ADJUSTMENTS IN GRAZING USE

AN EVALUATION OF ADJUSTMENTS IN GRAZING USE AS THEY OCCUR IN THE MANAGEMENT OF THE FEDERAL RANGE BY THE BUREAU OF LAND MANAGEMENT

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ABSTRACT

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Bureau of Land Management responsibility for manggement of the national land reserve is spelled out in the Taylor Grazing Act. The objective is to provide for orderly use, improvement and development of public grazing lands, to prevent overgrazing and soil deterioration, and to stabilize the range livestock industry.

Early in the administration of the Taylor Grazing Act the grazing capacity of the range was commonly over-obligated. By July 1961, 1,039 grazing units had been adjudicated, to bring permitted use in line with grazing capacity, and the remaining 750 units are scheduled to be adjudicated by July 1967.

Adjudication is not an end in itself but only a starting point from which sound range management can proceed. Where the range is over-obligated, adjudication means that ranchers must give up some of their licensed grazing privileges. Range use is licensed in terms of Animal Unit Months (AUM's) of grazing. This is a 2-dimensional concept of both number of animals and time on the range. Permit reductions are in terms of AUM's and are commonly worked out partly in numbers of animals permitted on the range and partly in length of grazing period. This allows some flexibility of adjustment--to the benefit of both the permittee and the range resource. Time reductions usually involve periods when the range is easily damaged by livestock and when livestock do not produce well for lack of nutritious feed. The reduction in AUM's of permitted use is not necessarily reflected as a proportionate reduction in the rancher's basic breeding herd. The percentage reduction in permitted use is often misleading since it is common for unadjudicated privileges to include some AUM's not actually used by the rancher; the reduction in actual use of the Federal range is often less severe than the reduction in permitted use.

Most permits to graze the Federal range are held by persons who do not earn the major part of their livelihood from range livestock. A small permit is not synonymous with a small ranch.

Most permits for cattle are smaller than the estimated break-even size of cattle ranches. Commonly full-time farmers in irrigated areas use the Federal range for a supplementary or complementary range cattle enterprise. BLM permittee statistics for the period 1950-1960 in Idaho, Oregon, and for all BLM grazing districts do not indicate ranch failures attributable to BLM administrative actions.

In the 10 States in which there are grazing districts, from 4 to 79 percent of the cattle population was permitted on the Federal range in 1960. In 5 of the 10 States this percentage varied from 19 to 36. Specific localities are more dependent on the national land reserve than State average data indicate. Data for the intermountain ranching area include 39 percent of all cattle permits and 51 percent of permitted use by cattle on all BLM grazing districts. These data indicate that the Federal range supplies an average of 34 percent of the total annual feed supply of ranches holding BLM permits.

Examination of records of actual adjudication of the Soldier Creek Unit, Vale Grazing District, and the Junction and Artesian Units of the Burley Grazing District revealed no evidence that adjudication has resulted in forcing ranchers out of business. The record indicates that 36 of 37 permittees in the Soldier Creek Unit in 1952, before adjudication, were still in business in December 1961. The one ranch no longer operating did not go out of business due to adjudication. Similar situations were found in the Artesian and Junction Units. In all those units ranchers with small and medium-sized ranches have made successful adjustments. Some ranches have been enlarged, most have been reorganized, and some grazing reductions have been restored. In these units, as in most throughout the BLM, a major problem has been the lack of adequate and timely funds with which to implement range improvement and development projects coordinated with adjudications.

The economic impact of range adjudication on ranch firms was studied through the use of three ranch budgets representing small-sized cattle ranches in Idaho and Oregon. One model for each State was based on common ("average") ranch management practices and output levels. The third model (Idaho) represented attainable "good" management practices and resulting output levels. Indications are that there is often opportunity for improved ranch income through improvement of ranch organization and management. Application of typical grazing privilege reductions to the two models of average-

management, small-sized ranches was tested. Alternative courses of action open to ranches affected by adjudication were studied. It was concluded that adjudication does affect ranchers financially by forcing them to obtain more expensive alternative feeds. Ranchers whose range privileges are reduced need additional investment capital, working capital, and time for successful adjustment. It may often be necessary to increase land ownership, improve owned land, and improve livestock management practices. Impacts of adjudication were found to be less severe than those of price fluctuations common in the cattle market. It was concluded that range adjudication is rarely a primary cause of ranch failure.

Ranchers have available the following Government programs that may assist adjustment to reduced privileges: (a) BLM cooperation in planning range adjustments to minimize adverse effects on ranches. (b) BLM regulations permitting up to 3 years in which to adjust to a reduction. (c) The Agricultural Conservation Program for cost-sharing of conservation practices on private lands. (d) Services of the Soil Conservation Service. (e) Government-fostered cooperative credit agencies (Production Credit Associations and Federal Land Banks). (f) The lending services of the Farmers Home Administration.

BLM range survey and study techniques are based on research findings of correlations between vegetation and soil conditions and environmental influences including intensity of grazing. Surveys and studies are designed to rate ranges for maximum sustained use by livestock and game; this use will maintain ranges in a good productive condition. The ultimate test of surveys, and grazing capacities based on them, is trend in range condition. Capacity estimates based on surveys have current validity only and are properly used only as a starting point in management. Permissible grazing rates will vary with changes in range condition due to changes in weather or intensity of use. Continuous studies are necessary to follow up a survey and adjust initially established grazing capacities. A number of experimental and demonstration areas in the west demonstrate the need for moderate grazing rates if optimum range condition and livestock production are to be approached over time. Heavy use has invariably resulted in reduced production of both vegetation and livestock. Acceptance of range survey and study results requires acquaintance with the evaluation techniques and the benefits resulting from their application. This is best obtained by actual participation in the process or observation of results where effectively applied. BLM survey and condition-and-trend

study procedures have recently been critically reviewed and evaluated. Detailed reports on these analyses are on file in the Office of the Director. BLM surveys and studies are technically sound.

Management of cheatgrass ranges is difficult because the grass produces forage that is useful during only a very short season and that varies greatly from year to year. Management objectives vary among ranges as some can be converted back to more productive and reliable grasses through management while others cannot. Proper use of a cheatgrass range requires flexible management to allow for annual variations, and the initial stocking commitment must be conservative to avoid serious problems in poor years.

The impact of adjudication on ranches, as revealed by actual cases and examination of economic models, suggests several alternative courses of action open to the BLM. The basic problem is a conflict between immediate rancher welfare and the BLM's statutory objective of long-run range conservation and long-run rancher welfare. Examination of nine major alternative ways of minimizing the conflict led to the following recommendation:

The BLM should (a) seek more adequate and timely financing of its range management programs, (b) better integrate its present range management activities, (c) study the possibility of recommending a broadening of existing FHA and ACP programs in the Department of Agriculture to provide capital needed by ranchers adjusting to range adjudication, and (d) consider establishment of a privately financed, federally guaranteed, conservation loan system as an alternative to expansion of FHA.

AN EVALUATION OF ADJUSTMENTS IN GRAZING USE AS THEY OCCUR IN THE MANAGEMENT OF THE FEDERAL RANGE BY THE BUREAU OF LAND MANAGEMENT

Proper management of the national land reserve (vacant, unappropriated, and unreserved public domain) is required by the provisions of the Taylor Grazing Act, as amended, and supplemented.

The preamble to the act states: "An act to stop injury to the public grazing lands by preventing overgrazing and soil deterioration, to provide for their orderly use, improvement, and development, to stabilize the livestock industry dependent upon the public range and for other purposes." Section 2 requires the Secretary of the Interior to make provisions for the protection, administration, regulation, and improvement of the public land.

The act clearly prohibits use or practices that result in overgrazing, injury, or deterioration of the public land. Pursuant to the act, the Federal Range Code for Grazing Districts provides regulations required to meet the management objectives for the grazing resource. Section 161.6(e)(3) of the Federal Range Code prohibits the issuance of licenses or permits that confer grazing privileges allowing use to be made of the range in excess of the grazing capacity except for overuse that might occur during a maximum three-year period while graduated reductions in grazing use are being applied.

The Bureau of Land Management is required to adjust base property qualifications and permitted use to whatever extent is necessary to prevent overgrazing, soil deterioration, and injury to the Federal range. Range depletion must also be curbed in order to help stabilize the dependent livestock industry.

The necessity for major adjustments in base property qualifications for use of the Federal range at this time stems primarily from the initial determination of base property qualifications to use the Federal range as provided by the preference provisions of the Federal Range Code when the grazing districts were established. The dependency by use or priority of base property was determined on the basis of the use that the applicant made of the Federal range for any two consecutive years or any three years of the base period--1929 to 1934 in most cases--and the commensurability (production rating) of the base property. There was a tendency at that time to be liberal in the application of the regulations and to give an applicant the benefit of the doubt with regard to preference or priority claims. These practices often resulted in a pyramiding of preferences on the same range and recognition of base property qualifications substantially in

excess of the grazing capacity of the Federal range. These over-obligations were recognized early in the administration of grazing districts, and it was commonly understood that adjustments would be made as early and as rapidly as personnel were made available to obtain reliable basic data on range and ranch production as a basis for equitable apportionment of the Federal range among competing applicants. Efforts to accomplish this important work were thwarted by scarcity of personnel, program cutbacks, and the advent of World War II. The adjudication program was not reactivated until 1950 (16 years after passage of the act), but it has been given priority in the Bureau's program since that time. The 59 grazing districts in ten western States have been divided into 1,789 administrative grazing units. Up to July 1, 1961, 1,039 of these had been adjudicated and the permitted grazing use equitably adjusted to the grazing capacity of the Federal range. Adjudication and adjustment of grazing privileges in the remaining 750 grazing units is scheduled to be accomplished by July 1, 1967.

Continued recognition of base property qualifications in excess of the grazing capacity of available Federal range has resulted in much misunderstanding concerning recognized base property qualifications, annual licenses, actual use, and range potentials. The result has been inflated property values, improper management, overgrazing of the Federal range, continued deterioration of the range, and failure to stabilize the dependent livestock industry on a sound basis.

The Bureau of Land Management Approach to Range Management

For a number of years following the initiation of administration on the Federal range, little actual management of the range was imposed directly by the Bureau. The limited manpower available was fully occupied in determination of qualifications for use of the range, issuance of licenses and permits, and limited trespass control. Where all the stockmen using a particular range were inclined to conserve the resource, ranges generally improved, but continued overuse of the remaining ranges has continued range deterioration, or has prevented improvement.

It is of utmost importance that trends toward soil and vegetation deterioration be reversed. This is a paramount objective of the Bureau's present program of range management. To accomplish this objective a detailed inventory (range survey) of the resources within each administrative area is made, the extent of qualifications for grazing privileges are determined, and necessary plans for further management action are developed.

The management plan, guided by the findings of a resource inventory and the extent of the base property qualifications, sets forth the reductions, if any, required and the manner in which they will be imposed; indicates allotments that will be made; identifies range development and rehabilitation work needed; specifies management systems; and provides for studies and evaluations needed to guide future actions.

Range adjudication includes that portion of the overall management program encompassed by determination of base property qualifications and equitable apportionment of available forage among the applicants, during the proper season, and within the grazing capacity of the Federal range. It is at this point that reductions in grazing use often must be imposed. Completion of adjudication provides a base for a sound management program; it is not an end in itself but serves only as a starting point from which a sound program of management and rehabilitation can proceed.

Adjustments resulting in major reductions usually involve authorized use of the range that is not actually made. Depleted ranges generally are not used with the full numbers of stock during the early part of the grazing season; most stockmen turn out dry stock first and hold "calvy" cows and stock in poor condition until forage growth is fairly well along. As the season progresses and forage is heavily utilized, most stockmen remove their animals from the range as soon as they drift to the ranch properties. This drift from a spring-summer-fall range often begins by midsummer, so that by early fall most of the cattle are off the range. In addition, some permittees and licensees carry a portion of their grazing privilege on a nonuse basis since the range will not support the full obligation. Downward adjustments of permits are made in a manner that will have the least adverse effect on the financial position of the livestock operation and still meet the needs of the resource. Consequently, the adjustment usually involves both time of use of the Federal range and numbers of livestock on the Federal range. The result is a much smaller reduction in livestock numbers than is implied by the overall reduction in animal unit months (AUM's) of use. The reduction in numbers of livestock that use the Federal range is not necessarily reflected as a proportionate reduction in the basic breeding herd.

Provisions for range development and rehabilitation are an essential part of the management plans. Most Federal ranges requiring reduced use possess potentials for substantial

improvement in forage production. Rehabilitation projects must be adequately protected to establish new seedings and to respond to other treatment. Reduced use is prerequisite to large-scale range development and rehabilitation programs. In some cases range rehabilitation has resulted in restoration of significant amounts of reductions in permits previously imposed. In some units the entire amounts of heavy reductions have been restored within a five-year period, as a result of forage increases from range seeding projects.

As more intensive management of the range becomes possible, systems of management are applied that will increase the sustained yield of range forage. Frequently ranges are divided to separate the various portions on the basis of proper season-of-use or with differing dates of range readiness. Also systems of deferred-rotation, and rest-rotation grazing are often beneficial.

Since a range is a dynamic plant community, continuous studies are needed to guide management actions. The management plan specifies, by type of study and location within the allotment, studies required to meet both immediate and long-range needs. Such information will provide the bases for future allocation of increases or imposition of reductions as the case may be.

A case example of a BLM management plan is provided by that developed for the Mahogany Unit of the Vale Grazing District in Oregon. (See Figure 1.) In preparing the management plan for the Mahogany Unit, four major factors were considered:

1. Seasonal use capabilities of the range

2. Similarity of ranch operations and location of operators

3. Estimated grazing capacity of the range

4. Integration of the rehabilitation and development program with the proposed management plan.

Typical problems of too-early use of the range, because of the need to get livestock off hay meadows, too-intense use and prolonged use of one area during the critical time of grass seed formation were prevalent in this unit. All areas accessible from water are in a deteriorated condition.

In preparing the management plan the unit was divided into four group allotments which conform, as nearly as practicable, to areas of customary use. Each allotment will be further divided into seasonal-use areas whereby spring-fall ranges will be segregated from summer ranges.

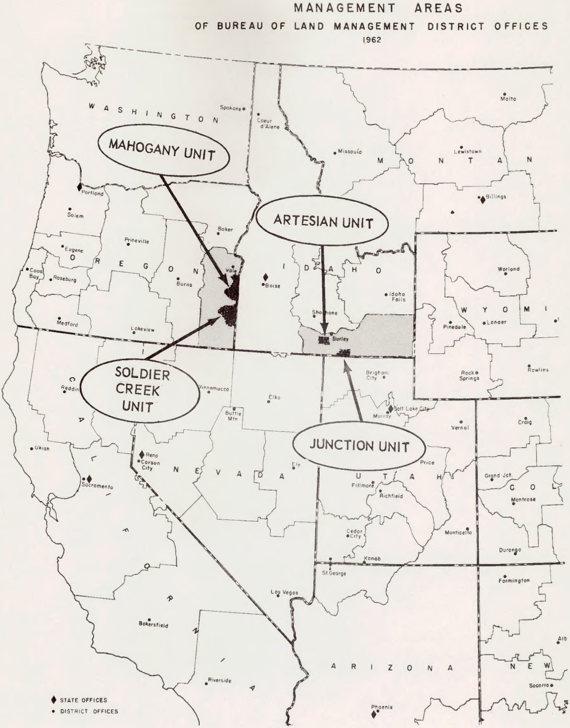

FIGURE 1. LOCATION OF SPECIFIC UNITS IN THE VALE AND BURLEY GRAZING DISTRICTS

Seeding and sagebrush control projects are located within the allotments to provide opportunity for rotating use in both spring-fall and summer areas.

The management program will require improved livestock management as well as improved management of the range. It will require ranchers to exercise greater care and control of livestock on the range than ever before. For this reason some permittees are resisting the change However, the more progressive operators are cooperating.

Customary practice has been to make one roundup of beef and dry cows in mid-summer and to make another large roundup, in the fall, of stock that did not drift home by themselves.

We expect that the rehabilitation and development program will result in a 20 to 50 percent increase in total grazing capacity within 2 or 3 years. The management program alone should effect a 15 to 30 percent improvement in grazing capacity within 5 years, depending on the allotment.

A case example of a range rehabilitation and development aspect of a management plan is provided by that developed for the Soldier Creek Unit of the Vale District in Oregon. (See Figure 1.)

