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ECONOMIC ISSUES IN THE MULTIPLE-USE MANAGEMENT OF PUBLIC RANGELAND

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The Heritage of Scientific Management

The American economic system is based on the guiding principle that resources should be owned privately and their use determined by the incentives of the market. Government should stay out of the way, unless there are definite reasons to believe that the market mechanism will fail. In that case, the usual solution is regulation, designed to cure whatever defects have been identified in the market. It is rarer that the government assumes the burdens of direct ownership and public management.

The public lands are thus an anomaly. The explanation for this anomaly does not lie in any writing or theories of economists. Rather, it is to be found in history and in the convictions of the progressive movement that dominated American governmental reform of the late nineteenth and early twentieth centuries. Better than anyone else, the founder in 1905 of the Forest Service, Gifford Pinchot, exemplified the progressive beliefs that inaugurated a new era of retention and management of public lands.[1] The guiding philosophy of Pinchot and other progressives was scientific management -- much the same message that Frederick Taylor was spreading throughout the world of American business.[2] However, Pinchot and other progressives argued that in the case of the public lands scientific management also required public ownership. As the historian Samuel Hays has observed:

> The broader significance of the conservation movement stemmed from the role it played in the transformation of a decentralized, nontechnical, loosely organized society, where waste and inefficiency ran rampant, into a highly organized, technical, and centrally planned and directed social organization which could meet a complex world with efficiency and purpose. This spirit of efficiency appeared in many realms of American life, in the professional engineering societies, among forward-looking industrial management leaders, and in municipal government reform, as well as in the resource management concepts of Theodore Roosevelt. The possibilities of applying scientific and technical principles to resource development fired federal officials with enthusiasm for the future and imbued all in the conservation movement with a kindred spirit. These goals required public management, of the nation's streams because private enterprise could not afford to undertake it, of the Western lands to adjust one resource use to another. They also required new administrative methods, utilizing to the fullest extent the latest scientific knowledge and expert, disinterested personnel. This was the gospel of efficiency -- efficiency which could be realized only through planning, foresight, and conscious purpose.[3]

Despite the enthusiasm of the early progressives, the very meaning and content of scientific management remained vague. It

meant in a general way the application of the tools of science but the precise tools and the precise way in which they should be applied were not well specified. Yet, it was clear that scientific management did not mean the use of economics. The distinguished Harvard economist, Edward Mason, once described the conservation movement as "a political movement with objectives as disparate as saving the forests, destroying the monopolies, and maintaining Anglo-Saxon supremacy." But Mason found that its "economic analysis was practically non existent, though it did emphasize the importance of sustained yield in renewable resources. The best it could do in defining the meaning of conservation was to say that it meant a 'wise use of resources.'"[4]

The professional content of conservationism was defined in practice by land management professionals in fields such as forestry and rangeland science. They typically believed that the forests and rangelands should be managed to maximize production of wood, forage, and other physical outputs. The minimal input of economic thinking made it possible until recently to pay little attention to the question: how large an expenditure for wood, forage and other outputs could be socially justified by the resulting benefits?

Yet, obviously, it is impossible to spend an indefinitely large amount in producing the outputs of the public lands. The need to say how much should be spent -- what levels of investment, for example, can be justified -- inevitably raises a need for the tools of economic analysis. These tools provide methods for deciding the allocation of scarce resources among competing ends -- precisely the problem faced by natural resource managers confronted with multiple uses and multiple user groups. In the past several decades land management professionals have sought to incorporate economic methods into their thinking, although it has often been a slow and grudging process.

