management* (Lanham, Md.: Rowman and Littlefield, forthcoming).
- [42] Hess, *Visions upon the Land*, pp. 104-14.
- [43] New Mexico State University Agricultural Information Office, "NMSU Scientists Search for Ways to Detoxify Locoweed," *Las Cruces Sun-News*, December 18, 1994.
- [44] Michael H. Ralphs et al., "Cattle Grazing White Locoweed in New Mexico," *Journal of Range Management*, July 1994, pp. 270-74.
- [45] Hess, *Visions upon the Land*, pp. 231-41.