The Soldier Creek Unit has suffered many years of overobligation, overuse, unseasonal use and promiscuous water development. After adjudication of the unit in 1956, the Bureau of Land Management prepared a range rehabilitation program for the Soldier Creek Unit. Lack of funds prevented timely implementation of the plan. By 1961 the unit was divided into four group allotments. The allotments are not yet all fenced. It is necessary to complete water development and land treatment projects before it will be feasible to complete the fencing. Each allotment will then be self-sustaining with enough seeded pasture to permit a needed plan of rotation grazing. Such a system of management will result in use and protection of both the seeded areas and the native range.

Sizes of Federal Range Permits

Data indicate that most holders of permits to graze cattle on the Federal range have relatively small herds. Many undoubtedly have other sources of income, either farm or nonfarm.

Nearly half (47 percent) of all cattle permits issued on BLM districts in 1960 were for 50 or fewer animals. (See Table 1 and Figure 2.)

Research indicates that to be economically successful intermountain cattle ranches need about 200 or more cattle. Smaller ranches generally tend to return insufficient net ranch income. Using 200 cattle at a breaking point, indications are that in all BLM districts 82 percent of the permittees have less than an economic range cattle operation. These 82 percent of all permittees own only 32 percent of the cattle that graze the Federal range. In Oregon (Table 2 and Figure 3) one-third of all cattle permits are for 50 head or less, and 70 percent of the permittees have 200 or fewer cattle and only 24 percent of the permitted cattle.

In Idaho (Table 3 and Figure 4) 44 percent of the cattle permits are for 50 head or less, and 85 percent are for 200 or fewer animals. These 85 percent of the stockmen own only 46 percent of the cattle on the range. Thus, in Oregon, Idaho, and throughout the West, most BLM permits issued to cattlemen are used as part of livestock enterprises which are complementary or supplementary to general farming in the irrigated valleys. Such permittees have a wider range of adjustment alternatives and opportunities than do cattlemen whose sole, or primary, source of income is range cattle. Therefore, this report is concerned mostly with "small" range cattle ranches of about 200 cow-units having cattle as the primary enterprise, and not with holders of small-sized BLM range permits

Table 1. Size-class distribution of grazing permits and licenses issued on all BLM grazing districts, 1950 and 1960

Cattle and Horses

Size of Permit (No. of Head)	No. of Head				No. of Permittees			
	1950	%	1960	%	1950	%	1960	%
50 or less	175,784	7	150,750	7	6,955	43	7,177	47
51 to 100	238,268	10	213,248	10	3,201	20	2,878	19
101 to 200	386,211	16	350,832	15	2,697	17	2,386	16
201 to 500	656,899	27	620,819	27	2,273	14	1,985	13
501 to 1,000	408,262	16	415,951	18	698	4	592	4
over 1,000	592,965	24	527,650	23	405	2	237	1
Total	2,458,389	100	2,278,250	100	16,229	100	15,255	100

Table 2. Size-class distribution of grazing permits and licenses issued on BLM grazing districts in Oregon, 1950 and 1960.

Cattle and Horses

Size of Permit (No. of Head)	No. of Head				No. of Permittees			
	1950	%	1960	%	1950	%	1960	%
50 or less	11,975	4	7,837	3	458	35	341	33
51 to 100	18,027	7	14,196	6	228	17	177	17
101 to 200	37,262	14	32,430	14	258	19	210	20
201 to 500	68,671	26	70,210	30	223	17	213	19
501 to 1,000	67,648	25	61,884	27	104	8	91	9
over 1,000	64,818	24	47,493	20	50	4	26	2
Total	268,401	100	234,050	100	1,321	100	1,058	100

Table 3. Size-class distribution of grazing permits and licenses issued on BLM grazing districts in Idaho, 1950 and 1960.

Cattle and Horses

Size of permit (No. of Head)	No. of Head				No. of Permittees			
	1950	%	1960	%	1950	%	1960	%
50 or less	33,467	13	24,656	11	1,188	49	855	44
51 to 100	38,321	15	32,108	13	513	21	425	22
101 to 200	54,068	21	51,487	22	383	16	352	19
201 to 500	71,888	28	72,393	30	246	10	235	12
501 to 1,000	31,409	12	28,639	12	62	3	40	2
over 1,000	28,044	11	29,675	12	38	1	16	1
Total	257,197	100	238,958	100	2,430	100	1,923	100

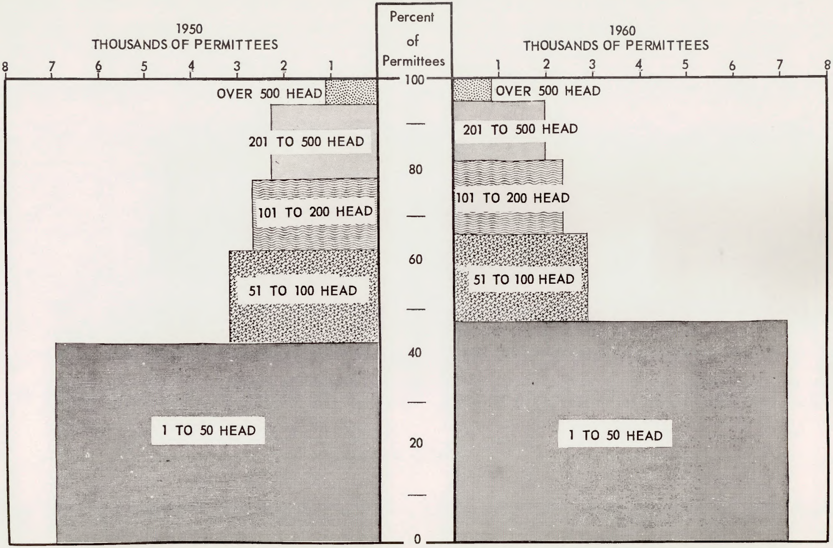

FIGURE 2. NUMBER OF PERMITTEES, CATTLE AND HORSES, TOTAL, ALL DISTRICTS, 1950 AND 1960

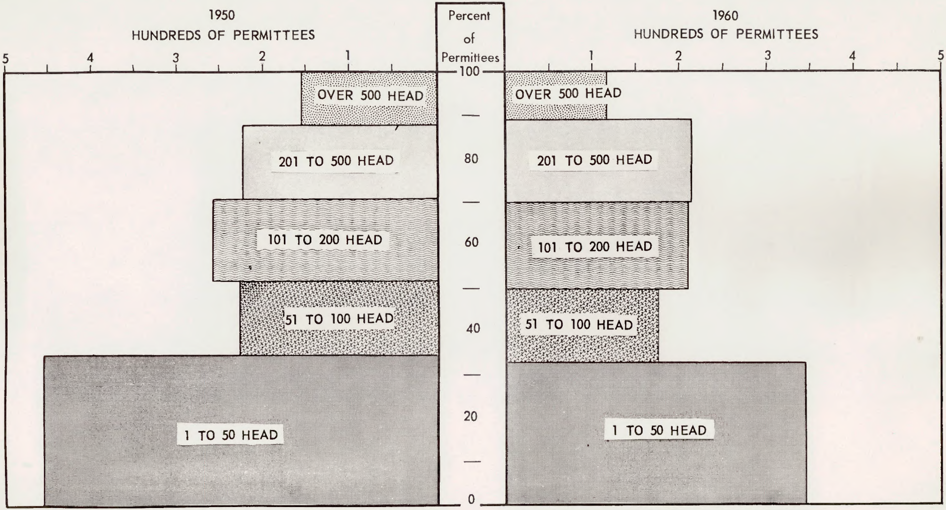

FIGURE 3. NUMBER OF PERMITTEES, CATTLE AND HORSES, TOTAL, DISTRICTS IN OREGON, 1950 AND 1960

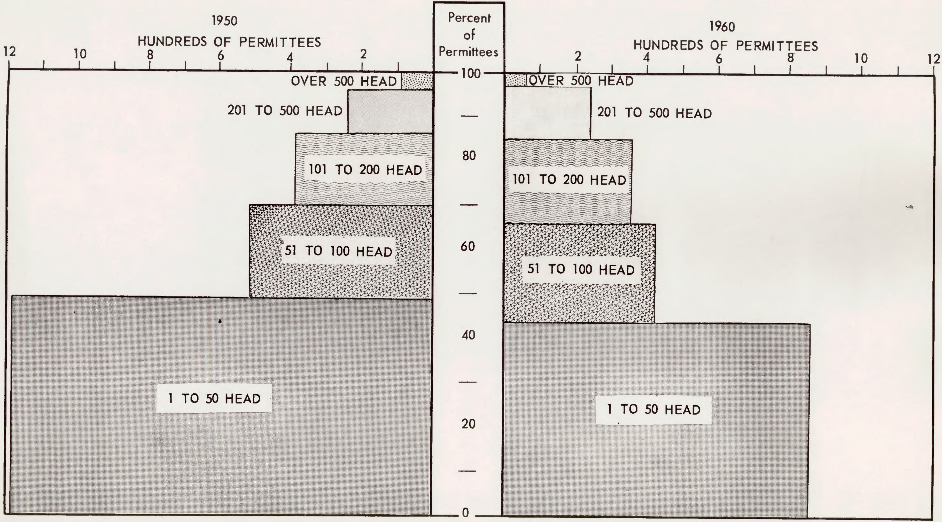

FIGURE 4. NUMBER OF PERMITTEES, CATTLE AND HORSES, TOTAL, DISTRICTS IN IDAHO, 1950 AND 1960.

The Vale Grazing District in Oregon (Figure 1.) is mostly true range cattle country; there are relatively few small permits there; most stockmen earn their livelihood from range cattle. Some examples are:

Rancher VA - Has a permit for only 43 head in the Soldier Creek Unit, but runs 175 head in neighboring Jackie's Butte Unit. He is a full-time rancher.

Rancher VB - Is permitted 180 animals and 734 AUM's on the Soldier Creek Unit. This is a full-time ranch run with family labor.

Rancher VC - Has 170 animal units and uses 537 AUM's of Federal range in the Mahogany Unit. This is a full-time family outfit. He commonly exchanges haying labor with neighbors. He has surplus hay which is sometimes fed to purchased stock. Surplus hayland can be converted to pasture if need be.

The Burley Grazing District in Idaho (Figure 1) is more closely related to irrigated croplands than is the Vale District. Consequently there are proportionately fewer full-time ranchers and more permittees who use Federal range to supplement other farm income sources. Some examples of how BLM permits on the Burley District fit into the local economy are as follows:

Rancher BA - Owns 41 cattle; 22 are permitted on the Federal range for 171 AUM's. This permittee has put most of his own land in the Soil Bank. He sells Christmas trees that he cuts off his own and BLM lands. In the spring he does custom work for neighbors. During the summer he works in Montana.

Rancher BB - Owns 60 cattle; 10 are permitted on the Junction Unit for a total of 40 AUM's. His is a purebred operation. His stock graze mostly his own property. His BLM permit is used only for dry stock.

Rancher BC - Owns 115 head of cattle. He has a permit for 62 AU's and 288 AUM's. He also uses national forest land with 15 cattle. During the summer he is employed full-time as a cadastral survey crew member by the Bureau of Land Management. During early winter he cuts and sells Christmas trees.

Rancher BD - Owns 155 cattle. He has a permit for 95 AU's and 102 AUM's. He uses national forest grazing for 54 AU's and 192 AUM's. He is a small, full-time, family operation.

Rancher BE - Owns 250 cattle. He has a BLM permit for 30 AU's and 10 AUM's. On the national forest he is permitted 186 AU's and 560 AUM's. His is a full-time family-operated ranch employing some extra labor.

Rancher BF - Owns 180 cattle. His cattle use the Federal range on their way to the national forest; his BLM permit is for 180 AU's and 162 AUM's. This use is mostly on a crested wheatgrass seeding. Due to improved capacity of the seeded area, his BLM permit was increased by 61 AUM's (61%) in 1960. He contributed 50 percent of cost of seeding his share of the 900 acre area. Even though his range cattle operation approaches the size of a full-time economic unit, this rancher's cattle are only part of his farm business. He is basically a row-crop farmer producing potatoes, beans, beets, and alfalfa on 220 acres of irrigated land.

If the charge that BLM range adjudications are driving small ranchers out of business were true, we would expect to find evidence of this in permittee statistics. Most BLM adjudications (unduly delayed many years) have been accomplished since 1950. The statistics (Tables 1, 2, and 3; Figures 2, 3, and 4) indicate that between 1950 and 1960 the percentage distribution of permits in the small and medium-sized ranch classes was quite stable. The smallest permits did decline in Oregon (down from 35% to 33%) and Idaho (from 49% to 44%) but increased in all BLM districts (up from 43% to 47%), but larger permits (for small and medium-sized ranches) changed very little in percentage distribution among size classes.

By the end of fiscal year (FY) 1960, only 18 percent of the permits in Oregon had been adjudicated and 53 percent of the job was done in Idaho. By the end of FY 1961 adjudication accomplishments had risen to 25 percent and 57 percent respectively for Idaho and Oregon. Nationally, 58 percent of the adjudication job had been completed by the end of the 1961 fiscal year.

In Oregon there were 20 percent fewer cattle permittees (-263) in 1960 than in 1950. In Idaho the number dropped by 507, a 21 percent decrease. There were corresponding declines in numbers of permittees in most of the permit size classes in these States. These drops in numbers of permits issued represent the net result of ranch sales, purchases, and consolidations.

Western stockmen are a small part of American agriculture. (Only about 0.4 percent of all farmers in the United States have BLM range permits.) For many years American farms in general have been becoming fewer, larger, and more efficient. The same forces affect ranches. What may have been a satisfactory economic unit when the Taylor Grazing Act was passed is now too small and perhaps not adequately efficient. Thus there are many ranchers who go out of business to retire or to take advantage of a profitable sale offer; their units are often consolidated with others. There is also a speculative trend in western ranch land transactions that has lured many ranchers out of business with high land prices. Thus there are many forces at work, not related to BLM administrative activities, that cause small ranchers to get out of ranching. For American agriculture as a whole, farm population declined by 15-1/2 percent between 1950 and 1959. During the same period the number of farms in the United States dropped by 18 percent. By comparison the Oregon and Idaho range cattle permit declines of 20 and 21 percent do not seem unusual; they are in line with national trends in agriculture. Although BLM adjudications may have been a contributing factor to some ranchers' decisions to quit the business, there is no evidence here that adjudications have been a primary cause of ranch business failure.

Dependency of ranches on BLM grazing permits

Size of permit held by a rancher is only a rough indicator of size of ranch business. Some economic-sized ranches hold small permits in one or more grazing districts. The question arises, "How dependent on the Federal range are cattle ranchers?"

One crude indicator of dependency on the national land reserve is the proportion of all cattle permitted on the Federal range. (See table 4). Based on all cattle and calves, except milk cows, in the State and all cattle in Oregon there were 20 percent fewer cattle permittees (-20%) in 1960 than in 1950. In Idaho the number dropped by 507, a 21 percent decrease. There were corresponding declines in numbers of permittees in most of the permit size classes in these States. These drops in numbers of permits issued represent the net result of ranch sales, purchases, and consolidations.

Western stockmen are a small part of American agriculture. (Only about .4 percent of all farmers in the United States have BLM range permits.) For many years American farms in general have been becoming fewer, larger, and more efficient. The same forces affect ranches. What may have been a satisfactory economic unit when the Taylor Grazing Act was passed is now too small and perhaps not adequately efficient. Thus there are many ranchers who go out of business to retire or to take advantage of a profitable sale offer; their units are often consolidated with others. There is also a speculative trend in western ranch land transactions that has lured many ranchers out of business at high land prices. Thus there are many forces at work, not related to BLM administrative activities, that cause small ranchers to get out of ranching. For American agriculture as a whole, farm population declined by 15-1/2 percent between 1950 and 1959. During the same period the number of farms in the United States dropped by 18 percent. By comparison the Oregon and Idaho range cattle permit declines of 20 and 21 percent do not seem unusual; they are in line with national trends in agriculture. Although BLM adjudications may have been a contributing factor to some ranchers' decisions to quit the business, there is no evidence here that adjudications have been a primary cause of ranch business failure.

Dependency of ranches on BLM grazing permits

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One crude indicator of dependency on the national land reserve is the proportion of all cattle permitted on the Federal range. (See table 4). Based on all cattle and calves, except milk cows, in the State and all cattle permitted on the Federal range in that State, dependency for the 10 western states varies from a low of 4 percent to a high of 79 percent. Although a rough measure, data in Table 4 do indicate the relative importance of BLM grazing permits to the cattle industries of the various States. Generally, the smaller the total cattle industry, the more dependent it is on Federal range. Nevada, Utah, and New Mexico are examples. Arizona seems to be an exception. The States (California, Colorado, and Montana) with much good range and a high proportion of privately-owned lands are least dependent.

