GOVERNMENT POLICY AND THE BEEF INDUSTRY IN THE WEST

by B. D. Gardner and N. K. Roberts

Livestock ranching was one of the early industries established by the white man in the West. For half a century it provided the only economic use for much of the forage resource in the area. Crop production on irrigated farms sustained range livestock during the winter months.

During these early years there were no government programs for resource protection. Usually the rancher homesteaded small parcels of land near water and used in addition, vast acreages of nearby public land for his grazing stock. The stockmen were pretty much unrestricted in their use of public forage, and they pushed their opportunities to the limit. Each rancher knew that if his stock didn't get the grass, some other rancher's would. The inevitable result was widespread depletion of range forage and destruction of land and water resources.

Near the end of the 19th century the conservation movement gathered enough momentum to produce some government action programs in the West. Forage resources were in extremely bad shape. Moreover it became apparent that our rapidly growing country was soon going to need vast quantities of timber and minerals as well as grass. The result was the creation of the Forest Service in 1897 and the Bureau of Land Management in 1936. The primary interest of both agencies has always been to develop and conserve the natural resources under their charge.

At present practically all of the public land in the 11 western states is used for multiple purposes. Most of it simultaneously produces plant cover, functions as a watershed, and supports domestic livestock and game animals. Emphasis often is placed on some particular use, however. Many areas have distinctive value as recreation sites of various kinds. Others are better adapted to the production of timber and minerals.

Different types of policies have emerged over the years in attempts to "solve" the varied problems associated with complex patterns of resource use.

The problems concerned with allocating existing public resources among uses which compete for them have received much attention in the last few years. There have not been markets to establish economic values of the various uses. Thus political factors have been more important than economic factors in settling conflicts arising in allocating resources among uses.

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Other problems concern allocating resources among individual users within a given use. For example, policies exist which attempt to ration a given amount of grazing to certain stockmen. Much of this chapter concerns these policies and their impact on the ranching firm.

Finally, other problems are encountered in developing and preserving resources. This chapter also considers policies that affect the level of investment in range management and improvement. The total quantity and quality of forage available to the livestock industries in the West are affected by improvements made.

The federal government owns about 400 million acres of land in the 11 western states, slightly more than one-half of the total land area. The Forest Service in the Department of Agriculture administers about 170 million acres; the Bureau of Land Management (BLM) in the Department of Interior manages about 180 million acres. Several other agencies are responsible for the remaining 50 million acres.

Acreages, however, may overstate the importance of these lands to the livestock industry. In 1961 forest lands supplied only about 5.5 per cent of the total feed requirements for the beef cattle and sheep industries in the 11 western states. The BLM lands supplied about 11.7 per cent, making a total of about 17.2 per cent. Approximately 3.5 per cent of the ranchers in these two industries in the West hold Forest Service permits while about 27 per cent have BLM permits or leases. Of course, some forest permittees may hold BLM permits as well. These figures suggest that a substantial number of ranchers are affected by grazing policies of these two agencies. In fact, some permittees take very sizeable proportions of their total feed supply from the public lands, although all must supply some feed from their own private land to be eligible to obtain grazing permits on the public land.

**Present Grazing Policies and their Impact on the Ranching Firm**

The Forest Service presently permits grazing equal to about 7 million Aum's (animal-unit-months) annually. BLM grazing amounts to about 15 million AUM's annually. Both agencies use a system of permits which authorizes a specified amount of grazing on a given land area for a fixed season of use. The forest term "allotment," will be used to designate the grazing area.

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Permits generally have duration of 10 years, but the agencies can reduce the grazing quantity in the permit whenever agency officials think it necessary.

Some assumptions will simplify the real world complexities and enable us to identify important relationships. Assume, first, that each allotment is grazed by the stock of a single permittee. Let us initially suppose, also, that the rancher is not restricted as to how he must use the allotment. He can stock it at any rate he wishes. Each stocking rate per allotment per season will have a certain value to the rancher in terms of animal production and/or maintenance. Let us call this series of values at various stocking rates the demand for grazing.