The progressives saw science and politics as in conflict and argued strongly that scientific management should displace politics over wide areas of government. Indeed, in this respect economics is today the leading hope for many people who still hold to the progressive goal of a scientific conduct of government.[5] Thus, an unreconstructed heir to the progressive tradition such as John Krutilla (for many years at Resources for the Future) has argued that politics should be excluded and economic analysis should become virtually the sole basis for public forestry (and rangelands) decisions. As Krutilla explains, "up until the present the instincts and proper impulses of the [forestry] profession express themselves somewhat more as high motives and sincere exhortations than as the application of operational criteria."[6] It will therefore be necessary to introduce a more truly "scientific" management of public lands,

one which accepts that the goal should be "to manage the national forests ... in order to maximize benefits" -- in short, to "pursue economic efficiency."[7]

Forestry, range science and other land management professionals have moved cautiously to integrate economic elements into their professional thinking. In addition, many observers would today argue that the scientific and objective management sought by the progressives may not be attainable. The needs for public participation, democratic decisionmaking and interest group involvement may conflict with the traditional message of scientific management. Nevertheless, to the degree that professional values and expertise are to play a basic role in determining the uses of the public lands, a large part of the burden will necessarily fall on economists. Economists have become the foremost proponents of the historic message of progressivism, espousing a new version of scientific management that might be labelled as "economic progressivism."

Issues in Rangeland Economic Planning

One task for rangeland economists is to examine the institutional framework for economic planning on public rangelands -- how economic analysis might be organized to achieve maximum effectiveness. In an idealized world of perfect information -- a world in fact often encountered in economic analysis -- the process might well work as follows. The multiple potential uses of the rangelands, many of them competing, would be reviewed and described. A full economic evaluation and assessment of each potential rangeland use would then be prepared. Considering all possible rangeland alternatives, the overall set of uses -- present and future -- would be chosen that maximized the net social value of the rangelands. In order to aggregate the values of different types of rangeland uses, the net social value of each use would have to be calculated in dollar terms.

This economic planning model underlies the planning prescription that is embodied in the requirements of the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA) and other legislation. Nevertheless, such goals for comprehensive planning ignore a critical element. Planning is itself part of the economics of rangeland management. The data and information requirements for the idealized version of comprehensive planning would be very costly to satisfy. At some point the gains from greater information and more precise analysis must fall below the costs of these activities.

Moreover, there are many types of information with respect to future events that cannot be known with certainty, even at any cost. Hence, it is impossible to develop a set of economic plans

today that can be expected to govern rangeland decisions well into the future. There will soon be new information to supplant erroneous and incomplete past information that was nevertheless incorporated into earlier planning. Yet, continuous revision of comprehensive plans to take account of the latest data and information is likely also to be prohibitively expensive.

Reflecting a growing recognition of such problems, comprehensive planning -- economic and otherwise -- has lost favor in the 1980's.[8] There has been a move throughout business and government to decentralize responsibilities to smaller units that have operational responsibilities. Privatization of government enterprises by socialist governments around the world has been a particularly powerful symbol of such world-wide economic rethinking going on during the 1980's.[9]

Information is likely to be especially incomplete on the public rangelands because of the low value of the rangeland resource. The problem of how to proceed in the presence of frequently sketchy and unreliable information thus is central to the task of economic planning on the public rangelands. Economic planning for these rangelands is in the broadest perspective a problem of managing the acquisition of information and establishing a sequence of decisionmaking to mesh properly with the requirements and constraints imposed by limited data and information.

Economic Issues in Current Rangeland Management

A proper recognition of information costs and scarcity is likely to shift rangeland planning from a misplaced past emphasis on comprehensive planning to a new emphasis on planning centered around specific resource issues. The selection of issues to be studied at any given time should reflect a number of considerations: the economic values at stake in a potential resource issue; the likelihood of any decision in the near future; the costs of obtaining the information needed for a successful resolution of the issue; and political pressures and demands that an issue be examined.

Several of the leading economic issues involving rangelands are described below. A few comments are offered with respect to the pressures bringing the issues to the forefront, key economic features, data needs, and the potential role of economic analysis.

1. **The Grazing fee** -- The grazing fee is perhaps the longest running economic controversy on the public rangelands.[10] The Forest Service first imposed a grazing fee in 1906. A particularly bitter dispute erupted in the 1920's, when the House Committee on Agriculture sought to increase fees by 300 percent.

Since World War II, there has been one struggle after another fought over the proper charge for grazing on public rangelands.