Percentages in Table 4 are probably biased downward as State cattle populations include calves while BLM permit data do not account for animals under six months of age.

Table 4. Estimated proportion of all cattle that use the Federal range, 10 Western States, 1959-60.

State	Cattle Population 1/	Cattle Permitted on the Federal Range 2/	Proportion of Cattle Using Federal Range
	(Number)	(Number)	(Percent)
Nevada	517,398	407,223	79
Utah	609,814	218,800	36
New Mexico	1,042,095	268,021	26
Idaho	1,185,965	273,056	23
Oregon	1,201,979	248,666	21
Wyoming	1,224,324	229,549	19
Montana	2,385,114	392,940	16
Arizona	958,290	121,426	13
Colorado	2,079,458	191,206	9
California	2,962,956 3/	105,020	4

1/ As reported in the 1959 Census of Agriculture. Number of cattle and calves minus number of milk cows, in October-November 1959.

2/ As licensed by the BLM in 1960.

3/ Datum from 1954 Census of Agriculture.

State averages, as in Table 4, fail to show the variety of circumstances within each State. Some localities make practically no use of Federal range while BLM permits are very important to the local economies of other areas. Table 5 shows the estimated percentage of all cattle (except milk cows) permitted on BLM ranges for three selected ranching areas. The Elko, Nevada, area is commonly considered true "cow country." The Vale grazing district is similar to northern Nevada, but it has more irrigated farms. The Salmon grazing district lies contiguous with national forest lands; many ranchers use the national forest and not the Federal range. These three situations were selected as they permit comparison of total cattle populations and BLM grazing permit data. The boundaries of the counties and the grazing districts are nearly the same; in very case, however, the grazing district is slightly larger than the counties. Due to this and the fact that grazing permits are often written for cattle from outside the district, percent dependency is biased upward. However, this upward bias may be more than compensated for by the fact that cattle population statistics include calves while BLM permit statistics do not.

Table 5. Estimated proportion of all cattle using the Federal range, selected areas, 1959-60

[1]Cattle Population, 1959		Cattle Permitted on Federal Range, 1960		Proportion of Cattle Using - Federal Range [2]
	(Number)		(Number)	(Percent)
Malhuer Co., Ore.	139,878	Vale District	98,795	71
Elko Co., Nev.	150,599	Elko District	141,079	94
Lemni & Custer Co., Ida.	80,718	Salmon District	39,562	49

A better view of the dependence situation is found in Table 6. Here data summarized from the files of 31 of BLM's 59 district offices are used. In this case number of cattle owned is as stated on the cattleman's application for a grazing permit, and permitted use of the Federal range is recorded from permits actually issued.

[1] As reported in the 1959 Census of Agriculture. Number of cattle and calves minus number of milk cows.

[2] In each of these three cases, the grazing district is somewhat larger than the county; also, cattle may be permitted from adjoining areas not reported in the census. Therefore, these percentages are biased upward.

Table 6. Permitted Use of The Federal Range by Cattle, Intermountain Ranching Area, 1960

Permittees (Number)	Cattle Owned (Number)	Total Annual Feed Requirements 1/ (AUM's)	Permitted Seasons of Use of Federal Range	Permitted Use Federal Range (AUM's)	Proportion Total Annual Feed Obtained from Federal Range 2/ (Percentage)
3,035	777,484	9,329,808	Spring-Summer-Fall	2,618,544	28
811	300,247	3,602,964	Spring-Summer-Fall-Winter	1,771,846	49
684	88,909	1,066,908	Fall-Winter-Spring	375,055	35
262	45,254	543,048	Winter	147,424	27
187	35,157	421,884	Winter-Spring	142,280	34
169	30,111	361,332	Spring-Summer	103,060	29
115	14,791	177,492	Fall-Winter	68,469	39
8	6,109	73,308	Summer	24,380	33
11	1,400	16,800	Spring	1,318	8
Total 5,282	1,299,462	15,593,544		5,252,376	XX
Average XX	246	2,952		994	34

1/ (No. of cattle owned) X (12 months)

2/ $\frac{\text{(AUM's of permitted use)}}{\text{(AUM's annual requirement)}} \times 100$

Data in Table 6 represent 39 percent of all cattle permits issued by the BLM in 1960, and they include 51 percent of all permitted use (AUM's) by cattle in 1960. The data are for the Intermountain area (Figure 5) which includes parts of 7 of the 10 western States containing grazing districts. For the entire area, an average of 34 percent of the annual feed supply is obtained from BLM ranges. This varies among ranches and with the particular seasons the cattle are on the national land reserve. Those on Federal range all four seasons obtain an average 49 percent of their feed from the BLM. Eleven ranches use BLM lands only in the spring and get only 8 percent of their feed by permit. Many of these ranchers also use national forest grazing in the summers. The most common situation (both modal and average) is for cattle ranches to obtain about 1/3 of the year's feed supply from the Federal range.

Actual cases of adjudication of BLM range units.

A. Vale Grazing District, Oregon (See Figure 1)

1. Soldier Creek Unit

(a) Sequence of events:

The 265,000 acres of Federal range in this unit were covered by a range survey in 1951 and 1952. The survey showed that the 37 livestock operators were faced with a reduction in permitted use of approximately 40 percent. In 1953 the season of use was reduced from 7 months to 5 months. This still left a 29 percent reduction to be imposed since not all of the licensees were operating on the range for the full 7-month season.

In 1956 the remaining adjustment was made by agreement with the licensees. The adjustment was not uniform among operators because some voluntarily gave up portions of their grazing privileges on the strength of the BLM's commitment that these would be the first to be restored when range productivity was improved. Reductions in permits varied from 28 percent to nearly 50 percent depending on how much the individual was willing to voluntarily release.

Shortly after the adjudication agreement was prepared, the BLM prepared a plan for intensive development and rehabilitation of this unit with a total cost to the

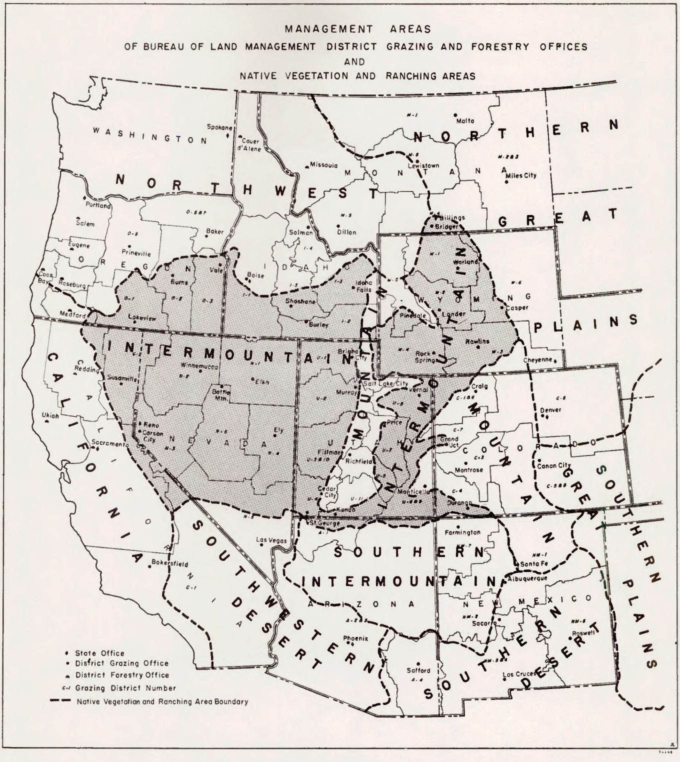

FIGURE 5. THE INTERMOUNTAIN RANCHING AREA OF THE WEST

government expected to be $261,000 (based on a 1960 revision of the plan). Some work was accomplished in 1956 to 1959. However, due to the low level of available funds, there was no substantial progress toward completion of the program until 1960 when program commitments in other areas were completed and all S&M funds for the entire Vale district were used in the Soldier Creek Unit.

There are now nearly 10,000 acres of crested wheatgrass seedings ready for use. These seedings will be used to shift the grazing load from newly seeded areas during their establishment period. By 1963 the BLM will be in a position to begin restoring some of the grazing use reduced in 1956. If we had been financially able to begin a full program of management and conservation treatment in 1956, the allocation of increases in use would have been possible in 1960.

(b) Ranch business mortality:

At the time of adjudication of the Soldier Creek Unit there were 37 individual ranch operations. In 1961 there were 35 individual ranch operations. One rancher had transferred his grazing privileges to another. The transfering ranch held privileges for only a few cattle. The ranch is located within the Antelope Reservoir irrigation project and can exist, without range privileges, by producing cash hay and grain crops. The VD Ranch was purchased by rancher VE and the two properties have been operated as one unit.

Neither of the above transactions resulted from the reduction in grazing use on the Federal range.

All operations in this unit have adjusted to a $4\frac{1}{2}$ months' season-of-use on Federal range in common use areas. There is some late season use permitted on small, fenced individual allotments. The smaller operators commonly keep cattle on their ranches in addition to those which go out on the Federal range.

Data on livestock owned and Federal range use by permittees before and after adjudication are shown in table 7.

Table 7 Herd sizes and permitted use of the Federal range by permittees on the Soldier Creek Unit, Vale Grazing District, in 1952-prior to adjudication and in 1961-after a 40 percent reduction in permitted use applied in 1953 and 1956.

Permittee	Situation in 1952 before adjudication					Situation in 1961 after adjudication					Remarks
	Live-stock Owned1/ (No.)	Permitted Use				Live-stock Owned1/ (No.)	Permitted Use				
		Number (AU)	Date On	Date Off	Total (AUM)		Number (AU)	Date On	Date Off	Total (AUM)	
VF	660 C	300	Apr 1	June 30	900	650 C	450	Apr 8	July 31	1,688	
	25 H	220	Apr 1	Oct 31	1,540	6 H	150	Apr 16	July 31	525	
		90	Apr 16	June 15	180		50	May 1	July 31	150	
					2,620		7	May 1	Sept 30	35	
										2,398	
VG		250	Apr 1	Sept 30	840		221	Apr 8	June 15	498	Has additional use in Idaho
VH	100 C	120	Apr 1	Sept 15	660	780 C	210	Apr 8	Aug 7	840	Received 160 AUMs from VW. Has additional use in several areas. Also carried some nonuse.
							91	Apr 8	May 31	160	
										1,000	
VI	290 C	230	Apr 1	June 30	463	463 C	158	Apr 8	June 15	356	Also has use in Idaho
	25 H	(67% Federal Range)				20 H					
VJ		155	Apr 1	Aug 31	775	130 C	168	Apr 8	Aug 22	756	Supplemental license for use after Aug 8 was issued for use in Rome Seeding transferred 720 AUMs to VX. Also has use in Idaho.
							133	Aug 8	Sept 22	200	
							103	Sept 23	Oct 23	103	
										1,059	
VK	310 C	50	Apr 16	Sept 15	250	248 C	248	Apr 8	Aug 22	1,116	
	20 H	200	Apr 16	Aug 15	800	11 H					
		200	Apr 1	Oct 31	1,400						
		12	Apr 1	Oct 31	84						
		50	Apr 16	Sept 15	250						
					2,784						
VL	450 C	482	Apr 1	July 31	1,928	600 C	322	Apr 15	July 31	1,127	
	15 H						51	Apr 15	July 31	179	
										1,306	
VM		152	Apr 1	Aug 31	760	184 C	92	Apr 10	Aug 10	368	
							92	Apr 16	Aug 15	368	
										736	

1/ C - Cattle
S - Sheep
H - Horses

Table 7 (continued)

Permittee	Situation in 1952 before adjudication					Situation in 1961 after adjudication					Remarks
	Live-stock Owned (No.)	Permitted Use				Live-stock Owned (No.)	Permitted Use				
		Number (AU)	Date On	Date Off	Total (AUM)		Number (AU)	Date On	Date Off	Total (AUM)	
VN		151 45	Apr 16 May 16	Sept 15 Sept 30	755 203 958	240 C	141 10	Apr 23 May 1	Aug 22 Aug 31	564 40 604	Has additional use in Idaho.
VO		262 (80% Federal Range)	Apr 1	June 15	524	196 C 8 H	94 104 6	Apr 8 Apr 16 Apr 8	June 15 June 15 June 15	212 208 14 434	Has additional use in Idaho.
VP		329	Apr 1	Aug 31	1,645	402 C 10 H	284	Apr 8	Aug 22	1,279	Licensed to someone else. During 1952-licensed to VAA 1956-59.
VQ		35 454 250	Apr 1 Apr 1 Oct 16	Oct 31 July 31 Oct 31	280 1,816 125 2,221	460 C 75 H	233 75 75	Apr 8 May 1 Apr 8	Aug 8 Sept 15 Aug 22	1,052 338 338 1,728	
VR	100 C 10 H	30 94	Apr 1 Apr 1	Sept 30 Oct 31	180 658 838	202 C 10 H	111 23	Apr 8 Apr 23	Aug 22 Sept 6	500 104 604	
VS	175 C 10 H	149	Apr 1	Aug 31	745	255 C 12 H	192 50 10 25	Apr 8 Apr 8 Apr 8 Apr 8	June 15 Aug 22 Aug 22 Aug 22	432 225 45 Non use 702	Has additional use in Idaho
VT	200 S 300 C 10 H	200 40 240 240	Apr 1 Sept 1 Apr 1 Oct 16	Aug 31 Oct 31 June 15 Dec 15	1,000 80 600 480 2,160	490 C 5 H	318	Apr 8	Aug 22	1,431	1952 license issued to VAB.
VU	175 C 12 H	225 8	Apr 1 Apr 1	Aug 31 July 15	1,125 28 1,153	700 C	308	Apr 8	Aug 7	1,232	Has additional use in other areas. Licensed to VAC-1952-1960.
VV		206	Apr 1	Aug 31	1,030	175 C	175	Apr 8	Aug 8	700	Licensed to VAD 1952-1960.

Table 7 (continued)

Permittee	Situation in 1952 before adjudication					Situation in 1961 **after** adjudication					Remarks
	Live-stock Owned (No.)	Permitted Use				Live-stock Owned (No.)	Permitted Use				
		Number (AU)	Date On	Date Off	Total (AUM)		Number (AU)	Date On	Date Off	Total (AUM)	
VAE		80	Apr 1	Aug 31	400	200 C 9 H	126 15	Apr 8 Apr 8	July 31 July 31	473 57 530	**Leasing VAQ and VAR base properties.**
VAF	90 C	60 (taken from 1955 license)	Apr 1	July 31	240	36 C	59	Apr 8	July 22	207	
VAG											Appeal status Case file not available
VAH	230 C 10 H	120	Apr 1	Aug 15	540	123 C 9 H	86	Apr 8	Aug 22	Non use	Has use in other areas
VAI	375 C	188	Apr 1	July 15	657	400 C 10 H	153	Apr 8	Aug 7	612	Has additional use in other areas.
VAJ	12,000 S	160	Apr 1	May 31	320	11,800 S	160	Apr 8	May 31	288	Has additional use in other areas.
VX	925 C 20 H	876	Apr 1	Aug 31	4,380	995 C 15 H	138 532 200	Apr 8 Apr 8 May 1	Aug 22 Aug 7 July 31	621 2,128 600 3,349	1961 figures includes 720 AUMs received from **VK by transfer.**
VAK	613 C	560	Apr 1	June 15	1,400	528 C	528	Apr 8	June 15	1,188	Has additional use in Idaho
VAM	300 C 8 H	687	Apr 1	Aug 31	3,435	850 C 11 H	400 350 50 4	Apr 8 Apr 16 Apr 22 Apr 1	Aug 7 Aug 15 Aug 21 July 31	1,600 1,400 200 16 3,216	Has use in other areas
VAN		69	Apr 1	Aug 31	345	112 C	174 37 49	Apr 8 Apr 8 Aug 1	July 31 July 31 Aug 31	653 139 49 841	Acquired 278 AUMs from **VAR-leasing 188 AUM's from VAC.**
VAO		69	Apr 1	Aug 31	345	No license in Soldier Creek Unit traded **with VAC for Cow Creek use.**					
VAP	217 C	238 (67% Federal Range)	Apr 1	June 15	399	202 C	210	Apr 8	June 15	473	Has addition use in Idaho

Table 7 (continued)

Permittee	Situation in 1952 before adjudication					**Situation in 1961 after adjudication**					Remarks
	Livestock Owned (No.)	Permitted Use				Livestock Owned (No.)	Permitted Use				
		Number (AU)	Date On	Date Off	Total (AUM)		Number (AU)	Date On	Date Off	Total (AUM)	
VAT	900 C	700	Apr 1	Aug 15	3,150	600 C	343	May 1	Sept 15	1,994	Non use on the 342 AUMs
	30 H	200	Oct 15	Oct 31	100		50	Apr 8	Aug 22	225	Has additional use in Idaho
		20	Apr 1	Oct 31	140		76	Apr 8	Aug 22	Non use	
					3,390					2,219	
VAU	110 C	100	Apr 1	June 15	168	125 C	125	Apr 8	June 15	282	Has additional use in Idaho
		(67% Federal Range				8 H					
VAV		203	Apr 1	Aug 31	1,015	297 C	151	Apr 10	Aug 10	604	971 AUMs from lease of **VAX base property.**
	The above figures are from 1955 license **VAV** owned considerable other property during 1952 - 1954						100	Apr 8	May 31	175	**Has additional use in Idaho.**
							63	Apr 8	Aug 22	284	
							100	Apr 8	Aug 22	450	
							57	Nov 1	Nov 30	57	
										1,570	
VAW		185	Apr 1	Aug 15	819						**Transferred 278 AUM's to VAN. Sold base property with remainder of qualifications to VAE.**

(c) Plans for the future:

Soldier Creek Unit is now being divided into four group allotments. The range development and rehabilitation program is planned so that each allotment will be fully developed and rehabilitated. The seeded areas will be used for spring turn-out pastures to relieve grazing pressure on native vegetation during the critical early spring months. As a result of the rehabilitation program, together with a plan of rotation management, using each area to fill a particular management need, it is expected that the reduced grazing privileges should be fully restored within ten years.