Many factors will influence this demand relationship. The important ones are the quantity of federal grazing used relative to other production inputs, the price of the livestock production which is produced, the weather and other production conditions beyond the control of the rancher, and the "state of the arts" or technology of production.

As the price of the animal production from grazing increases, the demand for grazing services will rise. If we assume perfect competition in the product market, however, the product price will be unaffected by the actions of the ranching firm and can be assumed as given. Consequently, it cannot shift demand as the rancher alters the stocking rate.

The most important weather conditions affecting forage production are rainfall and length of growing season. For the most part these are beyond the control of the stockman and cannot be altered by management decisions. We will, therefore, assume this factor to be constant in our analysis.

Improvements in technology of forage production are usually accompanied by increasing output per dollar of cost. The same can be said for developments in animal technology. Our attention, however, must be limited initially to other phenomena, so we will assume technology to be given also. This assumption will be relaxed when we look at ranching as a dynamic industry over the long pull.

Under this set of assumptions, changes in demand can be attributable only to changes in the quantity of public grazing used relative to other inputs. Taking greater quantities of public grazing on an allotment involves increasing the stocking rate. Fig. 1 shows hypothetical functional demand relationship (D) between the stocking rate and the value of livestock production and/or maintenance.

We would expect that as long as forage is abundant and livestock do not compete for it to any perceptible extent, increasing the stocking rate would increase livestock product at a constant rate. The value of grazing will be constant at a high level at low stocking rates. As the stocking
rate increases to the point where animals compete for forage, however, the value of increased stocking rates would decline. As the stocking rate is further increased, a point might be reached where forage becomes so scarce that the livestock cannot even maintain themselves and value may be negative as shown in Fig. 1.

![Dollar Value of Livestock Production and/or Maintenance](image-url)

Fig. 1

Stocking rate per allotment per season
Assume that the non-fee marginal costs of grazing the number of animals implied by each stocking rate are constant at $MC$ in Fig. 1. Suppose the agencies charge a fee indicated symbolically by $f$. The non-fee marginal cost plus the fee equals $MC'$ in Fig. 1. In the absence of stocking rate controls, and assuming the rancher acts in such a way as to maximize profits, he would logically choose the stocking rate $q_0$, where marginal cost equals value of grazing.\(^5\)

Of course, this stocking rate may not be maintainable over the years. If perpetuated, the rate may produce overgrazing and reduce the quality and quantity of range forage over time. If so, demand will fall until an equilibrium position is reached at some sustained yield level of forage production where $MC'$ equals some stable demand curve.

As we indicated earlier, a primary reason for entry of the government agencies into the land management field was to protect and preserve resources. Both the Forest Service and the BLM have set the quantity of grazing to be allowed on a given allotment. A reasonable assumption is that the agencies attempt to manage the forage resources in such a way as to maximize forage production over time. The maximum sustained level of forage production can be defined as the renewable limit. Since other uses compete for forage resources, the quantity allocated to livestock grazing is most often below the renewable limit. Accordingly, suppose the quantity of forage allocated to livestock grazing is fixed at stocking rate $S_0$ in Fig. 1, and that $S_0$ is below the renewable limit.

The demand relationship is obviously not independent of the level of total forage use. If range condition is below maximum forage potential and forage use is below that level required to maintain present range condition, the quantity and quality of forage will increase over time and demand will rise. If range condition is at the maximum level of production, forage resources are wasted if they are under-utilized. The opposite results occur if forage use surpasses the renewable limit; i.e., the range then deteriorates in plant quantity and quality. For simplicity, we will assume that the agencies fix $S_0$ at that level where $S_0$ plus other forage uses equals the renewable limit. Thus, demand does not shift over time as a result of changing range condition.

If the stocking rate, and the implied AUM's of grazing are at $q_1$, the value per unit of this forage is $P_1$. Assuming the fee plus other costs of using the public range to be $MC'$ or $P_0$, it follows that the forage is being "underpriced." That is to say, at price $P_0$ there is more demand than

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\(^5\)For the reader who may be acquainted with the terminology in economics, the schedule we have called a demand curve is really a value of marginal product schedule, and represents the value of incremental increases in stocking rates. The traditional concept that profits are maximized where marginal returns are equal to marginal costs is fulfilled at $q_0$ in Fig. 1.
supply and some rationing system must be used to allocate the grazing.