The latest installment began with congressional action in 1978 to revoke administrative discretion and to set the grazing fee legislatively. The congressionally set fee expired at the end of 1985, leaving the matter again to the Interior and Agriculture Departments. They chose to continue the method of setting the fee that Congress had established in 1978. Critics charge that this fee method is inadequate in two respects: it fails to obtain sufficient revenue to cover administrative costs of grazing and also falls well short of fair market value. Several bills are now before the Congress that would require a new fee, some of them involving significant fee increases.

While some economic attention is no doubt warranted, the grazing fee may nevertheless also offer an example of a misallocation of time and effort on the part of rangeland economists themselves. Economists should apply the principles of efficient resource allocation to their own professional activities no less than to the activities of others. The sums received from grazing fee collections are small -- equal to a total of only $14.2 million in 1987 for all BLM lands. Although fair market value may well be much higher than the current grazing fee, the equity case for raising the fee is also subject to some dispute. Past low fees -- and a reasonable expectation of continued low fees in the future -- have been capitalized in the prices of private ranches bought with Federal grazing permits attached. Any inequities resulting from low fees may well have been captured by the original ranch owner, not the current owner. Indeed, to raise fees sharply now might in some respects even create a new inequity.

The method used to estimate fair market value of Federal grazing also depends on finding private grazing leases whose value can be used as a basis for further comparison and adjustment. However, in many cases private leases represent a small number of private transactions in a sea of Federal grazing permits. The government charge for grazing becomes one of the key factors that can significantly influence the private lease rate itself. Using private lease rates to determine government lease value thus can become a circular process. The very concept of fair market value may be dubious in an economic environment where the Federal government holds so much of the resource that no independent market value can be said truly to exist. A proper calculation of fair market value therefore might require a full scale simulation (necessarily theoretical) of a grazing market. In this simulation government lands would also be entered into the calculations and the simulation would act to lease them for whatever the market would bear. Although such an approach is easily within the capacity of current computer technology, the

information requirements would be very high and the results of uncertain reliability.

In short, despite the assumptions of current law and practice, the very concept of fair market value may be an unworkable standard for setting the grazing fee on much of the current public rangelands. One alternative method of setting the fee might simply relate the fee to administrative costs. Alternatively, the fee could be based explicitly on an equity standard, determined by what seems "fair" to current ranchers. As a means of creating a stable operating environment, there would be much to be said for fixing the fee once and for all and then simply leaving it alone -- except for adjustments according to some inflation index.

2. **Below-cost grazing leases** -- The economic controversy with respect to "below-cost" timber sales has now raged for a decade or more on the public forests. By many calculations including those of the government, many Federal timber sales return less in revenue than they create in administrative and other government costs.[11] It has attracted less attention but government grazing programs also yield substantially less in grazing lease and permit revenues than the costs of operating the grazing program. For 1983, for example, the BLM and the Forest Service estimate their direct costs of the grazing program at $60.9 million, while grazing fee revenues were $24.8 million.[12] It would have required a grazing fee of $2.85 per animal unit month (AUM) to cover grazing administrative costs, as compared with the actual fee of $1.40 per AUM in 1983.

The direct costs, moreover, are only a fraction of the total direct and indirect costs of grazing. One past study estimated the full costs of grazing management and other activities to the BLM, including various forms of overhead involved in the production of rangeland forage.[13] These costs amounted to $125.4 million in 1981, equal to about $12 per AUM. The grazing fee in 1981 was less than 20 percent of these costs.

The costs of public grazing management per AUM exceed not only the grazing fee but also the best estimates of the full market value of current livestock grazing. The 1986 report of the Secretaries of Agriculture and Interior estimated a market value for livestock grazing that ranged from $4.68 per AUM in one western region to $8.55 per AUM in another region. These market values are still well below the full cost per AUM of grazing (direct and indirect) estimated in 1981.

One economic issue raised by such estimates is whether it might make economic sense for the government to seek to buy out some grazing rights. The savings in management and other costs to the government might substantially exceed the purchase price

of the grazing rights. Further economic study of the costs of grazing management might reveal a price that could be offered to the benefit of both the government and the rancher. A few pen and pencil calculations suggest that the total capital value of all livestock grazing permits on BLM lands is around $1 billion, while the present value of all future BLM administrative costs of grazing may be as much as $2 billion.