(d) Administrative problems:

The shortage of appropriated funds for development and rehabilitation action concurrent with grazing reductions has created a problem. Substantial improvement in the forage supply could have been realized in a much shorter time if sufficient funds had been available when needed.

(e) Example of the adjustments made in an individual case: Rancher VR:

In 1952, four years prior to the reduction in use in the Soldier Creek Unit, VR was operating 124 cattle on the Federal range as follows:

94 cattle from April 1 to October 31
30 cattle from April 1 to September 30
Total use on Federal range was 838 AUM's

In 1961 the VR ranch was operating 133 cattle on Federal range as follows:

111 cattle from April 8 to August 22
23 cattle from April 23 to September 6
Total use on Federal range is 604 AUM's

The 23 cattle are grazed in a small, fenced, individual allotment which lies adjacent to the base property. The season of use on the common use allotment is 4½ months, from April 8 to August 22. By the BLM's permitting a

staggering of date at turn-out time and at gathering time, according to actual operating conditions, livestock operators are assisted in keeping numbers of livestock on the range as high as possible. In VR's case, he is actually running more livestock than he was prior to the reduction. While this increase in numbers does not occur in all cases, each rancher who had an economic unit prior to the reduction, still has an economic operation. VR is in process of developing supplemental pasture through seeding of private native range and conversion of a portion of his hayland to pasture. Many of the other ranchers are doing or have done the same thing.

The smaller operators, such as VAY, own additional livestock that are kept on base property after the range livestock have been turned out.

Coordinating the use and development of the privately-owned lands with use of BLM lands, generally resulted in a more flexible operation and more sound economic unit.

2. Mahogany Unit

(a) Sequence of events:

The Mahogany Unit lies in east-central Malheur County. (See Figure 1.) It is bounded on the east by the Idaho-Oregon line, on the west by the deep, rugged, Owyhee River canyon, on the South by Cow Creek and on the north by the Owyhee River and the Owyhee irrigation project.

Of the 413,000 acres in the unit, 340,000 acres are administered by the Bureau of Land Management. The higher elevation, better quality, lands are privately owned, fenced, and are used primarily for late fall pasture only. Consequently, most of these private areas are in good to excellent condition. The Federal range has been used heavily for the seven-month period of April 1 to October 31. Year-round trespass use by horses and unseasonal and heavy use by both cattle and sheep have resulted in extreme deterioration of areas accessible from water. There is also a heavy population of mule deer.

stockpiling of data at turn-out time and at gathering time according to actual operating conditions. Livestock operators are assisted in handling numbers of livestock at the range as high as possible. As it's seen, he is actually running more livestock than he was prior to the reduction. While this increase in numbers does not occur in all cases, each rancher who had an adjustment made prior to the reduction, still has an economic operation. He is in process of developing supplemental pasture through seeding of private patented lands and conversion of a portion of his meadows to pasture. Many of the other ranchers are doing or have done the same thing.

The smaller operators, such as [illegible], own additional livestock that are kept on base property after the major livestock have been turned out.

Coordinating the use and development of the private grazing lands with use of the Federal lands. Generally, there is a more flexible operation and more sound economic unit.

4. Mahogany Unit

(b) Sequence of events:

The Mahogany Unit lies in east-central Malheur County. (See Figure 1.) It is bounded on the east by the Idaho-Oregon line, on the west by the deep, rugged, Owyhee River canyon, on the south by [illegible] Creek and on the north by the Owyhee River and the Owyhee Irrigation project.

Of the 113,000 acres in the unit, 94,000 acres are administered by the Bureau of Land Management. The higher elevation, better quality lands are privately owned, fenced, and are used primarily for late fall pasture only. Consequently, most of these private areas are in good to excellent condition. The Federal range has been used heavily for the seven-month period of April 1 to October 31. Year-round trespass use by horses and unbranded and heavy use by both cattle and sheep have resulted in extreme deterioration of areas accessible from water. There is also a heavy population of mule deer.

In order to correct this situation a forage inventory (range survey) of the unit was made in 1954 and 1955. The results of this survey, after adjustments made for wildlife use, showed that a reduction in livestock use amounting to 42.8 percent of the recognized demand was necessary.

This reduction was accomplished through an agreement with the licensees in March 1960. No reduction was taken in 1960, one-half was taken in 1961, and the balance is scheduled to be taken in 1962.

In working out the needed reduction to provide the greatest benefit to the range and to be the least detrimental to the livestock operations, a combination adjustment in time of use of the range and numbers of permitted livestock was effected. In all cases, the actual reduction in numbers of permitted livestock will probably not exceed 20 percent. Some of the extremely small ranches, that have surplus production on their base property and can take care of their stock for a longer time, will not reduce permitted numbers on the range to the extent of 20 percent. More of their reduction will be in time of use.

The reduction in permitted numbers varies widely with the capabilities and resources of the individual ranch unit. Many operators can convert privately-owned meadow into grass pasture; others have fenced private ranges that can be seeded. By these means and others they can adjust and coordinate use of private and Federal lands.

(b) Ranch business mortality:

To date there are no indications that any of the ranches in the Mahogany Unit will fail because of the reductions in Federal range use.

(c) Plans for the future:

Complete plans for improved management, conservation, and rehabilitation of the Mahogany Unit were prepared during the year following the signing of the adjudication agreement.

The plan calls for division of the Unit into three common use allotments with seasonal use divisions within each allotment. There will be approximately 45,000 acres of reseeding plus 45,000 acres of sagebrush control work to bring about rapid improvement of the sites treated. Improvement of the balance of the Unit will occur through application of sound management practices.

Only about $30,000 in Federal funds have been expended in this Unit since the passage of the Taylor Grazing Act. An additional $781,000 will be needed to do a complete job of development and rehabilitation.

(d) Administrative problems:

At the present level of appropriations it will take 8 to 10 years to accomplish this program even if no consideration is given to other units within the district which need the same type of program.

(e) Example of the adjustments made in an individual case: Rancher VAZ.

Prior to the reduction VAZ was operating 345 cattle on the Federal range with 1,840 AUM's of forage allowed.

In 1961, with one-half of the reduction taken, VAZ was licensed for 325 cattle and 1,496 AUM's of use.

While the 1962 license is not completely worked out, VAZ will be able to operate approximately 285 cattle on the Federal range for 1,052 AUM's.

These adjustments were worked out by analyzing the sources of each operator. Those operators whose livestock graze inthe same area were considered collectively and a method of licensing devised which would conform to practical operating conditions and also permit improvement and rehabilitation of the range.

Range opening dates were adjusted to stagger livestock turnout and gathering. Intermediate gathering dates were decided upon that conform with local practice.

In VAZ's case, one-half of the reduction was absorbed in time and the balance in permitted livestock numbers.

The plan calls for division of the Unit into three common use allotments with seasonal use divisions within each allotment. There will be approximately 46,000 acres of reseeding plus 4,000 acres of sagebrush control work to bring about rapid improvement of the sites treated. Improvement of the balance of the Unit will occur through application of sound management practices.

Only about $30,000 in Federal funds have been expended in this Unit since the passage of the Taylor Grazing Act. An additional $700,000 will be needed to do a complete job of development and rehabilitation.

(d) Administrative problems:

At the present level of appropriations it will take 8 to 10 years to accomplish this program even if no consideration is given to other units within the district which need the same type of program.

(e) Example of the adjustments made in an individual case: Rancher "A"

Prior to the reduction, "A" was operating 345 cattle on the Federal range with [illegible] AUM's of Federal allotment.

In 1961, with one-half of the reduction taken, "A" was licensed for 325 cattle and 1,540 AUM's of use.

While the 1962 license is not completely worked out, "A" will be able to operate approximately 305 cattle on the Federal range for 1,032 AUM's.

These adjustments were worked out by analyzing the economics of each operation. Large operators whose livestock graze in the same area were considered collectively, and a means of licensing devised which would conform to operational requirements and also permit improvement and rehabilitation of the range.

Range opening dates were adjusted to stagger livestock arrival and gathering. Intermediate graduated dates were decided upon that conform with local practices.

In "A's" case, one-half of the reduction was absorbed in time and the balance in permitted livestock numbers.

This is typical of most operators in the unit. Time reduced at the end of the season is time which commonly was not utilized anyway due to livestock returning to the base property naturally during late summer and fall.

VAZ has 640 acres of privately-owned native range on Spring Mountain and a small allotment adjacent to his base property that he reserves for fall use. In this manner he can make the needed adjustment without undue disruption in his operation.

B. Burley Grazing District, Idaho. (See Figure 1.)

1. Junction Unit

(a) Sequence of events:

The Junction Unit is located along the Utah-Idaho border almost due south of Burley, Idaho. (See Figure 1.) Topographically it ranges from a flat area on the east to rapidly ascending mountains and steep canyons to the west. The vegetation is desert shrub on the lower, flat area consisting mainly of Halogeton, salt sage, sagebrush, and a few weak perennial grasses. The higher slopes are dominated by pinon-juniper. Historically the area, as the name implies, was a junction between two heavily used livestock movement areas. The Oregon Trail-California Trail merged with the Utah to Oregon Stage route in Junction Valley. At the time reductions were imposed the area had been badly depleted and an invasion of the poisonous weed, Halogeton, was in progress. There were 16 users involved in this adjustment. The majority were small operators. The size of operations varied between 30 and 500 head of cattle.

The adjustment process began in October of 1955. A total of 18,559 acres of Federal land produced only 1,416 AUM's of forage. This was determined by a weight-estimate range survey made in 1952 and 1953. After several meetings in 1955, a decision was rendered in February 1956 setting forth the necessity for a 43 percent reduction in permitted use, concurrent with application of management practices to facilitate development and improvement of the area. These arrangements provided individual allotments for all operations susceptible to management on an allotment basis. The balance of the unobligated demand was put in a community allotment.

This is typical of most operators in the unit. Thus reduced at the end of the season is time which commonly was not utilized anyway due to livestock returning to the base property naturally during late summer and fall.

V.L. has 640 acres of privately-owned native range on Spring Mountain and a small allotment adjacent to his base property that he reserves for fall use. In this manner he can make the needed adjustment without undue disruption in his operation.

B. Burley Grazing District, Idaho. (See Figure 1.)

1. Junction Unit

(a) Sequence of events:

The Junction Unit is located along the Utah-Idaho border almost due south of Burley, Idaho. (See Figure 1.) Topographically it ranges from a flat area on the east to rapidly ascending mountains and steep canyons to the west. The vegetation is desert shrub on the lower, flat area consisting mainly of halogeton, salt sage, sagebrush, and a few weak perennial grasses. The higher slopes are dominated by pinon-juniper. Historically the area, as the name implies, was a junction between two heavily used livestock movement areas. The Oregon Trail-California Trail merged with the Utah to Oregon Stage route in Junction Valley. At the time reductions were imposed the area had been badly depleted and an invasion of the poisonous weed, halogeton, was in progress. There were 16 users involved in this adjustment. The majority were small operators. The size of operations varied between 50 and 300 head of cattle.

The adjustment process began in October of 1955. A total of 10,000 acres of federal land produced only 1,416 AUM's of forage. This was determined by a weight-estimate range survey made in 1952 and 1953. After several meetings in 1955, a decision was rendered in February 1956 setting forth the necessity for a 42 percent reduction in permitted use, concurrent with application of management practices to facilitate development and improvement of the area. These arrangements provided individual allotments for all operations susceptible to management on an allotment basis. The balance of the unobligated demand was put in a community allotment.

The topography, accessibility of the forage, water location, location of the allotment in reference to the ranch, and other factors were considered in determination of the allotments. Also, the potential of the land for seeding development was estimated, and firm plans for seedings were made. Initially this meant that most of the community group could not make customary April use, at least until the seedings came into full production. The allotments were fenced by the users in 1957 and the adapted areas were plowed and seeded in 1956 and 1957. The Junction seeding of 3,472 acres, which cost the Government $16,368, is not a high producer because of adverse site characteristics. In 1961, 1,400 acres in the Junction seeding were sprayed and drilled in an attempt to increase forage production. The Spark's Basin seeding of 828 acres cost $6,240;;it has responded very well, and in 1959 the permittees in this area were restored 25 percent of their initial reduction.

(b) Mortality of ranch operations:

With one exception, all ranchers involved in the 1956 reduction are still in business in 1961. Rancher BG transferred his grazing privilege to Rancher BH but he remained in the livestock business, using private land and the national forest. BH increased his herd through the purchase of BG's privileges and the purchase of some additional private land.

The before and after adjudication situation of each Junction Unit permittee is shown in Table 8.

Table 8 **Herd sizes and permitted use of the Federal range by permittees on the Junction Unit, Burley Grazing District, in 1955-prior to adjudication-and in 1961-after a 43 percent reduction in permitted use applied in the fall of 1955.**

Permittee	Situation in 1955 before adjudication					Situation in 1961 **after** adjudication					Remarks
	Livestock Owned[1/] (No.)	Permitted Use Number (AU)	Date On	Date Off	Total (AUM)	Livestock Owned[1/] (No.)	Permitted Use Number (AU)	Date On	Date Off	Total (AUM)	
BD	155 C	95	May 1	Sept 30	380	155 C	95	May 1	June 15	142	
BH	46 C	31	May 1	June 15	78	115 C	102	May 1	June 15	153	
		29	June 15	Sept 15	87		62	June 16	July 15	62	
		15	Sept 6	Ncv 30	38		38	July 16	Nov 30	171	
					203					386	
BI	70 C	34	May 1	Oct 31	204	40 C	16	June 1	Sept 30	64	
							37	May 1	May 31	37	
							16	Oct 1	Oct 31	16	
										117	
BJ	30 C	25	Apr 1	June 15	63	38 C	7	May 1	May 31	7	
		14	June 16	Sept 15	42		8	June 1	Nov 30	48	
					105		17	June 1	June 15	9	
							18	June 16	July 15	18	
										82	
BK	100 C	89	Apr 16	May 31	134	116 C	60	May 1	May 31	60	
		69	June 1	Sept 30	276		20	June 1	Sept 30	80	
		4	Apr 16	Sept 30	22		6	Oct 1	Oct 31	6	
					432		66	Nov 1	Dec 31	112	
										258	
BG	300 C	24	May 1	Oct 31	144	258 C					Sold to **BH**
BL	65 C	21	May 1	Aug 15	74	45 C	21	May 1	May 31	21	
							21	Oct 1	Oct 31	21	
										42	
BM	500 C	488	May 1	Nov 15	1,999	530 C	350	No Date	No Date		Can't separate for this chart.
BN	190 C	123	Apr 10	June 15	266	120 C	95	May 1	May 31	95	
		8	Apr 1	July 31	32		16	May 1	Nov 30	113	
					298					208	

1/ C - Cattle
S - Sheep
H - Horses

Table 8 (continued)

Permittee	Situation in 1955 before adjudication					Situation in 1961 after adjudication					Remarks
	Livestock Owned (No.)	Permitted Use				Livestock Owned (No.)	Permitted Use				
		Number (AU)	Date On	Date Off	Total (AUM)		Number (AU)	Date On	Date Off	Total (AUM)	
BA	35 C	37	Apr 1	Nov 30	296	41 C	39	May 1	May 31	39	
		1	Apr 1	July 30	4		35	Apr 1	Apr 30	20	
					300		13	June 1	Sept 30	30	
							13	Nov 1	Dec 31	13	
							39	Oct 1	Oct 31	39	
										141	
BO	210 C	22	May 1	May 30	22	180 C	17	May 1	May 30	17	
BB	70 C	18	May 1	Aug 31	72	60 C	10	May 1	Aug 31	40	
BE	300 C	120	Apr 1	Nov 30	52	250 C	30	May 1	May 10	10	Traded to BO
BP	223 C				375		192			375	Seeding Area
BQ	45 C				270		45			270	

(c) Example of adjustments made in an individual operation: Rancher BH

This operation is one resulting from a division of the Almo Sheep Company which was a community band operated by small ranchers in the area. The Almo Sheep Company was a highly controversial and uneconomical cooperative that broke up in the early 1930's. The proportion of the privilege accruing to BH was for 225 sheep, April 1 to August 1, in the Junction Unit, and August 1 to September 30 in the Jim Sage Unit. In 1953 the sheep permit was converted to cattle. The maximum qualification for this operation was established in 1955 as follows:

15 cattle	April 1 to November 30	120 AUM's	Jim Sage Unit
16 cattle	April 1 to June 15	40 AUM's	Junction Unit
14 cattle	June 15 to September 15	42 AUM's	Junction Unit

All these privileges were attached to 240 acres of base property of which 160 acres were in hay production. The total production in the base amounted to 999 AUM's. During most of this time BH worked part-time at other occupations. In the winter he cut and sold posts and Christmas trees produced on public lands.