Both the Forest Service and the BLM have devised rationing systems to allocate supplies of livestock forage. The agencies grant permits only to ranchers who meet certain prerequisites. When permits were originally issued, ranchers had to have been "prior-users" of the range before the government began to manage it. Stockmen now must have "commensurate" base property to maintain stock during that part of the year when they are not using the public range. The ranch must be "dependent" on public land for a "well-balanced" livestock operation. These currently are the main prerequisites. When they are rigidly adhered to, a large number (perhaps a majority) of western ranchers are ineligible with their present ranching setups. Those who do qualify are forced to maintain the eligibility prerequisites, which often conflict with economic efficiency. Fulfilling the prerequisites increases the cost of production to the rancher. We will assume that these "extra" costs of maintaining eligibility will increase the marginal costs to MC'' in Fig. 1.

At the stocking rate q1 the distance between P1 and P2 is "surplus value" per unit of stocking rate. To the extent that the regulations allow permits to be transferred between ranchers without private base property or other appendages, this "surplus" will be capitalized into permit values. If base properties or livestock must be transferred with the permit, some of the "surplus" will be capitalized into these assets, and they will carry higher values than their own productivity alone would warrant.

Original rancher permittees received a windfall. That is the "surplus value" represented by the area P1P2 times q1 was capitalized into permit values and/or inflated base property. This doesn't mean, however, that these ranchers were necessarily better off than before the range was incorporated into a forest or grazing district. They were then grazing without fee, so a substantial windfall was wiped out when public management and charging of fees were instituted. In fact, the public range was "underpriced" when the first permits were issued largely because of resistance to competitive pricing from the ranchers who had been using the range without charge.

Consider the situation of a rancher who did not receive a permit initially but who later acquired one formerly held by another. This rancher must meet prerequisites and thus incur more cost. In addition, he must

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purchase the permit and base property if he cannot provide his own. In any case, he gets no "surplus" as the original permittee did. It is clear, therefore, that sustained "underpricing" does not involve a subsidy to succeeding generations of permittee ranchers.

Thus far we have not presented empirical support for the relationships we have postulated.

Consider the evidence that public grazing has been underpriced. It is apparent that if the cost of grazing were equal to its value a rationing system to allocate the forage among ranchers would be entirely superfluous. Those who were willing to pay the price would be able to acquire the grazing. The existence and use of a complex rationing system, therefore, is evidence that public forage is underpriced, and that demand exceeds supply.

It is similarly apparent that before grazing permits can have market value two conditions must be met. Some differential between the value and cost of grazing must be available for capitalization into permit values. Some provision must also be made in the regulations for transfer of grazing permits from one rancher to another in order for a market value to exist. The fact that one can go into any community in the West where public grazing is an integral part of ranching and find values quoted for public grazing permits demonstrates that these two conditions have been met. In a study\(^7\) of northwestern Colorado ranches in 1958, we found Forest Service permits being transferred at an average value of $16.45 per AUM. BLM permits had an average value of $10.95. More recent data\(^8\) from Utah show that forest permits are presently being transferred at a price ranging from $16 to $25 with the average being about $20 per AUM. BLM permits are moving within a range of $8 to $14 with an average of $10 per AUM. It should be made clear that these market values were appraised independently of attached base properties. That is, the transferable value of the public grazing was completely captured in the permit values.

We are not arguing that the full differential between the fee and the value of public grazing is capitalized into permit values. The fact that many ranchers cannot meet eligibility requirements undoubtedly reduces the demand price. In addition, the stringent prerequisites reduce transfer possibilities. Ranchers who get permits incur costs in maintaining eligibility. This reduces the net value of permits. Lower permit prices therefore result from eligibility requirements and transfer impediments.

