

Economic Implications of Variable Versus Single Grazing Fees¹

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Highlight

The economic implications of variable grazing fees and single grazing fees on Federal lands are important considerations relative to further policy changes. Many factors must be considered when establishing fees on different grazing units. Quantity and quality of forage are only two of these factors and generally not the most important ones. Variable grazing fees will have to be implemented if the government is going to minimize the problem of having some of its land over-priced and some under-priced.

Establishing grazing fee² levels has long been a problem for those administering Federal lands. Each proposed fee increase has caused considerable reaction from special interest groups on both sides of the issue. The purpose of this paper is to discuss the economic implications of variable grazing fees and single grazing fees on Federal lands. Variable grazing fees are fees that vary from one grazing management unit to another in any given year. The grazing management unit may be an allotment, group of allotments, or one or more districts. The single fee is one that is the same for all land administered by a given agency in a given year.

Traditionally, the U. S. Forest Service (FS) has had a fee system that allowed for some variation between management units. Prior to 1968, the FS had 19 different base fee rates for cattle and 17 for sheep on the western national forests. Grazing allotments within forests were the administrative units where different base fees were imposed.

The other major Federal grazing land administrative agency, the Bureau of Land Management (BLM), has traditionally had a single graz-

ing fee for all grazing units. Grazing fees have varied from year to year in both agencies depending on changes in the components of their respective fee formulas.

The FS has been using a variable fee system since the 1920s. The BLM has had a single fee system since 1934. Both agencies have good reasons for wanting to retain their traditional system. Yet the agencies have been instructed by the Bureau of the Budget to follow a given set of principles and guidelines in establishing grazing fees. These principles provide that:

"Fees established on a uniform basis should be charged by all agencies for the grazing of livestock on Federal lands. . . . Fees should be based on the economic value of the use of land to the user, taking into account such factors as the quality and quantity of forage, accessibility, and market value of livestock. Economic value should be set by an appraisal that will provide a fair return to the Government and equitable treatment to the users. Competitive bidding should be used to provide reliable guidelines for establishing a fee structure that represents true market value where feasible. Where competitive bidding is not feasible, the appraisal should take into consideration comparability with fees established for comparable state and private grazing lands."³

³Executive Office of the President, Bureau of the Budget, Natural Resource User Charges: A Study, 1964.

One of the agencies (FS or BLM) is going to have to give up its traditional position on fees if they conform to the directive of establishing fees on a uniform basis by all Federal agencies. Since quantity and quality of forage and accessibility vary considerably among grazing administrative units (allotments, etc.) a variable fee system would have to be adopted to meet the directive. This would indicate that the BLM would have to give up its traditional fee system.

Economic Implications of Alternative Fee System

A brief review of past grazing-fee policy follows. Grazing fees were first assessed by the Forest Service in 1906 and by the BLM in 1936. In general, the public land agencies and the Congress were primarily interested in protection of the Federal range resources. Grazing fees were used as a means to this end by providing a source of income to pay the administrative cost of managing these lands. In most cases, grazing fees were below the value of the grazing to the user. This did not cause concern because of a policy to encourage use of the lands for settlement and development of the public land states, and there was little or no competition for use of these lands at that time.

This philosophy continued until about 1950 when the idea of market-value grazing began to receive more and more attention. For about 60 years on FS lands and for about 30 years on BLM lands, ranchers operated under a fee policy different than "fair market value." During this time period, economic forces were functioning in the allocation of public grazing to individual ranchers. This allocation process took place within the transfer regulations of the agencies.

For ranchers to qualify for the original FS and BLM grazing permits,⁴ they had to demonstrate at

⁴A grazing permit is authorization given by the Forest Service or Bureau of Land Management for a rancher to graze livestock on a given range for a given period of time.

¹Funds for research on determining variable fees for Forest Service grazing land were made available by the U. S. Forest Service. Received April 21, 1971.