His yearlong operation, in 1955, was approximately as follows:

December 1 to March 31	46 cattle	Base property	184 AUM's
April 1 to June 15	31 cattle	Federal range	78 AUM's
	15 cattle	Base property	37 AUM's
June 15 to September 15	29 cattle	Federal Range	87 AUM's
	17 cattle	Base property	51 AUM's
Sept. 16 to November 30	15 cattle	Federal range	38 AUM's
	31 cattle	Base property	77 AUM's
			552

46 cattle x 12 months = 552 AUM's needed

Actual forage production available:	Federal range	203
	Base property	999
		1,202 AUM's

When the 43 percent reduction in grazing privileges was applied in 1956, BH found it necessary to adjust drastically his operation. He also wanted to be a full-time rancher and not work away from home so much as in the past. This required investment in a larger herd.

In November of 1958 BH purchased 160 acres of land from BG and seeded this land to tall wheatgrass. He also acquired the BG permit for 24 cattle and 148 AUM's in the Junction Unit. In 1960 he purchased a national forest permit for 15 cattle from June 15 to September 15. In 1961 his father, BJ, transferred all of his property and range privileges to BH. Up until 1960 BH worked summers for BLM as a survey aid to the cadastral engineers. Since then he has worked full-time on the ranch.

His present yearlong operation is roughly as follows:

December 1 to April 30	115	cattle base at Almo	575 AUM's
May 1 to May 30	102	cattle Federal range	102 AUM's
	13	cattle base at Almo	13 AUM's
June 1 to June 15	102	cattle Federal range	51 AUM's
	13	cattle base at Heath Canyon	13 AUM's
June 16 to July 15	62	cattle Federal range (Sparks Basin)	62 AUM's
	15	cattle national forest	15 AUM's
	38	cattle private seedings	38 AUM's
July 16 to Sept. 15	38	cattle Federal range	76 AUM's
	15	cattle national forest	30 AUM's
	62	cattle private seedings	124 AUM's
Sept. 16 to Nov. 30	38	cattle Federal range	95 AUM's
	77	cattle private seedings at Almo	192 AUM's

AUM's Used

385	Federal range
955	base property
45	national forest
1,386	AUM's

In summary, Rancher BH adjusted to the Federal range reduction by (1) purchasing additional grazing privileges (2) acquiring additional privately-owned lands, and (3) improving his deeded rangeland by seeding and water development to provide for summer use. During the period of adjustment, the breeding herd was increased from 46 to 115 head.

2. Artesian Unit

(a) Sequence of events:

The Artesian Unit lies southeast of Twin Falls, Idaho. It consists of the Federal land between an irrigated area and the Sawtooth National Forest. Topographically the area is made up of steep, north-facing foothills which are cut by deep canyons. The vegetation is mostly cheatgrass in the lower reaches merging into native perennial grasses with a mixture of browse species. The area is an important winter range for the large Cassia deer herd. In the early days, this area was used heavily by large Nevada cattle herds and, after about 1915, by farm-project settlers. The area was badly depleted by overuse and frequent fires. The Unit includes 31,622 acres of Federal range and is used by eight permittees. The bulk of the use was made by sheep enroute from the Twin Falls farming area to the national forest. A weight-estimate range survey was made in 1953 that showed an available grazing capacity of 3,461 AUM's. Due to heavy demands of the game herd, 1,017 AUM's of the forage were reserved for wildlife, leaving a balance of 2,244 AUM's for livestock use. The obligation to the ranchers was 4,582 AUM's which necessitated a 51 percent reduction in permitted use. This was accomplished by a decision and an agreement in late 1956. The area was divided into individual allotments, and two seeding projects were established. The Cold Springs seeding (488 acres at a cost or $2,715) and the Artesian seeding (1,074 acres at a cost of $6,159). Both seedings were cooperatively financed by BLM and the permittees. The fencing was paid for by the users; however, water developments and access roads were financed by BLM. The seeding was successful and has been used since 1960. Two of the users have had their earlier reductions partly restored due to these seedings. In 1960 a devastating range fire destroyed 6,200 acres of the Unit mainly affecting the BS allotment. This area was reseeded and further fenced and at present is being protected.

(b) Mortality of ranch business:

As of December 1961 all of the ranchers included in the 1956 adjudication are still in business with the exception of BT, who sold out to BF. These permittees all have good farms, and receive much of their income from hay and row

2. Artesian Unit

(a) Sequence of events:

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(b) Stability of ranch business:

As of December 1961 all of the ranchers included in the 1956 adjudication are still in business with the exception of #57, who sold out to #8. These ranchers all have good farms and receive much of their income from hay and row

Table 9 **Herd sizes and permitted use of the Federal range by permittees on the Artesian Unit, Burley Grazing District, in 1956-prior to adjudication- and in 1961-after a 51 percent reduction in permitted use applied in the fall of 1956.**

Permittee	Situation in 1956 before adjudication					Situation in 1961 after adjudication					Remarks
	Livestock Owned 1/ (No.)	Permitted Use Number (AU)	Date On	Date Off	Total (AUM)	Livestock Owned 1/ (No.)	Permitted Use Number (AU)	Date On	Date Off	Total (AUM)	
BU	2,600 S 500 C				968	2,250 S 200 C				928	Use in several different units.
BS	40 C	100 20 100 25	Apr 10 Apr 15 Oct 1 July 15	May 15 May 15 Dec 20 Sept 15	117 20 266 50 453	100 C	100 100 22	Apr 16 June 1 Oct 16	May 31 June 15 Nov 15	150 50 22 222	2/
BV	15 C	15	Apr 10	Dec 10	120	160 C	160 134	Apr 16 Oct 16	May 31 Dec 15	240 268 508	Estate sold off stock in 1954. 2/
BF	162 C	162	Apr 15	June 15	330	180 C	180	May 1	June 15	270	
BW	1,200 S	240	Apr 1	June 15	976	1,960 S 125 C	392 25 125	May 10 Apr 1 Nov 1	Nov 30 June 30 Dec 31	1,303 75 250 1,628	Moved all reduced privileges to seeding in Salmon Tract.
BR	4,500 S 100 C	900 100 1,000			310	4,500 S 170 C 45 H	900 170 45 1,115			215	
BX	16 C	16	Apr 1	Nov 30	110	60 C	53	May 1	May 31	53	
BY	950 S 5 C	195	Apr 1	June 30	612	1,100 S 6 C 5 H	231	May 1	June 15	624	

1/ C - Cattle
S - Sheep
H - Horses

2/ A transfer of grazing privileges occurred within this family operation. Thus direct 1956-61 comparisons are not possible. These operations took complete nonuse after the adjudication and began a substantial program of cooperative range rehabilitation.

crops, mainly beans, sugar beets, and potatoes. **Livestock** is a supplementary enterprise in many cases. Several of the outfits, however, derive the major portion of their income from livestock.

Rancher situations before and after adjudication are detailed in Table 9.

(c) Future plans:

The only plans beyond those already effected are mainly for fire protection, and for further cross fencing to prevent livestock from moving into the higher country too early. Minor water developments may be necessary.

(d) Administrative problems:

The main problem encountered in making the adjustment resulted from the fact that the use in this unit was only part of the ranchers' total BLM use. To reduce this until 51 percent and not other units where these same permittees operated caused some unbalance within ranchers' total operations. A second problem was the large amount of forage that was necessary to reserve for wildlife use. A third and vital consideration concerned the availability (timing and amounts) of Federal funds to effect the management plan. It was not until FY 1959 that funds were available for the Cold Springs Seeding. Some vital water facilities could not be developed until the 1961 fiscal year.

(e) Rancher adjustments:

Four of the larger operations solved the feed and time deficit in this area by transferring the reduced AUM's to a large BLM range seeding in Salmon Tract Unit some 15 miles west of Artesian Unit. Seeding in the Salmon Tract area rehabilitated large range areas that had not been used in recent years due to a heavy stand of sagebrush and the lack of forage plants. The Salmon Tract seedings were cooperative BLM-permittee ventures with BLM investing about two-thirds of the total funds. BV ranch was in the process of an estate settlement in 1956 and had disposed of nearly all of its livestock. They are only now rebuilding a herd, and there is ample forage available for them due to seedings, deferment, and better livestock distribution over the range. Even though the reduction was drastic in this area, most of the ranches experienced little difficulty in adjusting to it.

crops, mainly beans, sugar beets, and potatoes. Livestock is a supplementary enterprise in many cases. Several of the outfits, however, derive the major portion of their income from livestock.

Season allocations before and after adjudication are detailed in Table 6.

(c) Future plans:

The only plans beyond those already effected are mainly for fire protection, and for further cross fencing to prevent livestock from moving into the higher country too early. Minor water developments may be necessary.

(d) Administrative problems:

The main problem encountered in making the adjustment resulted from the fact that the use in this unit was only part of the permittees' total BLM use. To reduce this unit 51 percent and not reducing units where these same permittees operated caused some unbalance within permittees' total operations. A second problem was the large amount of range that was necessary to reserve for wildlife use. A third and final consideration concerned the availability (timing and amounts) of federal funds to effect the management plan. It was not until FY 1959 that funds were available for the Cold Springs seeding. This with water facilities could not be developed until the 1961 fiscal year.

(e) Permittee adjustments:

One of the larger operations solved the feed and time deficit in this area by transferring the reduced AUM's to a large pasture seeding in Palmer Tract Unit, some 15 miles west of Arveston Unit. Seeding in the Palmer Tract area was necessitated since range areas there had not been used in recent years due to a heavy stand of sagebrush and the lack of forage plants. The Palmer Tract seedings were cooperative with permittee ranchers with BLM investing about two-thirds of the total funds. One ranch was in the process of an estate settlement in 1955 and had disposed of nearly all of their livestock. They are only now rebuilding a herd, and there is ample forage available for them due to seedings, deferment, and better livestock distribution over the range. Even though the reduction was drastic in this area, most of the ranches experienced little difficulty in adjusting to it.

(f) Example of the adjustments made in an individual case: Rancher BF

This particular operation was established under the Federal Range Code provisions in 1937 by BZ. The operation she listed at that time, taken from her 1937 application, was as follows:

> Land as Base - 314 acres of which 234 were cultivated. The customary yearlong operation, based on Mrs. BZ's statements, were for 2,160 AUM's.

Dec. 15 to Feb. 28	180 cattle	ranch base	450 AUM's
Mar. 1 to Apr. 30	180 cattle	Federal range	360 AUM's
May 1 to Oct. 31	180 cattle	national forest	1,080 AUM's
Nov. 1 to Dec. 15	180 cattle	Federal range	270 AUM's

By 1955, several events had affected this ranch:

(1) BZ died and the ranch went into an estate status in 1949.

(2) The national forest permit seasonal dates were adjusted to June 1 to October 15 (with no reduction in numbers) and 810 AUM's. This adjustment was taken by the simple expedient of trespassing on BLM land.

(3) The licenses were carried for 180 cattle throughout the estate period, except for one year; however, when the estate was settled in May 1950, the livestock inventory consisted of 86 cows, 3 bulls, and 56 weanling calves, a total of 145 head. The breeding herd had declined from 180 to 86 head.

(4) The property and holdings were sold to BT on June 7, 1956, just prior to the adjudication. BT worked full time for Idaho Power Company.

(5) The Artesian Unit adjustment took place in 1956. The only controversy concerned the area assigned for individual use. The 51 percent reduction in Federal grazing privilege was not questioned.

(6) The property was sold to BF on February 5, 1960. The 314 acres of base property produced 2,594 AUM's of feed in 1956.

For the current year (1961), BF has rebuilt the breeding herd to 180 cows. The yearlong operation is as follows:

Jan. 1 to April 30	180 cattle	ranch base	720 AUM's
May 1 to May 31	162 cattle	Federal range(Artesian)	162 AUM's
May 1 to May 31	18 cattle	ranch base	18 AUM's
June 1 to Oct.15	180 cattle	national forest	810 AUM's
Oct.16 to Nov.15	61 cattle	Federal range (Cold Springs Seed.)	61 AUM's
Oct.16 to Nov.15	119 cattle	ranch base	119 AUM's
Nov.16 to Dec.31	180 cattle	ranch base	270 AUM's
			2,160 AUM's

In 1958, BT contributed $676 toward a 480-acre seeding, known as Cold Springs Seeding. BF made the first use of this area in the fall of 1961.

In summary, the original operation of 1937 listed ownership for 220 cattle. The privilege for use of the Federal range was finally determined to be actually for 180 head. Today, after several adjustments on both BLM and national forest lands, the ranch still has 180 cattle. In addition, row crops are grown, and both the father and son have part-time jobs off the ranch.

Economic Impact of Adjudication on Ranches

To examine and illustrate what happens to ranches faced with reduction in BLM permits as a result of adjudication, three ranch models were constructed. These models were devised to represent small (approximately 200-cow unit) ranches in the Vale district in Oregon and the Burley district in Idaho. Data used in construction of these models were taken partly from recent interviews of ranchers in those localities and partly from results of recent research findings. The price level used for cattle sold is based on a projected long-term price of $18/cwt for all beef cattle. This is lower than current prices and tends to present a conservative picture of ranch income. Cost levels for ranch expenses are generally those for the 1959-60 period.

Model Ranch I, Vale Grazing District

With a basic breeding herd of 200 cows and heifers, this ranch uses good quality bulls at a ratio of 1 bull: 20 cows. Bulls are used for three years. Breeding is accomplished on the range between June and October. The calf crop weaned is 75 percent of all the cows and heifers in the breeding herd. Gross replacement of the cow herd is at a 20 percent rate. Death losses are about 5 percent. Replacement heifers are placed directly into the cow herd and consequently bred to drop their first calf when about 2 years old. About 65 percent of the calves are born prior to the first of June; replacements are selected from these calves and the balance sold as weanling calves. The remaining 35 percent of the calf crop, born after June first, is held for sale the next fall.

The long-run average gross income of this ranch is as follows:

	Avg.weight	Avg.Price	Receipts
30 cull cows	900 lbs.	$13.50	$ 3,645.00
25 yearling steers	600 lbs.	$20.00	3,000.00
25 yearling heifers	575 lbs.	$19.00	2,731.25
48 steer calves	390 lbs.	$21.50	4,024.80
7 heifer calves	375 lbs.	$19.00	498.75
			$13,899.80

TOTALS 77,720 lbs. of beef
Average price $17.88

Land Owned:

240 acres of native meadow hayland yielding	1 ton/acre
40 acres of native meadow pasture yielding	3 AUM/acre
20 acres of alfalfa yielding	3 tons/acre
640 acres of excellent native rangeland with capacity of	4 acres/AUM
5 acres farmstead, corrals, etc.	

Labor Used:

Family labor accomplishes most of the ranch work, but one man is hired from April through October.

Horses:

This ranch has 6 horses; 4 saddle horses and one team of draft animals.

Buildings and Improvements:

A shop and machine shed, granary, stock shelter, work corral, 20 miles of fencing, well and pump on farmstead, feed racks, water tanks, and troughs.

Machinery and Equipment:

Two tractors, pick-up truck, 50 percent farm share of family auto, mower, dump-rake, mounted hydraulic stacker, 2 wagons, ditcher, plow, saddles and harness, gas tank and pump, PTO spray unit, branding irons, veterinary equipment, and various small tools and shop equipment.