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These factors cause misallocation since the forage cannot be transferred to ranchers who could use it most efficiently and who would acquire it in a free market. Nevertheless, permits could not have value unless the public grazing is underpriced. It is likewise evident that the owner of the forage resources, the general public, is not realizing full value of the forage in fee receipts.

It is often tempting to compare rentals from private grazing lands to fees for public grazing of similar quality. Such a comparison is not completely valid. The private rental ordinarily includes the value of various services provided to the renter by the landlord; these are not provided to permittees by the government. Stated in another way, the rancher incurs non-fee costs in grazing the public range which are not incurred if he rents private range. Some examples are greater transportation costs, herding and fencing costs, and usually, additional death losses and lower calf crops. To be strictly comparable to private rentals these costs should be added to the fee.

Private range lands in the West are being rented at prices from $2.50 to $4.00 per AUM at the present time while the BLM fee is $0.19 and the average Forest Service fee is about $0.60. It has been estimated that "added" costs of running animals on the forest in northwestern Colorado amount to about $1.33 per AUM. Assuming this figure applies to all public lands, the sums of fee plus "added" cost are $1.52 and $1.93 per AUM for the BLM and forest lands, respectively. The marginal cost of an AUM of public grazing is less, therefore, than an AUM of private grazing. This comparison, however, does not allow for the fixed cost required to obtain the public grazing permit. It is impossible, therefore, to conclude from these figures that public grazing is necessarily the more profitable.

One minor point should be cleared up. Both the BLM and the Forest Service determine fees by formulas which require that the fee change in rough proportion to changes in livestock prices. This means that livestock prices and fees remain approximately constant over time relative to each other. This must not be confused, however, with the proposition that the fee is equal to the value of the grazing. This is false.

The impact of these pricing and allocating policies on the ranch firm that leases grazing is pronounced and sometimes critical.

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9This argument is elaborated in B. D. Gardner, "Transfer Restrictions..." Op. Cit.


We have postulated that if ranchers were free to determine how much public grazing they would take in any given season, they would maximize profits by taking that number of AUM's where marginal cost equals marginal revenue. Marginal revenue is approximately equal to the private market value of an AUM of grazing. We have demonstrated that "underpricing" exists. In a perfectly competitive market this is equivalent to saying that marginal cost is below marginal revenue. The rancher desires more grazing than is available to him at present fees. In other words, there is an economic shortage of public grazing at prevailing fees. Rationing systems rather than price allocate grazing quantities, and these are inefficient in the sense that we can never be sure that the grazing is used by those to whom it has maximum value.

Current pricing and allocating systems also exert considerable influence on the asset structure in ranching. The sales value of a ranch depends largely on how many animal-units it can support. In areas where public grazing tenure seems reasonably secure, ranches with some public grazing often have sales values per animal-unit just as great as where all forage is supplied by private lands. For example, ranches may be selling for $500 per cow, and it doesn't matter whether the carrying capacity is produced on both private and public land or alternatively, on private land only. Where this situation prevails, the seller of a ranch might be able to capture the full value of the attached public lands.

In most areas, however, the ranch sales price per animal-unit is lower if part of the grazing is supplied from the public land. No doubt this is so because an AUM of carrying capacity can't be as valuable if its future use is uncertain. Still, private land that has a permit attached to it is always worth more than private land of similar productivity that doesn't.

As a result, ranchers who have access to public grazing have a substantial amount of wealth tied up in grazing permits and inflated private base properties to which permits are often attached.

Peak grazing on the forests occurred in 1918, when over 20 million AUM's were grazed. By 1933 the number of AUM's had been reduced to about 13 million; by 1961, to about 7 million. AUM's on the grazing districts of the Bureau of Land Management have remained substantially constant since 1940, although it is beginning to appear that the BLM is considering grazing reductions also. Since no compensation is paid to the rancher when the

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12This particular situation seemed to be the case in certain areas studied in Northwestern Colorado. It was especially true where the public land was BLM parcels where individual ranchers had almost exclusive use.
agencies reduce grazing, the rancher suffers a loss of wealth. The extent of the loss depends upon the value of the cancelled grazing and any reduction in the value of his own base property. If ranchers have lost 13 million AUM's of forest grazing since 1918, this amounts to a loss of 260 million dollars, assuming each AUM to be worth $20 in 1961 prices. Generally, the public range supplies grazing for certain seasons; if it is eliminated, the complete ranching program is disrupted. The loss sustained by the rancher might be substantially greater, therefore, than the sum directly attributable to the permit itself.