If grazing involves significant environmental costs, then the social benefits of purchasing grazing rights might be even greater. Economic studies might be undertaken to assess the feasibility and costs of purchasing grazing rights in especially sensitive areas such as wilderness areas and riparian zones. It might also be desirable to clarify the legal status of private non-profit groups that might seek to retire grazing rights in environmentally sensitive areas by purchasing these rights. At present, if a rancher were to accept a payment to cease grazing in a particular area of public rangeland, the grazing rights might revert to the government. The government could then reissue the rights to another rancher for continued grazing. A group such as the Wilderness Society thus might find itself legally uncertain of its ability to buy out and retire the grazing rights in a wilderness area, even if ranchers found the price offered to be attractive.

3. **Recreational use of rangelands** -- The proportionate amount spent by the Federal government on forage production versus recreation and wildlife departs significantly from the relative values of livestock grazing versus recreational outputs derived from BLM rangelands. In 1987, according to BLM estimates, there were 496.7 million "recreation hours" spent on BLM lands (most but not all of them rangelands).[14] If these recreation hours are valued modestly at 50 cents per hour, the total value of recreation on BLM land in 1987 would approach $250 million. In comparison, grazing fees returned $14.3 million; estimates suggest a total market value of BLM grazing of perhaps $50 to $70 million. In short, recreational outputs of BLM lands may have a value perhaps three to five times the value of livestock grazing outputs.

An economic issue thus raised is whether a shift in priorities for public rangeland expenditures to recreation would yield a higher social payoff. Studies might be undertaken by economists of the benefits and costs of recreational improvements such as campgrounds, hiking trails, scenic overlooks, access roads, visitor centers and other facilities that might make recreational use of BLM rangelands more accessible and enjoyable. The BLM might take a more active stance in organizing and publicizing recreational opportunities on public rangelands.

While recreational use of public rangelands has a large total value, the amounts paid by recreational users themselves remain very low. In 1981, total BLM revenues received from recreational and wildlife uses were only $900 thousand, compared with total direct and indirect costs estimated to be $107 million. Most recreational users of rangelands pay no fee or other charge at all.

Another important economic issue is the alternative methods of charging recreational users and the potential revenues that might be obtained. One option would be to require entrants onto BLM rangelands to have in their possession a "public access stamp" -- something like a fishing license. Stamps might be sold, for example, for $10 or $20 and might be valid for a full year. In the case of campgrounds and other limited access areas with well-defined entry points, recreational fees could be charged and collected directly on a per visitor basis.

In some cases, a point has been reached where congestion has become a problem on the public lands. Too many hunters in some locations can significantly reduce the quality of the hunting experience. In some wilderness areas, the quality of the experience may be diminished by an excessive number of visitors. Devising means of limiting hunting, wilderness visitation, and other recreational use in congested areas poses another important issue for which economic studies might be prepared. Allocation of access through the pricing mechanism has major efficiency and other advantages, but may also seem inequitable and otherwise objectionable to many local citizens.

The policies for wilderness designation and use on BLM rangelands are likely to achieve substantial visibility in the next few years. The Federal Land Policy and Management Act of 1976 (FLPMA) required the BLM to review its lands for potential wilderness designation within 15 years. The BLM identified 24 million acres of potential wilderness for further study. The Secretary of the Interior is scheduled to receive two BLM statewide wilderness studies in 1989, five in 1990, and three in 1991. The Secretary makes recommendations to the President who then has two years to make his recommendations to the Congress, where the final decisions will be made.

Economic issues relating to wilderness designation involve estimating the value of the potential uses of the wilderness. It is difficult to develop any credible estimate in dollar terms of the "existence" value of a wilderness. Nevertheless, economic studies could reasonably estimate the additional value due to increases in ordinary recreational use in wilderness areas. The making of wilderness decisions should also be supported by economic studies of the values of alternative uses that might be lost when potential future timber harvests, mining and intensive recreational uses are prohibited from wilderness areas.