Feed Requirements and Sources:

This ranch requires 3,192 AUM's of feed for the entire year. Prior to adjudication it holds a permit for 1,820 AUM's of feed on the Federal range. This is for 260 cattle from April 1 to October 31. This license was based on ranch commensurability and use made before the Taylor Grazing Act when competition for unregulated ranges required early turn-out with large numbers of cattle. Since then, without the pressure of competition, ranchers have found it unprofitable to turn hungry cattle out on ranges not yet producing usable feed. Similarly, ranchers commonly remove their cattle

from the dry Federal range and place them on private ranges and cropland before their license requires it. Consequently, though the license for this ranch is for 1,820 AUM's from April 1 to October 31, actual use of the Federal range is for 1,344 AUM's between April 8 and October 15.

In terms of permitted use, this ranch appears to obtain 57 percent of its annual feed from BLM lands; in actuality the percentage is 42. The balance of the year's feed (53 percent; 1,848 AUM's) is provided by ranch resources - winter feed, meadow pasture, owned range, and crop aftermath. Most of the winter feed is produced on the ranch; protein supplement, oats, and salt are purchased. Stock are fed hay for an average of 105 days between mid-December and early to mid-April.

Ranch investments, expenses and income are summarized as follows:

Long-run average investments

Land (1960 market value)	$29,130
Breeding herd	27,333
Horses	1,200
Buildings and improvements	12,073
Machinery and equipment	8,583
TOTAL	$78,319

Noncash expenses

Interest (5%) on long-run investment	$3,916
Interest (6%) on average working capital	174
Depreciation (on bulls, horses, buildings, and machinery)	3,382
TOTAL	$7,472

Cash Expenses

Purchased feed	$ 584
Range fees	346
Taxes (real estate & personal property)	672
Repairs (machinery & buildings)	1,164
Fuel, oil, and grease	924
Hired labor	1,484
Insurance	150
Water	0
Veterinary supplies	150
Misc. (telephone, electricity, etc.)	310
TOTAL	$5,784

Summary

Gross ranch income	$13,900
(less) cash expenses	- 5,784
Net cash income	$ 8,116
(less) noncash expenses	- 7,472
Net return to operator's management and family labor	$ 644

This indicates that the rancher is accepting a low wage for his management and his and the family's labor. This is fairly common.

If this ranch were free of indebtedness, the owner would pay the noncash expenses to himself. Thus, funds available for family living and investing would be:

Return to operator labor & management	$ 644
Interest on investment	3,916
Interest on working capital	174
Depreciation	3,382
Total available for family living & investing	$8,116

However, many ranchers obtain working capital on a production loan and have a real estate loan. A typical real estate debt would be $33,000. Thus, interest on working capital and part of the interest on investment would become cash costs paid to creditors and reduce the income available for family living and investing. A ranch with such debts would yield the following:

Return to operator	
Interest on investment ($3,916-$1,650)	$ 644
Interest on working capital ($174-$174)	2,266
Depreciation	0
	3,382
Total available for family living & investing	$6,292

It should be noted that to maintain ranch capital, the depreciation fund should be reinvested, so that the net amount available for family living would be $2,910 ($6,292-$3,382). In such circumstances a ranch family either accepts a low level of living or gradually depletes the ranch capital by using depreciation funds for family living and letting ranch improvements and equipment decline without replacement. Both situations are faily common on small-sized ranches.

The above budget uses estimated 1960 market prices for land values. This is valid on an opportunity cost basis. However, many ranchers with small to medium-sized firms have lower land costs because they inherited their ranch or purchased it several years ago at prices considerably below current levels. Such ranchers are more likely to be debt-free than those who purchased in recent years. It is commonplace in the West that the most important factor in ranch financial success is the time of purchase of the ranch.

Opportunities for improving ranch income may exist in: (a) Increasing the size of the ranch business and spreading fixed costs over more units of output, (b) Improving productivity of owned lands, (c) Improving herd management to raise the level of livestock output. (d) Engaging in cooperative improvement of the Federal range, and (e) Various combinations of the foregoing.

Model Ranch II, Burley Grazing District

With a basic breeding herd of 200 cows and heifers, this ranch uses fair quality bulls at a ratio of 1 bull: 25 cows. Bulls are used for 4 years. Breeding is on a year-long basis. The calf crop weaned is 70 percent of all cows and heifers in the breeding herd. Gross replacement of the cow herd is at 20 percent. Death losses are about 5 percent. Replacement heifers are placed directly into the cow herd and consequently bred to drop their first calf when about 2 years old. Calves are sold through a local auction ring in small lots throughout late fall and winter as they reach an average weight of 425 lbs.

The long-run average gross income of this ranch is as follows:

	Average Weight	Average Price	
30 cull cows & heifers	900 lbs.	$13.50	$ 3,645.00
70 steer calves	436 lbs.	21.50	6,564.25
28 heifer calves	400 lbs.	19.00	2,128.00
			$12,337.25

Totals 68,659 lbs. of beef
Average price $17.97

Land owned:

200 acres of native meadow hayland yielding	1-1/4 tons/acre
25 acres of native meadow pasture yielding	3 AUM/acre
20 acres of alfalfa yielding	3 tons/acre
640 acres of fair to poor native range with capacity of	15 acres/AUM
5 acres of farmstead, corrals, etc.	

Labor used:

Family labor accomplishes most of the ranch work, but one man is hired from April through October.

Horses:

This ranch has 4 horses; 2 saddle horses, and one team of draft animals.

Buildings and improvements:

A shop, machine shed, barn, granary, stock shelter, corral, well and pump on the farmstead, 15 miles of fence, feed racks, tanks, and troughs.

Machinery and equipment:

Two tractors, pickup truck, 50% farm share of family auto, mower, side delivery rake, self-powered baler, bale loader, ditcher, 2 wagons, post hole auger, plow, harrow, manure spreader, manure loader, feed grinder, branding irons, veterinary equipment, gas tank and pump, saddles and harness, and various small tools and equipment.

Feed requirements and sources:

This ranch requires a total of 2,544 AUM's of feed per year. Prior to adjudication it holds a permit for 1,044 AUM's of feed on the Federal range. This permit is for:

165 cattle from April 1 to April 30
208 cattle from May 1 to June 15
91 cattle from June 15 to September 15
208 cattle from September 16 to October 15
43 cattle from October 16 to December 15

This license was based on ranch commensurability and use made before passage of the Taylor Grazing Act when competition for unregulated ranges required early turn-out with large numbers of cattle. Since then, without the pressure of competition, ranchers have not found it profitable to turn hungry cattle out on ranges not yet producing usable feed. Similarly, ranchers commonly remove their cattle from dry Federal range and place them on better feed on the ranch before their license requires it. Consequently, though the license is for 1,044 AUM's between April 1 and December 15, actual use of the Federal range is 876 AUM's between April 15 and October 15.

In terms of permitted use this ranch appears to obtain 41 percent of its annual feed from the Federal range; in actuality the percentage is 34. An additional 12 percent of the year's feed is obtained from a nearby national forest on a permit for 104 cattle from June 15 to September 15 (312 AUM's). The balance of the feed (54%; 1,356 AUM's) is provided by ranch resources - winter feed, meadow pasture, owned range, and crop aftermath. Most of the feed used in winter is produced on the ranch; barley, oats, and salt are purchased. Stock are fed hay for an average of 105 days between mid-December and early to mid-April.

Ranch investments, expenses and income are summarized as follows:

Long-run average investments

Land (1960 market value)	$23,950
Breeding herd	26,200
Horses	800
Buildings and improvements	15,565
Machinery and equipment	10,442
TOTAL	$76,957

Noncash expenses

Interest (5%) on long-run investment	$ 3,848
Interest (6%) on average working capital	169
Depreciation (on bulls, horse, buildings and machinery)	3,124
TOTAL	$ 7,141

Cash expenses

Purchased feed	$ 250
Range fees, BLM	198
Range fees, Forest Service	175
Taxes (real estate & personal property)	669
Repairs (machinery & buildings)	1,303
Fuel, oil, and grease	663
Hired labor	1,484
Insurance	150
Water	75
Veterinary supplies	150
Misc.(telephone, electricity, etc.)	530
TOTAL	$ 5,647

Summary

Gross ranch income	$12,338
(less) cash expenses	- 5,647
Net cash income	$ 6,691
(less) noncash expenses	- 7,141
Net return to operator's management and family labor	$ - 450

This indicates that the rancher and his family are accepting a negative return for their labor and management. In effect, they are paying for the privilege of ranching. This is fairly common among ranchers.

If the ranch were free of indebtedness, the owner would pay the noncash expenses to himself. Thus, funds available for family living and investing would be:

Return to operator labor & management	$- 450
Interest on investment	3,848
Interest on working capital	169
Depreciation	3,124
TOTAL available for family living and investing	$ 6,691

However, more commonly, the ranch would obtain working capital on a production loan and be carrying a real estate debt. A typical real estate debt on a 200-cow outfit would be about $33,000. Thus, interest on working capital and part of the interest on investment would become cash costs paid to creditors

and reduce income available for family living and investing. A ranch with such debts would yield the following:

Return to operator	$ - 450
Interest on investment ($3,843-$1,650)	2,198
Interest on working capital ($169-$169)	0
Depreciation	3,124
TOTAL available for family living and investing	$ 4,872

To properly maintain the ranch as a business firm, the depreciation fund should be reinvested in the ranch, so that the net amount available for family living would be $1,748 ($4,872-$3,124). Under such circumstances a ranch family either accepts a low level of living or gradually impairs ranch capital by using depreciation funds for current consumption while letting ranch improvements and equipment decline without replacement. Both situations are common on small-sized ranches.

The above budget uses estimated 1960 market prices for land investment values. This is valid on an opportunity cost basis. However, many ranchers with small to medium-sized firms have lower land costs because they inherited their ranch or purchased it several years ago at prices considerably below current levels. Such ranchers are more likely to be debt free than those who purchased in recent years. It is commonplace in the West that the most important factor in ranch financial success is the time of purchase of the ranch.

Opportunities for improving ranch income may exist in: (a) Increasing the size of the business and spreading fixed costs over more units of output, (b) Improving productivity of owned lands, (c) Improving herd management to raise the level of livestock output, (d) Engaging in cooperative improvement of the Federal range, and (e) Various combinations of the foregoing.

Model Ranch III, Burley District

Models I and II have been devised to illustrate the long-term economic position of ranchers using common production practices. The question might be asked, "How do these common situations compare with those of ranchers making use of more efficient practices?" Model III illustrates, for the Burley district, a small ranch, organized similar to ranch Model II, but using better management.

Model III differs from Model II as follows: (a) Better bulls are used for an average of only 3 years instead of 4, and the bull-cow ratio is 1:20 rather than 1:25, (b) Breeding is seasonal rather than year-long, (c) Replacement heifers are bred to drop their first calf at about age 3 rather than age 2. This helps boost calf crops and cut death losses. It also calls for more feed resources as the total cattle herd is enlarged by the addition of replacement heifers, (d) Calf crop is 85 percent instead of 70 percent, (e) Death losses are down to 3 percent from 5 percent, (f) The average sale weight of all calves is up from 425 pounds to 450 pounds.

The long-run average gross income of this ranch is as follows:

34 cull cows	900 lbs.	$13.50	$ 4,131.00
85 steer calves	460 lbs.	21.50	8,406.50
43 heifer calves	430 lbs.	19.00	3,513.10
			$16,050.60

TOTALS 88,190 lbs. of beef
Average price is $18.20

Land owned:

220 acres of native meadow hayland yielding	1 1/4 tons/acre
25 acres of alfalfa yielding	3 tons/acre
30 acres of native meadow pasture yielding	3 AUM/acre
780 acres of fair to poor native range with capacity of	15 acres/AUM
5 acres of farmstead, corrals, etc.	

Labor used:

This ranch operates almost entirely with family labor, hiring one man from April through October.

Horses:

The same as Model II.

Buildings and improvements:

The same as Model II.

Machinery and equipment:

The same as Model II. However, due to increased number of cattle and larger acreages of cropland, total costs of operating the machinery are higher.

Feed requirements and sources:

This ranch requires a total of 3,048 AUM's of feed per year. Prior to adjudication it holds a permit for 1,229 AUM's on the Federal range. This permit is for:

198 cattle from April 1 to April 30
250 cattle from May 1 to June 15
125 cattle from June 16 to September 15
250 cattle from September 16 to October 15
31 cattle from October 16 to November 15

As with Models I and II the license was based on ranch commensurability and has not been adjusted since passage of the Taylor Grazing Act. Actual use is less than permitted use due to later turn-out and earlier gathering. Therefore, although the license is for 1,229 AUM's between April 1 and November 15, actual use of the Federal range is for 974 AUM's between April 15 and October 15.

In terms of permitted use, ranch III appears to obtain 40 percent of its annual feed from the Federal range; in actuality the percentage is 32. An additional 12 percent of the year's feed comes from a nearby national forest on a permit for 125 cattle from June 15 to September 15. The remaining 56 percent of the feed comes from base property and purchased feeds.

Ranch investments, expenses and income are summarized as follows:

Long-run average investments

Land (1960 market value)	$27,450
Breeding herd	30,761
Horses	800
Buildings and improvements	15,565
Machinery and equipment	10,442
TOTAL	$85,018

Noncash expenses

Interest (5%) on long-run investment	$ 4,251
Interest (6%) on average working capital	156
Depreciation (on bulls, horses, buildings, and machinery)	3,734
TOTAL	$ 8,141

Cash expenses

Purchased feed	$ 452
Range fees, BLM	234
Range fees, Forest Service	210
Taxes (real estate and personal property)	746
Repairs (machinery and buildings)	1,303
Fuel, oil and grease	674
Hired labor	1,484
Insurance	150
Water	90
Veterinary supplies	150
Misc. (telephone, electricity, etc.)	560
TOTAL	$ 6,053

Summary

Gross ranch income	$16,051
(less) cash expenses	- 5,053
Net cash income	$ 9,998
(less) noncash expenses	- 8,141
Net return to operator's management and family labor	$ 1,857

Cash available for family living and investing if the ranch is free of indebtedness:

Return to operator	$ 1,857
Interest on investment	4,251
Interest on working capital	156
Depreciation	3,734
TOTAL	$ 9,998

If the depreciation fund is reinvested in the ranch, as it should be to maintain ranch capital, the net amount available for family living and investing would be $6,264 ($9,998-$3,734).

Comparison of Models II and III

Item	Model II (Average practices)	Model III (Better management)
Management practices		
Bulls	Fair quality used 4 years 1 bull/25 cows	Good quality used 3 years 1 bull/20 cows
Breeding	yearlong replacements bred as yearlings	seasonal replacements bred as 2 year olds
Death losses	about 5%	about 3%
Feeding	(little basic difference) (good practices on both ranches)	
Resources used		
Private range	640 acres	780 acres
Meadow and crop	245 acres	275 acres
Hired labor	(no difference)	
Horses	(no difference)	
Machinery and equipment	(no difference)	
Buildings and improvements	(no difference)	
Federal range (permitted use)	1,044 AUM's	1,229 AUM's
Federal range (actual use)	876 AUM's	974 AUM's
Average long-run investment	$76,957	$85,018
Production		
Calf crop	70%	85%
Average weight of calves	425 lbs.	450 lbs.
Beef sales	68,650 lbs.	88,190 lbs.
Expenses		
Cash expenses	$ 5,647	$ 6,053
Noncash expenses	$ 7,141	$ 8,141

Item	Model II (Average practices)	Model III (Better management)
Income		
Gross ranch income	$12,338	$16,051
Net cash income	$ 6,691	$ 9,998
Cash for family living and investing (debt free basis)	$ 6,691	$ 9,998
Return to operator labor and mgmt.	$ - 450	$ 1,857

Thus, with better management practices and a larger investment in owned land resources, the same basic breeding herd returns $2,307 more to the operator. The improved income situation is due to spreading fixed costs over more units of production and selling more beef at a better average price. Average price is higher for Model III as total beef includes proportionately more calf meat and less cow meat.

Adjudication of Federal ranges used by ranches I and II. With the average long-run economic situation of the model ranches estimated, it is possible to examine the effects of range adjudication. Range privilege reductions were applied to licenses held by ranches I and II that are typical of those actually applied in adjudicated units of the Vale and Burley Grazing Districts.