When part of the forage supply of the ranch is eliminated, the rancher must seek other feed sources if he is to maintain his herd and his ranching business. Other things being equal, other feed prices will rise above the levels that would persist if public grazing had not been reduced.

How much feed prices will be affected depends on the size of the public grazing cut, the importance of public grazing to the individual rancher, the possibilities of utilizing other feed substitutes, and reductions in herd size that might follow grazing cuts. Conceivably, herd size might be reduced by the same proportion as that represented by the reduction in public forage relative to the total feed supply. This would leave the demand for other feeds unchanged. Such an occurrence is extremely unlikely, however, as animal-units of grazing stock in the West have been increasing despite reductions in public grazing. Furthermore, public grazing has contributed less than one-fifth of the total feed supply. This means that an annual loss of 1 million AUM's (a comparatively large cut) would reduce public grazing by about 5 per cent and the total feed supply in the West by about 1 per cent. It seems plausible, therefore, that an annual loss of a million AUM's would not substantially alter the relative costs between feed sources and therefore would not perceptibly drive up feed prices. It must be admitted, however, that substitutes for lost forage would not be easy to find in all cases. Wealth losses always occur when permits are cut, and such cuts may cause financial hardship, especially in the short-run, for ranchers operating on narrow margins.

**Anticipated Policy Changes and their Impact**

The foregoing analysis suggests that grazing policy has misallocated resources among uses and users and has inequitably distributed the economic returns. That is, on the one hand transfer impediments, uncompensated grazing cuts, and "underpricing" have prevented optimum efficiency of resource use. On the other hand, the resource owners, the public, have been shortchanged in that they have not collected the full value of the forage. In addition, ranchers are operating under an inefficient rationing system not of their making, and they stand to lose substantial amounts of wealth as resources used for grazing are transferred to other uses.
Pressures to correct these difficulties have been growing in recent years. In general, the public seems to be increasingly aware of the potential value of its once inaccessible resources in the West. Better transportation, more leisure time, longer vacations, preferences for more outdoor recreation, and higher incomes have fostered wider and more active interest by more people. In addition, local pressures for re-examining public land policy have grown as population has shifted from rural to urban pursuits and emphasis has shifted from ranching to recreational uses of public lands.

Supplies of livestock forage on public ranges can be expected to decrease as demand for recreation, in its various extensive and intensive forms, and interest in conservation and watershed development increase. Outdoor recreation has manifold components: hunting, fishing, camping, picnicking, sightseeing, hiking, and others. All of these become competitive at some point with livestock grazing.

A changing public attitude toward natural resources will almost certainly result in eventual changes in Federal land management policies. These measures will probably take the form of increased grazing fees, a continued reduction in public forage allocated to grazing use, and perhaps a relaxation of permit transfer restrictions.

The general public impression that past grazing policies have subsidized ranchers will generate pressure for increased grazing fees. In many quarters it is argued that ranchers receive a continuing subsidy as long as underpricing exists. This claim is largely erroneous as we demonstrated in the last section. The complete windfall from underpricing was captured by the first generation of permittees. Successive generations have paid "full" value for public grazing and have not received windfall gains except as there have been unexpected increases in the value of grazing relative to fees. Because fees change relative to livestock prices even this possibility has been largely eliminated.

Of course, the livestock industry did receive windfall gains and the public was shortchanged in the original permit issue. However, we would ask the question: Is it in the public interest to impose wealth losses on one group of citizens (present permittees) to compensate for the wealth subsidies granted to a different group (original permittees) many years ago? This would be one specific effect of an increase in grazing fees.