²Grazing fees are defined as the amount of revenue received by the Federal government from domestic livestock grazing; they are not necessarily the same as the total cost of Federal grazing to the rancher.

least two things: (1) prior use of the land for grazing, and (2) enough private land or other grazing leases to carry their livestock while off the Federal ranges. Some ranchers got permits because they had control of water on the Federal range. Over the years there have been a few changes in the "base fees" of the agencies. However, annual changes in fees have been tied to changes in average prices received for livestock in the West.

The grazing fee formulas used by agencies prior to 1969 had little relationship to the supply of or the demand for range forage. As a result, forage on these Federal ranges was under-priced as far as grazing fees were concerned. The fact that grazing fees (the amount collected by the government) were below the market value of forage did not prevent the market from setting prices on the forage. It soon became evident that the grazing permit (the authorization to use these Federal lands) was the vehicle where these market forces were going to have an impact. As early as 1916, there were indications of value being attached to grazing permits.⁵

Permits can only be transferred with the sale of livestock or commensurate property (land or water). In the FS, the permit is turned back to the government (by the seller) and reissued to another rancher (the buyer). This value that has been capitalized into permits shows up at the time of sale either in the value of the ranch real estate or in the price paid for livestock. Yet when one investigates the market for Federal grazing he is able to find current market prices for grazing permits being quoted on given Federal grazing units.

Review of Range Forage Pricing

A brief review of the economics of range forage pricing may clarify these points. Each rancher has an idea about what he can afford to pay for an additional animal unit month (AUM) of grazing. This

value, to the rancher, is referred to as the marginal value product (MVP) of grazing. The MVP of forage is what the forage is worth at the margin in producing livestock products. Its magnitude depends on ranch organization, production relationships, market situations and the amount of forage available at a given point in time. A rancher bids for public or private grazing, assuming he meets the commensurability requirements and that grazing on public and private lands can substitute for each other. Under these conditions the forage values to the rancher in an equilibrium position would be as follows:

$$P_1 = P_2 = MVP$$

where:

P_1 = value per AUM for public grazing

P_2 = value per AUM for private grazing

MVP = marginal value product for the rancher

If the administered grazing fee is less than P_1 or P_2 then it is less than the MVP of grazing to the rancher. In the past, the grazing fee charged by the Government has been below the MVP of grazing for most ranchers. Therefore, ranchers have tried to obtain control over this low cost public grazing. As ranchers bid for control of public grazing (with a fixed grazing fee) the authorization to graze these lands took on a value. Thus, the grazing permit takes on a monetary value that is able to vary as the supply and demand conditions for grazing change.

If there is a reasonable amount of competition and a relatively free market for grazing, then the capitalized difference between the total fee and non-fee costs (excluding the permit value) of using public and the total fee and non-fee costs of using private grazing should equal the permit value for some reasonable capitalization rate. This hypothesis was tested in a pilot study in Utah.⁶ The results of the pilot

study did not find evidence to reject the hypothesis that the differential capitalized at a reasonable rate would equal the permit value. It was concluded that there is a reasonable amount of competition in the forage market, given the transfer restrictions imposed by Government, and that a relatively free competitive market exists for public grazing.⁷ If a competitive market does not exist, there is no reason to expect the capitalized differential between public and private costs of grazing to equal the average permit value. It should also be pointed out that if a competitive market does not exist, one has no economic basis for using private lease rates to set public grazing fees.

Implications of Full Market Value

A grazing fee policy to collect full market value of the forage in fees would eliminate the permit value. It is only at the point where the permit value is zero that the government is getting full market value in fees. As long as ranchers are willing to pay each other for grazing permits, the government is not getting full market value in fees. If the fee and non-fee costs of using government land for grazing are higher than the rancher's MVP he would be unable to pay for the forage in the long-run, and it would have no value to him, i.e., he would not be willing to go out and try to buy more permits on the allotment. On the other hand, if the fee and non-fee costs are lower than his MVP for grazing, he can still afford to bid and pay for permits, thus giving them some value. In other

⁷The Forest Service and the Bureau of Land Management have commensurability requirements that must be met before a rancher can qualify for a grazing permit. For a rancher to meet this requirement, he must have enough private land resources to provide feed for the permitted livestock while not on the Federal lands. Whether institutional barriers to a free market are significantly limiting competition has been tested in other areas with different results; see: Gardner. 1962. Transfer Restrictions and Misallocations in Grazing Public Range. 44 J. Farm Econ., No. 1.