Economic studies might also reveal land classifications less restrictive than wilderness that would still offer strong protections for environmental quality. These classifications might also allow for a wider range of recreational uses within protected areas. Studies might be undertaken of the demographic and income characteristics of wilderness users versus potential users of lands placed in other types of restrictive recreational classifications.

4. **Withdrawals and the mining law** -- Large areas of public rangelands (and forests) have been withdrawn from the application of the mining law. These withdrawals are intended in most cases either to preserve the environmental attractiveness of the land or to keep the land available for other future uses. As a result, mineral exploration is foregone and the opportunity to find potentially valuable minerals is precluded in many withdrawn areas.

Besides the wilderness review, the Federal Land Policy and Management Act of 1976 also directed that a review of past land withdrawals be completed within 15 years. This review has highlighted some of the difficulties of the administration of the Mining Law of 1872, which still governs the disposition of most non-energy or "hardrock" minerals on public lands.[15] Under the mining law, if surface uses are fully protected, the mining opportunity must be lost. If the way is open for mining, then valuable surface assets may be endangered.

A current key economic issue is whether a more satisfactory mechanism can be devised for resolving these surface use and mining conflicts. There is growing congressional interest in altering the mining law. If the mining law is altered, should a leasing system be substituted? If rangeland surface uses are adversely affected, what forms of compensation might be paid? Should the rangeland surface rights also be transferred to the mining company, if permission is to be granted for mining activities?

Issues in Institutional Redesign for Public Rangelands

The current philosophy of public land management dates, as noted above, all the way back to the progressive and scientific management movements of the early part of this century. These movements had a faith in the application of scientific methods, centralized planning, and professional expertise that would later be severely challenged by events of this century. In the 1980's the trend has been to break up large bureaucracies, to rely more on the discipline of the market, and to decentralize decisionmaking to local levels, where the general public has more opportunity to participate directly in decisions. Such trends

have received enormous international attention, for example, in the Soviet Union, where the movement for "perestroika" has opened the way for economic rethinking and created opportunities for economic restructurings scarcely imaginable even a few years ago. Some of the lessons from such economic rethinking going on all around the world might also be applied in the context of U.S. rangelands.

Indeed, in the last decade, a group of economic analysts have begun to explore related ideas for rethinking and restructuring of public land management in the United States.[16] If fundamental changes of the kind that have been under discussion have seemed unlikely to most U.S. observers, it might be noted that other major economic restructurings such as perestroika seemed wholly improbable as recently as five years ago.

The institutions of U.S. public land management exhibit significant elements of the institutional immobility, rigidity and inefficiency that have given large bureaucracies a bad name all around the globe. A breakup and revitalization of these management systems could be accomplished in a number of alternative ways. The study of these alternatives and their advantages and disadvantages today offers an especially important field of inquiry for rangeland economics.

1. **Long term leasing** -- Marion Clawson of Resources for the Future has offered a number of suggestions involving the possible use of long-term leasing systems for the public lands.[17] The goal would be to create private incentives for efficient and prudent management of the rangelands. If a lease allows continued operation well into the future, the private party is given the strong incentive to maintain and conserve the land, as well as to manage it efficiently for current production and profitability.

Rangeland leases might be for a period of say 50 years. The government might check the lease every five or ten years to ensure against any serious abuses. The lease might be renewed or notice given not to renew in the 35th year -- in the latter case requiring close supervision for the final 15 years. Provision would presumably be made in the lease terms for full compensation of the lessee in the event cancellation became necessary.

Long-term leases for public rangelands might be issued not only to ranchers but to other types of rangeland users as well. Leases might be issued to conservation organizations for the purpose of managing and protecting rangeland areas possessing features of special environmental sensitivity. Recreational leases might be issued to hunting and fishing clubs and/or livestock operators allowed to sublease grazing lands to such

groups. Most long-term leases would probably include stipulations guaranteeing open access to hikers and other non-obtrusive forms of ordinary dispersed recreation.