In the short run, ranchers will suffer a decline in annual income by the amount of additional fees paid. In terms of Fig. 1, the MC will increase by the amount of the fee change per unit. If the rancher were just covering his average variable costs before, an increase in the fee might force him out of business unless other compensating factors come to his rescue. We say it this way because data developed from a recent ranching study14 in Utah.

indicate that current fees compose 3 to 8 per cent of total cash costs of ranches using public lands. Generally, the fee part of ranchers' cash costs is even lower in other areas of the West. A change in price of $1 per hundredweight for livestock sold would have about twice the effect on net income as would doubling the BLM fee and increasing the Forest Service fee by $0.20 per AUM over 1960 levels. Ranch income is much more sensitive to product price changes than to substantial grazing fee increases. Still, even small fee increases might cause severe stress to ranches just breaking even.

The effect on capital asset values of fee increases is closely related to the fall in annual income. Recall our previous conclusion that the difference between the net value of forage at assigned stocking rates and the fee has been captured in higher permit and base property values. An increase in fees will reduce this difference and cause a capital loss to permittees. Permit and/or base property values will fall. Though the effect on capital value will occur soon after the announcement of fee increases, out-of-pocket losses may not be incurred until the rancher sells his ranch or attempts to borrow money with ranch assets as collateral.

Heavy grazing cuts have already been made on the forests and are expected to continue. The BLM is almost certain to make cuts in the next few years. Range appraisers in the agencies claim the stocking rate is higher than renewable limits in many areas. In some cases ranchers have taken the initiative in reducing range use even before the agencies have required it, especially on some BLM ranges. In 1960 it was estimated by BLM personnel that 10 to 15 per cent of the permitted AUM's on BLM ranges in Utah were not used by ranchers. This doesn't necessarily mean the present forage isn't worth the fee. Rather, ranchers may be able to maximize the difference between fee and forage value over time by allowing the range to recuperate to a higher level of productivity.

Though the renewable limit for a given range may become stabilized at some high level, it seems certain the allowable limit for domestic livestock will decrease over time ($S_0$ in Fig. 1). The development of watersheds, the expansion of wilderness areas and national parks, the maintenance of big game herds, and measures for conserving natural resources will shift land use away from grazing. In addition, urban transportation and industrial developments will require more public land as time passes. These factors will accelerate the existing trend toward ranch consolidation and intensification.

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15 This information was given in conversation with the Utah BLM State Director at that time and supported with estimates made by BLM District managers in the state.
A loss of public range through permit cuts can have a much more telling effect on ranch income and wealth than a large per cent increase in fees. For example, a 20 per cent cut in permitted AUM's on a seasonal range for an average ranch with public grazing would require an 8.3 per cent reduction in herd size if the total rancher response was in herd reduction. Such a response would reduce ranch income on the average cattle ranch by about $1,300 and on the average sheep ranch by $3,000. Ranches just breaking even before a permit cut would be forced to reorganize immediately to compensate for income losses or to sell out. Selling out would be distasteful, however, because at least 20 per cent of rancher investment in permits plus considerable depreciation of base property values would have been lost.

As competing forage uses push stocking rates to lower levels, the value per AUM of public grazing may rise or fall. As we move back to a higher point on the demand curve in Fig. 1, each remaining AUM has a greater value providing the bundle can be economically used. If permit cuts continue, a point will ultimately be reached where it just doesn't pay to graze on the public range at all. Of course, what happens to the total permit value, that which remains after the cut in grazing will depend on the increase in value of the AUM's compared with the loss of AUM's that are cut. The crucial factor is the elasticity of the demand curve. The evidence suggests the curve is not perfectly elastic and that cuts in grazing are followed by slightly higher per AUM values, but much lower total permit values.

No concerted effort is being made at the present time to change base requirements and transfer restrictions, although we and others have suggested that this problem be examined. If no changes are made, resources will continue to be misallocated among rancher users. We think this is a rather critical problem and that policy changes that might be used to correct the situation should be discussed.