Due largely to problems of semantics, even the initial impact of grazing reductions are commonly misunderstood. Frequently it is assumed that a reported reduction of 50 percent, for example, means that the affected rancher is in danger of losing half of his basic breeding herd. In actuality this almost never is the case since (a) commonly some of the licensed privilege is not actually used, and (b) permits are issued, reduced, and increased in terms of animal-unit-months (AUM's). The AUM is a two-dimensional concept involving both numbers of animals and time on the range. Consequently reductions in permitted use of the Federal range often include some privileges not actually used and usually are arranged in terms of time as well as livestock numbers. The time element is frequently more important to proper use of range vegetation than is numbers of animals. Since the Federal range usually supplies only part of the total annual feed, privilege reductions are not reflected proportionately in the breeding herd. These principles are illustrated below.

Ranch model I (Oregon) was subjected to a reduction of 40 percent in permitted use. Detailed analysis of the range operation and yearlong feed supplies revealed the following:

Permitted use of the Federal range prior to adjudication	1,820 AUM's
Reduction of 40% in permitted use	- 728 AUM's
Permitted use of the Federal range after adjudication	1,092 AUM's
Actual use of the Federal range prior to adjudication (476 AUM's permitted but not actually used)	1,344 AUM's
Permitted use of the Federal range after adjudication	1,092 AUM's
Reduction in actual use	- 252 AUM's
Percent reduction in actual use	19%

Thus the actual impact of reduced privileges is only 19 percent rather than 40 percent.

In working out the details of adjusted range use, considerations of both time and numbers of cattle arose. The net deficit of feed faced by the rancher as a result of the reduction is as follows:

Time	No. of cattle removed from BLM ranges	Feed deficit resulting from the reduction
June 1 to August 22	30	82 AUM's
August 23 to August 31	149	37 AUM's
September 1 to September 15	89	45 AUM's
September 16 to September 30	150	75 AUM's
October 1 to October 15	25	13 AUM's
	Total feed deficit	252 AUM's

Details of the adjustment in range use are shown in Table 10 and Figure 6. These illustrate the interaction of cattle numbers and time of use.

Table 10 Permitted use and actual use of the Federal range prior to adjudication, and the effects of adjudication on the feed supply of model ranch I (Oregon).

Time		Permitted use before adjudication		Actual use before adjudication		Permitted use not used prior to adjudication		Permitted use after adjudication		Changes due to adjudication: In Permitted use		Changes due to adjudication: In actual use	
Dates	Months	AUs	AUMs	AUs	AUMs	AUs	AUMs	AUs	AUMs	AUs	AUMs	AUs	AUMs
Apr. 1-Apr. 8	¼	260	65	0	0	260	65	0	0	-260	65	0	0
Apr.9-Apr.15	¼	260	65	115	31	145	34	115	31	-145	34	0	0
Apr.16-May 31	1½	260	390	230	345	30	45	230	345	- 30	45	0	0
June 1-Aug.15	2½	260	650	260	650	0	0	230	575	- 30	75	- 30	75
Aug.16-Aug.22	¼	260	65	260	65	0	0	230	58	- 30	7	- 30	7
Aug.23-Aug.30	¼	260	65	260	65	0	0	111	28	-149	37	-149	37
Sept.1-Sept.15	½	260	130	200	100	60	30	111	55	-149	75	- 89	45
Sept.16-Oct.1	½	260	130	150	75	110	55	0	0	-260	130	-150	75
Oct. 1-Oct.15	½	260	130	25	13	235	117	0	0	-260	130	- 25	13
Oct. 16-Nov.1	½	260	130	0	0	260	130	0	0	-260	130	0	0
Totals		XXX	1,820	XXX	1,344	XXX	476	XXX	1,092	XXX	-728	XXX	-252

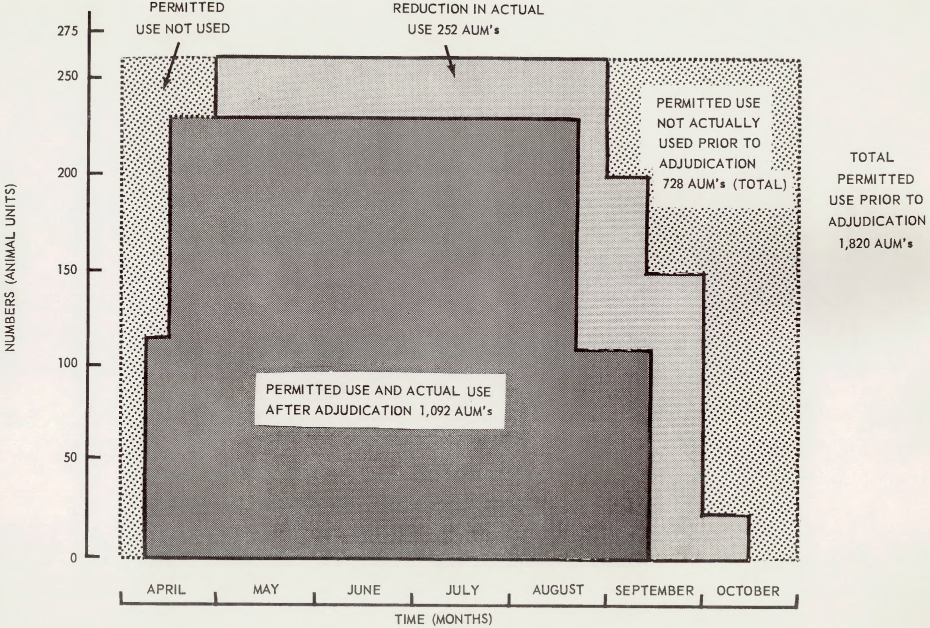

FIGURE 6. EFFECTS OF ADJUDICATION ON PERMITTED USE AND ACTUAL USE, RANCH MODEL I (OREGON)

Ranch model II (Idaho) was subjected to a reduction of 43 percent in its permitted use. Detailed analysis of the range operation and yearlong feed supplies revealed the following:

Permitted use of the Federal range prior to adjudication	1,044 AUM's
Reduction of 43% in permitted use	- 450 AUM's
Permitted use of the Federal range after adjudication	594 AUM's
Actual use of the Federal range prior to adjudication (168 AUM's permitted but not actually used)	876 AUM's
Permitted use of the Federal range after adjudication	594 AUM's
Reduction in actual use	- 282 AUM's
Percent reduction in actual use	32%

Thus the actual impact of reduced privileges is only 32 percent rather than 43 percent.

In working out the details of adjusted range use, considerations of both time and numbers of cattle arose. The net deficit of feed faced by the rancher as a result of the reduction is as follows:

Time	No. of cattle removed from BLM ranges	Feed deficit resulting from the reduction
April 15 to April 30	65	33 AUM's
May 1 to May 14	58	29 AUM's
May 15 to September 15	28	112 AUM's
September 16 to October 15	108	108 AUM's
	Total feed deficit	282 AUM's

The details of the range use adjustment, in terms of time of use and numbers of animals are shown in Table 11 and Figure 7.

Table 11 Permitted use and actual use of the Federal range prior to adjudication, and the effects of adjudication on the feed supply of model ranch II (Idaho).

Time		Permitted use before adjudication		Actual use before adjudication		Permitted use not used prior to adjudication		Permitted use after adjudication		Changes due to adjudication			
										In permitted use		In actual use	
Dates	Months	AUs	AUMs	AUs	AUMs	AUs	AUMs	AUs	AUMs	AUs	AUMs	AUs	AUMs
Apr. 1- Apr.15	½	165	82	0	0	165	82	0	0	-165	82	0	0
Apr. 16-Apr.30	½	165	83	165	83	0	0	100	50	- 65	33	- 65	33
May 1 - May 15	½	208	104	208	104	0	0	150	75	- 58	29	- 58	29
May 16-June 15	1	208	208	208	208	0	0	180	180	- 28	28	- 28	28
June 16-Sept.15	3	91	273	91	273	0	0	63	189	- 28	84	- 28	84
Sept.16-Oct.15	1	208	208	208	208	0	0	100	100	-108	108	-108	108
Oct. 16-Dec.15	2	43	86	0	0	43	86	0	0	- 43	86	0	0
Totals		XXX	1,044	XXX	876	XXX	168	XXX	594	XXX	-450	XXX	-282

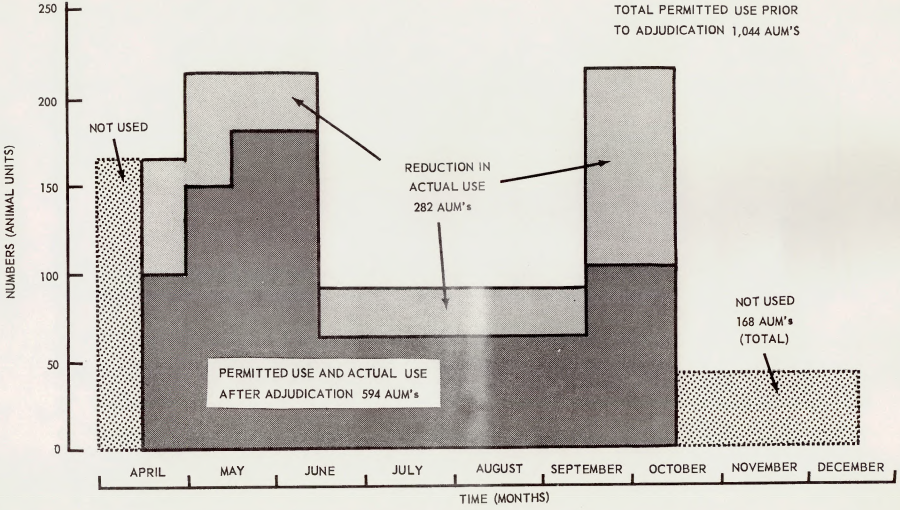

FIGURE 7. EFFECTS OF ADJUDICATION ON PERMITTED USE AND ACTUAL USE, RANCH MODEL II (IDAHO)

Alternative Feed Sources

In most cases of adjudication, ranchers are faced with a basic problem of finding substitute feeds for those actually displaced. This is a complex economic problem with both short-run and long-run implications.

Grazing use of the Federal range at minimum fees always has been a least-cost source of AUM's. Thus the apparent immediate threat is that of increased cash costs to maintain a current level of production. However, over-grazed Federal range in need of adjudication, is a resource of low productivity as well as low cost. Consequently, substitution of more costly and better quality feeds for AUM's no longer available from the range may increase returns more than it increases costs. The economic alternatives open to ranchers with reduced range privileges are several. The problem is to determine the most profitable alternative within reach of practical attainment. The optimum solution is not the same for all ranchers in any locality. The problem faced by each ranch is peculiarly its own, and each ranch has its own set of economic alternatives that are conditioned by its geographical location, its organization, and its operation.

The main general alternatives open to operators of Ranch Model I and Ranch Model II may be classified as follows:

A. Alternatives that may be effected in a short period of time:

   I. Reduce the size of the basic breeding herd.

   II. Buy additional harvested feeds, rent grazing on pastures, ranges, or cropland.

B. Alternatives requiring an intermediate time period (a few weeks to several months) for effectuation:

   III. Buy Federal range privileges from other ranchers.

   IV. Buy additional range, crop, and/or pasture land.

C. Alternatives requiring a longer time period (2 to 5 years) for effectuation:

   V. Improve presently owned land resources.

VI. Improve the Federal range in cooperation with the Bureau of Land Management.

VII. Improve livestock production practices.

These alternatives may be adopted in a wide range of possible combinations.

To further explore and illustrate the effects of adjudication on small-sized ranches, the above alternatives were examined as they might apply to Model Ranch II (Idaho). Results of the analysis are given below.

Alternative I - reduce the size of the basic herd. One possible course of action for this rancher is to contract the size of his operation rather than replace the 282 AUM's no longer available from BLM range. The most critical feed deficit is for 28 cattle from May 15 to September 15 (112 AUM's). By reducing the breeding herd by 28 cows, this deficit period could be avoided. Also the remainder of the herd could be fed without buying or renting any additional feed or pasture. Some ranch-produced hay would become surplus and could be sold.

Analysis of this course of action reveals the following:

Item	Change in total costs	Change in total returns
Sale of surplus hay		$ + 327
Reduction in grazing fees paid	$ - 86	
Reduced costs of production, 28 cows	-230	
Loss of production, 28 cows		-1,727
Totals	$ -316	$ -1,400

Net change in return to operator $ - 1,084

The loss of income far exceeds the reduction in costs. Since fixed costs are such a high proportion of total ranching costs, reducing the breeding herd, and cutting variable costs, does little to reduce total costs.

Alternative II - purchasing feed to meet the deficit while maintaining a constant herd size. The 33 AUM deficit in April could be met with locally purchased hay. The need for 141 AUM's in late spring and summer might be taken care of by renting irrigated pasture. The mid-September-mid-October deficit of 108 AUM's might be filled by renting grain-stubble pasture. Marketing practices would be altered to sell cull cows earlier in the fall to reduce cash costs for purchased feeds. Also the rancher would be careful to use the more expensive, better quality, feeds with animals most likely to produce marketable gains.

The estimated results of adopting this course of action are:

Item	Change in total costs	Change in total returns
Reduction in grazing fees paid	$ - 86	$
Purchase of hay for spring use	+ 195	
Rental of summer pasture	+ 560	
Rental of fall stubble pasture	+ 195	
Additional beef production on summer pasture		+ 529
Additional beef production on fall stubbel		+ 183
Totals	$ + 864	$ + 712

Net change in return to operator $ - 152

Although costs have risen considerably, returns have risen also, and nearly cover the additional costs.

Alternative III -- buying Federal range privileges from other ranchers while maintaining a constant herd. Range privileges might be available for purchase. If so, they could be acquired, at the going market price, to meet the need for late spring, summer and early fall feed. Acquisition of additional BIM range privileges would not likely induce any major changes in production practices or output.

Item	Change in total costs	Change in total returns
Interest on investment in new privilege	$ + 141	$
Reduction in old fees paid (450 AUM's)	- 86	
Fees paid on new privilege (282 AUM's)	+ 54	
Totals	$ 109	$ 0

Net change in return to operator: $ - 109

This alternative would require a new long-term investment of $2,820 for 282 AUM's of privilege at $10 per AUM.

Alternative IV - buying enough land to produce the hay needed in spring and the additional summer-fall grazing needed. If the rancher buys land of the same productivity as that he already owns, it would require an additional 12 acres of alfalfa hayland and 3,555 acres of native rangeland. These purchasers would require a new long-term investment of $20,175. It is not likely that major changes in ranch output would be induced by such an expansion of land ownership, since range productivity would be low.Estimated changes in annual costs and returns are as follows:

Item	Change in total costs	Change in total returns
Reduction in grazing fees paid	$- 86	$
Interest on investment in additional land	+ 1,009	
Taxes on additional land	+ 238	
Totals	$+ 1,341	$ 0

Net change in return to operator $ - 1,341

Alternative V - improvement of owned land resources. By planting crested wheatgrass on the 640 acres of owned low-quality native range, the rancher could meet all his needs for additional feed except for 28 cattle during mid-June to mid-September (84 AUM's). Range capacity could be raised from 15 acres/AUM to 3 acres/AUM. The course of action summarized below includes seeding the 640 acres of range, and renting 84 AUM's of summer pasture (as in Alternative II). Such development would require about 3 years and an estimated initial investment of $4,640 ($7.25/acre). The rancher would have to provide only $2,720 (59 percent) of this if his local ASC Committee has sufficient funds available and approves his application for ACP cost-sharing. Since BLM permittees may take up to 3 years to adjust to a privilege reduction, the rancher's costs of not using his seeding during establishment would be minimized by coordinating his plans with the BLM. Use of the seeding and rented pasture could be expected to increase beef output. Analysis of this course of action reveals the following estimates:

Item	Change in total costs	Change in total returns
First year after planting (fall planting)		
Hay to cover 43 AUM's displaced by seeding	$ + 258	$
Interest on $2,720 invested in seeding	+ 136	
Totals	$ + 394	$ 0
Net change in return to operator	$ - 394	
Second year after planting (fall use made of new grass; use shifted from BLM land)		
Hay to cover AUM's displaced by seeding	$ + 258	$
Interest on investment in seeding	+ 136	
Reduction in grazing fees paid	- 21	
Increased beef production due to fall use of seeding		+ 340
Totals	$ + 373	$ + 340
Net change in return to operator	$ - 33	
Subsequent years (seeding used spring and fall; pasture rented in summer)		
Reduction in grazing fees paid	$ - 86	$
Rental of summer pasture	+420	
Amortized investment in seeding	+218	
Increased beef production due to summer pasture		+ 397
Increased beef production due to spring use of seeding		+ 836
Increased beef production due to fall use of seeding		+ 340
Totals	$ + 552	$ +1,573
Net change in return to operator	$ + 1,021	

Although the rancher would lose $394 and $33 of income the two years before the seeding is ready, he would gain an additional $1,021 per year in income every year after that. Increased returns have exceeded increased costs by a substantial amount.