The potential range of leases and of lease terms and stipulations is broad. Different approaches might be used for different types of users or to serve different public purposes. Past experiences the private sector or in foreign nations with long-term leasing of rangelands might be studied by economists.

2. **Contracting, cooperative management and land transfers to states** -- There are still many more land tenure options that might be explored, in addition to long-term leasing. The government might sign management contracts for particular areas with ranchers, environmental groups and other potential land managers. The contracts might set performance standards, perhaps linking future payments by the government to the level of contractor performance. The contracts could be signed for varying periods and could have varying penalties for failure to meet the specific terms.

Cooperative management agreements represent a related approach to rangeland management. The BLM in 1984 established a program to sign cooperative agreements with ranchers of proven management skills.[18] The cooperative agreements allowed ranchers to exercise greater discretion in setting grazing schedules and in other management decisions concerning livestock grazing on BLM rangelands. More than 25 such agreements were signed with ranchers. However, an adverse court ruling and environmentalist criticisms that BLM was giving an excessive decisionmaking role to ranchers led to the suspension and then the abandonment of rancher cooperative agreements.

A second component of the cooperative management program involved the signing of agreements with non-profit groups for the management of recreationally and environmentally significant lands. These agreements were not affected by the court decision and the BLM has continued the program, signing more than 40 cooperative management agreements with recreational and environmental groups.

Cooperative management agreements could also be entered into with government agencies. The BLM might, for example, sign an agreement with the state to manage an area of rangeland of particular recreational interest (perhaps as a state park). More radically, it would also be possible for a state government to undertake the management of all the public rangelands within the state. The Federal government would set terms and conditions and oversee the management but by agreement would leave the routine and day-to-day tasks to state managers.

A still sharper departure would be to turn BLM lands over to state ownership. Many BLM lands do not involve resources or outputs of national significance. Instead, they serve recreational and other needs of a state and local character. Widely accepted principles of American federalism assert that where the impacts are limited to the state and to the locality, then the political responsibility and control should be placed at the state and local level.[19] An application of this basic federalism principle to BLM rangelands would yield a large scale transfer of public rangelands to state and local levels of government. Economists could contribute to the evaluation of such alternatives by examining the potential costs, efficiency and other features of each alternative.

3. **Outright sales of rangelands** -- Still another alternative would be to sell some public rangelands directly to private purchasers. Some rangelands are already landlocked by surrounding privately owned lands, making effective government management difficult or impossible. Rangelands in checkerboard areas might benefit from consolidation of public and private holdings. In other cases rangelands may be found on the fringes of urbanized areas, where they might be needed as sites for residential and other urban expansion.

Public rangelands may also be sought in some cases for second homes, resorts and other recreational purposes. In many cases the values that rangelands could generate in such recreational uses would greatly exceed the values that the rangelands could generate in livestock or other nonrecreational uses. An economic plan to maximize the total social value of the rangelands thus might require disposition of some attractive recreational sites to new private owners.

A more comprehensive plan of private sales might seek to sell some of the higher quality rangelands to private livestock operators.[20] Under any such effort the existing rancher using adjacent public rangelands would presumably be given the opportunity to buy at a preferential price ahead of other potential purchasers. Under all the sale options, rangeland areas might be kept open by stipulations in the sales requiring public access for hiking and other ordinary dispersed recreation. Studies done by economists of such private sale options might investigate potential revenues from sales, the economic efficiencies expected from private ownership, comparisons of existing public and private management practices, and other economic issues with respect to sales.

Conclusion

Economists can contribute to public rangeland management in several ways. Operating within the given framework of current public rangeland institutions, they can provide valuable economic analyses to improve the quality of the decisions made. Economists in this regard should pay particular attention to the growing importance and economic value of alternative recreational uses of rangelands. A second basic role for economists is to examine alternative institutional arrangements for rangeland management. In this regard economists can contribute by examining different property right arrangements, varying incentives thereby created, efficiency consequences of such incentives, and other important consequences of alternative institutional designs for rangeland use and production.[21]

Footnotes

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