Misallocation of public forage within the livestock industry will remain as long as there are impediments to the transfer of permits and ranchers have little security of grazing tenure. Our proposal, set out in the next few paragraphs, should materially correct such misallocation.

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16 For detail see D. D. Caton et al., Economic Relationships . . . op. cit.
17 Ibid.
18 For a discussion of the importance of uncertainty in establishing permit values, as well as some empirical data see J. W. Milliman, "Capitalized Values and Misallocation in Grazing Public Range," Journal of Farm Economics, Vol. 43, No. 4, November, 1962. See also the reply by B. Delworth Gardner in the same issue of Journal of Farm Economics.
Existing permits should be converted into "rights" to graze a given number of AUM's on a given allotment for a certain season of use. Ranchers should be able to regard these rights as property and be free to buy and sell them as they wish. Present prerequisites for acquiring and holding permits such as priority, commensurability, and ownership of base properties and livestock, should be eliminated. Rights would be passed on to heirs as other property rights are. The only restriction would be that livestock of a specified kind must utilize the grazing. This restriction is necessary for range protection.

It may appear that the "right" proposal propounded here might interfere with agency management of forage resources and the allocation of resources among uses. We do not think so; in fact, our proposal should produce definite improvements over present practices. If the agencies wish to transfer resources to other uses they would simply move into the market and buy up sufficient rights to accomplish their purpose. As for resource protection, the ranchers themselves would find it in their best interests to preserve the productivity of the allotment and also invest in economic range improvements. In addition, the agencies could continue to make investments that appear to be necessary in multiple-use management, as they do at present.

How could the transition to this proposed system best be made? We believe the right should be issued to those who presently hold permits. As present permits expire the rights for the same number of AUM's could be issued in exchange. As range productivity increases, conceivably more grazing could be allowed than is covered by the current permit system. If so, the additional rights could be sold at auction to the highest bidder. If grazing must be diminished the agencies could purchase rights as earlier suggested. Some kind of third-party appraisal system might be necessary if the buyer and seller can't come to an agreement on a fair price.

Since the rights are unencumbered with eligibility qualifications and involve no risk of uncompensated grazing cuts, would windfalls be created by issuing rights to present permit holders? The answer is no, providing that the fee is "properly" set. The annual fee per AUM must be set below the market value of the forage. If the fee were set at the value of grazing, the right itself would have no value and could not be bought and sold by ranchers. If the fee were set near present levels, windfall gains would be created for the initial right recipients since the right is a much more substantial asset than is the present permit. It follows that at some fee higher than present fees, rights would be worth on the average exactly what permits are now. To avoid windfall gains and losses to stockmen as much as possible, the government should ascertain what this fee level would be and charge it. Thereafter the fee should vary with general price level movements so as to be constant in "real" terms. This would prevent fee changes that produce wealth losses and would enable ranchers to estimate how much they could afford to pay for rights.

This is the general idea of the proposal. Many details have been left
out in the interest of space. Expected results are impressive. The government would not obtain as much in fee receipts as the grazing is worth, although fees would be higher than at present. The agencies would have more revenues from grazing to use in improving and managing the public resources under their care. Ranchers would be equally as well off in terms of their wealth positions, but would pay higher fees. At the same time, however, they would have guaranteed tenure and protection against wealth losses.

Society's gains would be likewise impressive. A mechanism would be provided for transferring resources out of grazing without the political and legal turmoil that now exists. Ranchers would find it in their best interest to care for and improve public ranges as they do their own. Public forage would be allocated more efficiently among ranchers, and as a result society would benefit by realizing more product from its resources.

Many forces are in motion in the West that will tend to offset the deleterious effects of increased fees and reductions in public grazing. Ranch asset values in the West are being influenced by numerous and important factors. Population in the region is growing faster than the national average. Some areas are industrializing at a rapid pace. Non-agricultural uses of land and water resources are increasing. The probable result is higher land values. In most parts of the West the value of ranch base properties will probably increase more than enough to compensate for capital losses that would result from grazing fee increases and permit cuts.