⁵Peffer, E. Louise. 1951. The Closing of the Public Domain, Stanford Univ. Press. 186 p.

⁶Jensen, Bartell C., and Don Thomas. 1967. Determining Grazing Fees on National Forests. Unpublished report to the U. S. Forest Service, Utah State Univ.

words, the market value of the permit is approximately equal to the capitalized differential between the value of the forage and the cost of utilizing it by the second most efficient user of the range. The rancher who bids it away in the market might still be capturing some rent, i.e., the fee and non-fee cost plus the interest (cost of owning) on the market value of the permit may still be below this rancher's MVP of an AUM of grazing. If this is the case, there would still be some rent not captured in the permit value. If these rents (differentials) are substantial, the government could extract part or all of them by raising fees over and above what would be necessary to make the market permit value go to zero. The efficient rancher could still afford to use the land and would not declare non-use. The above discussion of forage valuation and grazing fee systems is the basis upon which problems of variable versus single fees are analyzed.

Given the goal of the government to collect full market value of the forage in grazing fees, there are several economic implications of variable versus single fees. For purposes of this paper, full market value (the revenue which theoretically could be captured by the government) of the forage will be defined as follows:

$$(1) \quad F = MVP - E$$

where:

F = full market value of the forage per AUM
 MVP = market value of the forage determined from private lease rates⁸
 E = non-fee costs of using public ranges

A summary of the cost data used in setting the new grazing fees is given in Table 1.

⁸ It is assumed that private lease rates represent the MVP of grazing to at least the second most efficient user of the resource. At any rate, the private lease rate, set in a competitive market, comes nearer to estimating the MVP of grazing than any other economic indicator available.

Table 1. Summary of combined average public costs and private costs per animal unit month, 1966.¹

Itemized costs	Cattle		Sheep	
	Combined public costs	Private costs	Combined public costs	Private costs
Lost animals	\$.60	\$.37	\$.70	\$.65
Association fee	.08	—	.04	—
Veterinary	.11	.13	.11	.11
Moving livestock to and from allotments	.24	.25	.42	.38
Herding	.46	.19	1.33	1.16
Salting and feeding	.56	.83	.55	.45
Travel to and from allotments	.32	.25	.49	.43
Water	.08	.06	.15	.16
Fence maintenance	.24	.25	.09	.15
Horse	.16	.10	.16	.07
Water maintenance	.19	.15	.11	.09
Developmental depreciation	.11	.03	.09	.02
Other costs	.13	.14	.29	.22
Private lease rate	—	1.79	—	1.77
Total costs	\$3.28	\$4.54	\$4.53	\$5.66
Difference		\$1.26 ²		\$1.13 ²
Weighted average			\$1.23	

¹ Developed from data analysis of the grazing fees technical committee, November 29, 1968.

² The difference weighted by corresponding AUMs results in weighted average of \$1.23.

Data from Table 1 can be used in equation (1) to determine the grazing fee. For cattle the fee would be as follows:

$$F = \$4.54 - \$3.28$$

$$F = \$1.26$$

Forest Service grazing fees averaged \$.51 per AUM prior to the new fee schedule. Therefore, fees will have to be increased \$.75 per AUM in order to approach full market value. If the decision is made to have a single grazing fee for all Federal grazing lands, the new fee would be \$1.26 per AUM. This would be full market value for grazing for the average permittee. But, working with averages creates peculiar problems when one attempts to set fees on Federal grazing lands on this basis.

Total cost of using public and private grazing lands varies from one permittee to another. There are several reasons why one would expect variation between the costs of individual permittees or groups of permittees.

Grazing allotments are not equally accessible to all permittees.

Those remote grazing allotments with poor accessibility would have higher non-fee costs than a readily accessible allotment. The variation in non-fee costs for permittees due to accessibility is quite pronounced. In addition to the accessibility difference, there is considerable variation in the management functions required by the land management agency which are paid for by the permittees. Some allotments have progressive programs underway that cost the permittees money; others have few programs for improved management; thus, low costs for required management functions. These non-fee cost differences should be reflected in the grazing fee.