If range type operations are to expand or even maintain the present share of a growing market for livestock products, management will have to become more intensive. Private grazing lands and public lands used for grazing can be made much more productive. These possibilities are so promising that we will present some of the details. Time and space will not permit complete coverage of the research available, however,

A study concluded in 1960 on improving meadow land in Nevada, involved four sets of improvement practices. When improvements consisted of leveling, draining, reseeding, fertilization, controlled irrigation, and well development, annual forage production increased almost 3.4 tons per acre with the return on the investment amounting to 18.5 per cent (with forage priced at $16 per ton). For meadow land improved as just described, except that no wells were developed, forage production increased about 2.3 tons per acre and when priced at $16 per ton returned 26.8 per cent on the investment. When improvements consisted of controlled irrigation, limited drainage, reseeding, fertilization, and partial leveling, forage production increased about 2 tons per acre and returned 46 per cent on the investment. When the only improvement practice was to change from wild flooding to controlled irrigation, forage yields increased about 0.58 tons per acre.

and returned nearly 293 per cent on the investment.

These data from operating ranches suggest that returns to capital investment increased rapidly at first but eventually at a decreasing rate as expenditures increased on a given ranch. The return to improvement capital, however, in each alternative studied was far above the market rate of interest for money, indicating a profitable venture.

Unfortunately, many ranchers do not have meadow land of the type studied in Nevada. How can other types of privately-owned range land be adapted to more intensive management? The Utah Agricultural Experiment Station has published some information on reseeding. Ranges in western Utah with a carrying capacity of approximately 10 acres per AUM were reseeded with crested wheatgrass. The carrying capacity for seeded areas studied rose to an average of 3.8 acres per AUM. Yearling steer and heifer gains on unseeded ranges averaged 1.2 pounds per day, but were nearly 2 pounds per day on seeded range. Instead of 10 AUM's of forage on 100 acres a rancher could obtain slightly more than 26 AUM's of forage yielding considerably more marketable product. One hundred acres of improved private range could replace 16 AUM's formerly obtained from unimproved public range during the season. If necessary, such an adjustment could compensate for the loss of about 160 acres of public range land.

A recent study of northwestern Colorado ranches indicated that, on the average, reseeding returned 15 per cent on investment, sagebrush spraying 9.5 per cent, sagebrush beating 4.8 per cent. However, these rates do not reveal the profitability of these practices to the rancher. The U.S. Department of Agriculture is paying about 50 per cent of the total cost of these "conservation" practices. This means that the rates of return to the rancher's share of the cost are about twice those reported.

It must be remembered that these research results are of very recent origin, most of them in the last five years. Ranchers haven't begun to exploit potentials for profitable improvements. Because the returns are so impressive, however, and because ranchers are being squeezed by shortages of range forage, it seems certain that range improvements will increase tremendously in the next decade, especially if the government maintains its conservation program with large ACP payments. In our opinion, these sources of increased forage will more than offset losses on the public range. The cattle industry is not likely to reduce numbers of range livestock in years ahead. The sheep industry has other problems, such as foreign competition, that dwarf in importance such things as public

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range policy, so its future is much more problematical.

The possibilities for internal ranch management improvements may further forestall decreases in numbers of cattle in the West. Operations may shift from the basic cow-calf type, largely dependent on range, to farm herds and feeder type activities. The rapid expansion of population in the West assures an expanding market for finished animals, and more feeders may remain in the area rather than move to the Midwest.

Of course, much depends on the general health of the cattle industry. Over the long pull most signposts seem to point to a favorable economic climate for cattle. Increased consumption of beef per capita, an expanding population, high income elasticities for beef, rising personal incomes, better transportation, etc., all substantiate an optimistic forecast. With respect to the range livestock industry in the West, our conclusion is that the relative cost of producing cattle will not rise perceptibly as a result of anticipated public range policy. Too many favorable offsetting factors exist. If other sections of the country are planning to replace western feeder cattle in the feeder markets around the country, they will have to be prepared to produce at lower cost. Western stockmen seem reasonably well equipped to maintain their present position, at the very least.