Local supply and demand situations for forage will have a significant effect on the price of forage. For example, a given locality may have an excess of summer grazing. Thus, the price of summer grazing may be relatively low, while in another locality summer grazing may be in short supply relative to demand; thus it commands a high

price. These conditions could vary considerably from one area to another. Supply and demand situations in a local area can cause high quality forage in a glut season to sell for less than poor quality forage in a short season.

Assumptions vs. Data

Many people believe that forage quality should play a vital role in determining grazing fee levels, i.e., the higher the quality and quantity of forage per acre, the higher the fee per AUM. The data available do not support this notion. Forage quality and quantity do not have a very high correlation with what ranchers are willing to pay for the forage. The usual response to this analysis is: "Any rational rancher would pay more for grazing on high quality improved ranges than he would for grazing on low producing, unimproved sagebrush ranges." At a given location (the two ranges side by side) and at a given point in time, the better range would command a higher price. However, the given-location and the given-point-in-time qualification soon break down. Ranchers face different supply and demand conditions in different areas and at different times of the year. For example, high mountain summer grazing on FS lands would have a quality and quantity index above most desert winter ranges. Yet it is highly possible that ranchers are willing to pay as much or more per AUM for the winter range. Ranchers may have many alternative sources of feed for the summer grazing, but the only alternative for the winter grazing might be to feed hay.

A rancher in Oregon may have only dry, cheatgrass (*Bromus tectorum*) ranges for summer use, while a rancher in Montana may have lush mountain meadows available for summer use, yet it is entirely conceivable that the rancher in Oregon would pay as much for the "cheat grass" range as the rancher in Montana pays for the lush mountain meadow per AUM.

Local supply and demand conditions for livestock forage are far more important in determining prices than the quality of forage.

Ranches that are efficient in the production of livestock products can probably pay more for forage than ranches that are not so well organized or managed. Thus we have differences in the MVP of individual ranches, which is reflected in the total price they can rationally pay for forage.

Other Fee Considerations

Therefore, full market value of grazing is different for each permittee or at least for different groups of permittees. If grazing fees are to meet the goal of collecting full market value of grazing, the amount of variation in the differential between total cost of using public (cost of permit not included) and the total cost of using private leased ranges should be minimized among groups of permittees.

If permittees can be stratified into grazing fee market areas where their total cost differentials are more nearly homogenous, the variation within each group or market area would be much less than when all permittees are grouped together. In addition, the government would come nearer its goal of collecting full market value in grazing fees.

In fact, if one adopts a single fee policy, he is accepting the maximum amount of variation in total cost differentials. Any stratification into market areas could have no more variation than would be the case with a single fee. It is quite likely that one could reduce this variation if available data were grouped into rather rough market areas.

To set up grazing fee market areas that would minimize the variation, one would have to determine the level in the grazing organizational structure where the variation occurs. It might be at the forest or district level or it might be that the variation arises at the grazing allotment level. If the variation is at the grazing allotment

level, one would have to make his stratifications and establish market areas of grazing allotments. One of the arguments against variable fees is that there is as much variation within forests and districts as there is between forests and districts. If this is the case, one should go to the grazing allotments within forests or districts to determine market areas or fee areas as they did in the 1920's.

The peculiar problems associated with a single fee for all Federal grazing can be shown by a hypothetical example. Suppose the total cost differential is computed for each individual permittee grazing Federal ranges. Let's assume that when plotted as a probability density function that the density function has the same shape as the "normal curve." In this example, the mean or average differential would be \$.75 per AUM. This would also indicate that half the ranchers had cost differentials less than or equal to \$.75 and half would have cost differentials greater than or equal to \$.75.

The problem is not serious for permittees that have differentials near the mean. It is serious, however, when the differentials get significantly larger or smaller than the mean. Permittees with differentials significantly lower than the mean may not be able to pay the new fee. If their differential is low because of inefficiency in production, another more efficient rancher might buy them out or take up the permit if it is turned in. This situation is not too serious because the resource is still being used. However, as grazing fees are pushed to the average full market value, there will be a considerable amount of the range resource that will be priced out of use for grazing because the fee costs are just too high. The remote, or low productive ranges, or the high cost management ranges, or those where livestock losses to poisonous plants are high, will go unused. In these situations even the efficient rancher cannot afford to use them.

Question of Resource Use

Should these range resources go unused? Of course, the answer to this question will have to be made by the administering agency. However, there are a few points that should be considered when looking at the problem from society's point-of-view. The Federal range is a public resource, so we are justified in analyzing the problem from a societal level. Assuming that grazing is properly managed and no damage is done to the resource, we have a flow resource that can be used annually to get the benefits. Non-use of a properly used good to excellent condition range does not represent rational conservation. The forage produced simply goes to waste.

One should also determine, if possible, the marginal cost of managing these types of ranges. In all probability, these extremely high cost ranges would be a small portion of the total resource being managed by a given management unit. Therefore, the marginal cost would be low or it might be zero. Thus, this resource should be used even if the grazing fees had to be set at zero. Society would be better off because an otherwise unused resource would now be used and would make a contribution to the production of goods for use by society. If one considered all of the benefits and costs, he might find that society, through a government agency, could afford to pay some of

the costs so that an unused resource could be used and add to the production of goods and services for society.

Getting back to the discussion of these high priced ranges, permittees may attempt to pay more than their MVP for using these range "resources." How long this will go on is difficult to estimate. However, in the long-run they cannot afford to pay more than their MVP for grazing. Thus, one would expect a period of adjustment before he knew how extensive the non-use of the resource would be.

On the side of the mean fee value we have those permittees who have a differential greater than \$.75 per AUM. Federal grazing is still a bargain for these ranchers. They would be willing to pay for the authorization to hold these permits. Thus, the permit value is not zero and the government is not collecting full market value. If the magnitude of the differential is caused by low non-fee costs of using the Federal range, there would be many bidders for these permits. On the other hand, if the differential exists only because some ranchers are more efficient than others (this would be reflected in their MVP for grazing) then the small, generally inefficient ranchers would not be bidding for the grazing. Undoubtedly the high differentials are caused by a combination of lower non-fee costs and rancher efficiency.

At any rate, it is only at or near

the mean that government would be reaching its goal of collecting full market value of the grazing. The government would still be faced with the problem of having some of its land under-priced and some over-priced. A competitive bid system of fees where each individual could bid for control of public grazing would come nearer than any other fee system in achieving the goal of collecting full market value. This assumes enough competition in each grazing area to force the bids up near the MVP of the successful bidder. Given present-day communications and ability to move livestock, there would be very few Federal ranges that would be monopolized by a single rancher.

Apparently the intent of the Federal government is not to go to the extreme of competitive bid grazing fees. We then have to settle for a somewhat arbitrary institutionalized system of setting fees. The single fee system is the least effective system of collecting full market value of grazing from all users. Several other methods have been tried in an attempt to arrive at a reasonable method of setting variable fees. The data currently available does not provide the best possible means of setting variable fees. However, it does provide enough information to set variable fees that would bring the government closer to its goal than is the case with a single fee.

Outcome of Annual Election

Ballots cast in the 1971 annual election were counted on December 9. Selected by the membership to serve the Society during the next three years were:

President Elect—Martin H. Gonzalez

Directors—John H. Ehrenreich, F. Robert Gartner

The new officers will be installed at the forthcoming Annual Meeting, at which time Dr. Floyd E. Kinsinger, the current president elect, will succeed to the presidency. Dr. Gonzalez will serve as president in 1973 and the two newly-elected directors will serve for the three-year term 1972-74.

Retiring next month from the Board of Directors will be Wm. D. Hurst, past president, and Dillard H. Gates and David G. Wilson, directors. Their contributions to the Society have been of significant value and are sincerely appreciated.

The 1971 Elections Committee, responsible for counting the ballots received, consisted of James B. Bryan, George L. Burnett, Richard E. Greffenius, Charles W. Luscher, J. Robert Owen, Milton M. Wright, and Francis T. Colbert.