Alternative VI - improvement of part of the rancher's Federal range allotment in cooperation with the Bureau of Land Management. Such a program might be identical with that illustrated in Alternative V, except that the seeded land would be part of the Federal range rather than private range. The rancher would not be eligible for ACP cost-sharing. His share of seeding costs would be determined by agreement with BLM; typically it might be about $1.50 per acre, an investment of $960. A summary follows:

Item	Change in total costs	Change in total returns
First year after planting		
Hay to cover 43 AUM's displaced by seeding	$ + 258	$
Interest on $960 invested in seeding	+ 48	
Reduction in grazing fee paid (-43 AUM's)	- 8	
Totals	$ + 298	$ 0
Net change in return to operator	$ - 298	
Second year after planting (fall use of new grass)		
Hay to cover 43 AUM's displaced	$ + 258	
Interest on investment in seeding	+ 48	
Reduction in grazing fees paid	- 8	
Increased beef production due to fall use of seeding		$ + 340
Totals	$ + 298	$ + 340
Net change in return to operator		$ + 42

Item	Change in total costs	Change in total returns
Subsequent years		
Rental of summer pasture	$ + 420	$
Amortized investment in seeding	+ 77	
Increased beef production due to summer pasture		+ 397
Increased beef production due to spring use of seeding		+ 836
Increased beef production due to fall use of seeding		+ 340
Totals	$ + 567	+ 1,573

Net change in return to operator $ + 1,006

In this case the rancher would invest less than if he seeded his own land, and he would forego $171 fewer dollars of income while waiting for the grass to become ready for use. Gross income would increase the same as if owned land were improved, but annual costs would rise about the same, so that average annual net income would be about the same. Nearly the same income would be earned with a much smaller investment.

Alternative VII - improving herd management and livestock production practices. The production efficiency of this ranch is only average. Percentage calf crop and average weight of calves sold can be increased. It would be possible even to earn a higher net income with a smaller herd. To improve calf crop and sale weights would require more bulls of better quality, a change in breeding practices so that replacement heifers are kept separate from the bulls until of sufficient weight to be bred, and shortening of the breeding season. Death losses of heifers could be expected to decline. Calf crop would go up from 70 percent to 85 percent. Average calf weights could rise from 400 lbs. to 425 lbs.

Analysis of such management improvements and ranch resources reveals that this course of action cannot be followed without concurrently increasing the total ranch feed supply. Thus, the rancher faces a complex problem of improving output and income by improving herd management and increasing feed production while taking a reduction in use of the Federal range. For this ranch a 3-year program was analyzed that combined:

(a) Gradual reduction of the cow herd from 200 to 170.
(b) Gradual establishment of a herd of 35 replacement heifers.
(c) Increasing the bull herd from 8 to 9 and gradually upgrading the quality ofthe bull herd.
(d) Shortening the breeding season.
(e) Improving 40 acres of native meadow hayland by reorganizing the irrigation and planting improved grasses; 20 acres to be used for hay, 20 acres for pasture.
(f) Planting 640 acres of owned range to crested wheatgrass (as in Alternative V).

After accomplishment of the management improvement program, average annual gross ranch income would be:

110 calves @ 425 lbs. and 21¢	$ 9,818
29 cull cows @ 900 lbs. and 13-1/2¢	3,523
Total	$13,341

Gross receipts have increased by $1,003 as a result of an increase in production of 4,371 lbs. of beef.

Detailed analysis of this 3-year program reveals the following:

The rancher would have to invest $4,400 in seeding the range and improving the 40 acres of meadow. Also he would increase his average long-run investment in the breeding herd by $463. During the 2 years of waiting for the seeded range to mature, he would lose $448 buying alternative feeds and paying interest on his investment in the grass. However, this would be more than offset by a gain in income of $1,231 during the 3 years of reorganizing the breeding herd. Use of a nurse crop in the meadow improvement program would preclude the need to buy extra feed during establishment of the new grass.

Changes in average long-run investments*

Addition of replacement heifers	$ + 3,780
Reduction in number of cows	- 3,750
Addition of 1 bull, upgrading 8 bulls	+ 433
Total	$ + 463

(*New investments in seeding and meadow improvement are accounted for by amortization.)

Summary of changes in annual costs and returns after the adjustment is fully effected.

Item	Change in total costs	Change in total returns
Interest on added heifers	$ + 189	
Interest on cows cut from herd	- 188	
Interest on new and better bulls	+ 22	
Additional depreciation and death loss on bull herd	+ 503	
Annual amortization of seeding	+ 218	
Taxes on added heifers	+ 42	
Taxes on cows cut from herd	- 36	
Taxes on added bull	+ 3	
Reduction in grazing fees paid	- 86	
Annual cost of improved meadow*	+ 560	
Increased production due to management improvement		$ + 1,003
Increased production due to spring use of seeding		+ 836
Increased production due to fall use of seeding		+ 340
Increased production due to use of 10 acres improved pasture		+ 630
Totals	$ +1,227	$ + 2,809

Net change in return to operator $ + 1,582

(Also note a net gain of $783 during the 3 year adjustment period.)

*Includes amortized investment and increased operating expenses.

A comparison of the seven alternative courses of action is found in Table 12.

Table 12. Comparison of seven alternative courses of action by a Southern Idaho rancher (Model II) whose BLM range privileges are reduced

	Alternative	Change in total annual costs	Change in total annual returns	Net Change in Operator's Annual Income	Requirements for new capital investment	Requirement for additional annual operating capital
		(Dollars)	(Dollars)	(Dollars)	(Dollars)	(Dollars)
I.	Reduce the basic breeding herd by 28 cows.	- 316	- 1,400	- 1,084	- 3,500	- 315
II.	Purchase feed and forage; maintain herd size.	+ 864	+ 712	- 152	0	+ 864
III.	Buy additional Federal range privileges (282 AUMs).	+ 109	0	- 109	- 2,820	- 32
IV.	Buy additional hayland and rangeland of quality and productivity similar to that already owned. (12 acres alfalfa; 3,555 acres range).	+ 1,341	0	- 1,341	+ 20,175	+ 332
V.	Improve owned land. Seed 640 acres to crested wheatgrass; rent 84 AUMs of summer pasture.	+ 552	+ 1,573	+ 1,021 ($427 lost during 3 years of establishment)	+ 2,720	+ 334
VI.	Cooperative improvement of 640 acres of Federal range by seeding to crested wheatgrass; rental of 84 AUMs of summer pasture.	+ 567	+ 1,573	+ 1,006 ($256 lost during 3 years of establishment)	+ 960	+ 404
VII.	Improvement of livestock management and production. Includes cutting cow herd from 200 to 170, adding one bull, upgrading the bull herd, breeding 2-yr. old heifers instead of yearlings, shortening the breeding season, improving 40 acres of meadow land and seeding 640 acres of range to crested wheatgrass.	+ 1,227	+ 2,809	+ 1,582	+ 4,836	+ 483

Comparisons among the seven alternatives indicate that V, improving owned land; VI, improving the Federal range; and VII, improving livestock management and owned land all may result in larger net returns. However, each of these requires considerable new capital investment; nearly $5,000 for VII, nearly $3,000 for V, and just under $1,000 for VI.

Alternatives I through IV would result in net losses of from about $100 to as much as $1,300 per year. The largest net loss would result from alternative IV, purchase of additional hayland and rangeland. This alternative also would require more investment capital (over $20,000) than any of the other six. The next least profitable alternative is I, reducing the herd by 28 cows. The alternative resulting in the least loss ($ - 100 per year) is III, buying additional range privileges. Such a purchase would require nearly $3,000 of new investment. Maintaining the herd by purchasing additional hay and renting pasture and stubble, alternative II, would result in a loss of only $150 per year; it would not require additional investment; but it would require additional operating capital.

The rancher's need for long-term capital is an important focal point in the adjustment problem. Ranchers commonly obtain operating capital annually from local banks or cooperatively owned and operated Production Credit Associations; many of them also have outstanding long-term real estate loans with insurance companies, cooperative Federal Land Banks, or other private sources. Many ranchers already are using all the credit available to them. The need for additional long-term and short-term credit to enable ranchers to adjust profitably to adjudication of BLM privileges may be a serious problem.

The problem of slow adoption of better range management and range improvement practices due to lack of owned or borrowable capital is not new. In 1954 R. B. Peck1/, ranch consultant, discussed this problem and proposed a program of long-term lending for range improvements under a privately financed, government-insured arrangement. No such development has taken place.

1/ Peck, R. B. The Stockman's Need for Longtime Credit for Range Development. Journal of Range Management 7 (4): 162-3. July 1954.

Comparisons among the seven alternatives indicate that V, including owned land; VI, improving the Federal ranges and VII, improving livestock management and owned land all may result in larger net returns. However, each of these required considerable new capital investment: nearly $21,000 for VII, nearly $4,000 for V, and just under $1,000 for VI.

Alternatives I through IV would result in net losses of from about $100 to as much as $1,300 per year. The largest net loss would result from alternative IV, purchase of additional hayland and rangeland. This alternative also would require more investment capital (over $20,000) than any of the other ways. The next least profitable alternative is I, reducing the herd by 20 cows. The alternative resulting in the least loss ($ - 106 per year) is III, buying additional range privileges. Such a purchase would require nearly $1,800 of new investment. Maintaining the herd by purchasing additional hay and renting pasture and stubble, alternative II, would result in a loss of only $150 per year; it would not require additional investment; but it would require additional operating capital.

The rancher's need for long-term capital is an important focal point in the adjustment problem. Ranchers commonly obtain operating capital annually from local banks or cooperatively owned and operated Production Credit Associations; many of them also have outstanding, long-term real estate loans with insurance companies, cooperative Federal Land Banks, or other private sources. Many ranchers already are using all the credit available to them. The need for additional long term and good-term credit to enable ranchers to adjust profitably to adjudication of BLM privileges may be a serious problem.

The problem of slow adoption of better range management and range improvement practices due to lack of owned or borrowable capital is not new. In 1954 R. B. Peck 1/, ranch consultant, discussed this problem and proposed a program of long-term lending for range improvements under a privately financed, government-insured arrangement. No such development has taken place.

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Conclusions:

Preliminary economic analysis of alternative courses of action open to the operator of ranch model II (Idaho) leads to the following conclusions:

1. The impact of Federal range privilege reduction as a result of range adjudication is financial. The rancher is faced with feed shortages which must be filled with alternative feeds, all of which are more expensive than Federal range.

2. Many alternative feeds are not only more expensive but of better quality and result in increased income as well as increased cost. Alternative feed sources can result in a net financial gain for the rancher.

3. The most profitable courses of action require additional capital investment, reorganization of ranch resources, adjustments in ranch operations, and a period of 2 or 3 years in which to adjust.

4. The most profitable alternatives often can be adopted without increases in labor resources, machinery and equipment, or improvements. The primary restrictions on adjustments are land (investment capital) and operating capital.

5. The most profitable alternative studied involved a slight reduction of the breeding herd combined with improvement of productivity of the livestock and of the owned land. A substantial increase in net income resulted. Even when adjudication does result in a reduction in the basic herd, it does not necessarily follow that a finanical loss results!

6. The alternatives (II and III) which maintained herd size without changes in productivity of the land or livestock, and resulted in small ($ - 150 and $ - 100) net financial losses had a <u>less</u> severe impact on the ranch than would a 1 cent per pound change in price of beef cattle ($ - 686). Effects of the two least desirable alternatives were not as serious as a 2 cent decline in price of beef.

7. It is unlikely that range adjudication is a primary cause of ranch business failure. Well-run ranches can be expected to survive the process, and sometimes even profit by internal adjustment. Ranches on the margin, about to fail anyway, may go out of business sooner than otherwise due to the added impact of adjudication.

8. Since BLM regulations allow up to 3 years for adjustment to adjudication, ranchers can have time to make fairly complex adjustments <u>before</u> a privilege cut becomes effective.

9. When adequate funds are available to the BLM, adjudication and improvement of the Federal range can be coordinated to assist ranchers in making desirable adjustments.

Government programs which may be used to assist ranch adjustments:

Part of the regular range management program of the Bureau of Land Management is to plan the details of a range adjudication in cooperation with the permittees affected.

The Agricultural Conservation Program of the U. S. Department of Agriculture authorized use of public funds to pay part of the costs of certain specified conservation practices on private land. Ranchers frequently can improve their lands and management with the assistance of ACP funds. Range seeding, irrigation reorganization, meadow improvement, and fencing are some of the cost-share eligible practices available to ranchers. Livestock ranches often need rather extensive improvement projects, requiring large capital outlays. Not always have enough ACP funds been available in ranching counties, and county ASC committees have had to ration available public monies among several applicants.

The U. S. Department of Agriculture's Soil Conservation Service is available to provide technical recommendations, perform free technical services, and assist in over-all ranch management planning. Many ranchers make use of these services; many others have not yet asked for such assistance.

The Farmers Home Administration, USDA, has programs of low-interest lending to farm and ranch families who are unable to obtain other credit. Such loans may be used for many purposes--farm ownership, livestock feeding, housing, specified emergencies, and conservation of soil and water. During FY 1959 only 1.2 percent of all FHA loans were for soil and water conservation. FHA services are not widely used by range livestock ranchers in the intermountain area; many ranchers needing credit are not eligible for FHA loans.

The Farm Credit Administration, USDA, supervises Production Credit Associations and Federal Land Banks, non-Government cooperatives organized under Federal sponsorship. These cooperatives are used extensively by ranchers for real estate and operating credit. Many ranchers have borrowed to the extent of their credit already, and it is questionable whether additional capital for adjustment would be available from these sources.

Additional Considerations

Cyclical price behavior is characteristic of the cattle industry. Stockmen operate in a complex economic environment of uncertainty due to fluctuations in forage supply, resulting from weather variations, and uncertainty due to price fluctuations. The impact of price changes is often quite severe. A change of 1 cent in the average price of cattle would result in a 5½ to 6 percent change in gross income for ranch models I, II, and III.

Ranch Model	I	II	III
Gross income[1]	$13,900	$12,337	$16,051
Change due to a 1¢ change in cattle price	$ 777	$ 687	$ 882

Between 1951 and 1956, high-price and low-price years respectively, average U. S. beef cattle prices actually fluctuated 14 cents per pound! The largest single change was an 8 cent decline from 1952 to 1953. Annual changes of 3½ to 5 cents are common.

1/ Gross income at long-term projected average price of cattle of $18/cwt.

Indications are that the financial impact of Bureau of Land Management administrative actions are often less severe than are normal price changes. It is unlikely that BLM activity is a primary cause of ranch business failure. However, in this connection it is obvious that the timing of BLM adjudications is important. The financial impact of adjudication, and adjustment to adjudication, may be critical in a low-price period but not too difficult to absorb in a high-price period. At present there is no formal policy in the BLM that takes beef price fluctuations into consideration when planning range adjudication.

Validity of Range Surveys and Studies

Historical Considerations

The techniques used in range management evaluation studies have as their basis an extensive amount of research and observational work completed over many years. These scientific undertakings have developed correlations between environmental influences and plant populations on various types of rangeland.

Destructive influences that are mainly instrumental in initiating secondary successions in range vegetation include adverse weather, over-grazing, rodent and insect use, and plowing. Drought has often modified range condition, as has plowing on limited areas; but intensity of use has been the dominant, damaging influence. Rodent and insect use has been less detrimental than grazing on most areas, since the latter constitutes a more or less sustained use, while rodent and insect populations fluctuate.

The Western range currently does not have nearly the grazing capacity that it did formerly. Only a portion of the livestock use, made during the latter part of the nineteenth century and the fore part of the present century, can now be made of the range. Its ability to support grazing animals gradually diminished through years of excessive use. However, the quality of livestock using range generally has been improved through superior breeding programs.

Since the public rangelands were placed under supervised use, to some extent, a number of years ago, the forage resource has improved but slightly, and it actually has continued to deteriorate in some places. Improvement of BLM lands since 1934 has been primarily due to more favorable weather. Actual livestock apparently has changed but little, although use by game has increased in many places.

This briefly depicts the conditions confronted. The objective of the BLM is to build the range back to something approaching its original condition. It should be well within the capabilities of modern technology to accomplish this, and perhaps to extend range productivity somewhat beyond its former state. So far there has not been a great deal of progress toward this goal.

Evidence of Range Potentialities

Some scattered, usually small areas of the range have by one means or another escaped abusive use, at least in recent years. These give a glimpse of possible forage production from native ranges. Range scientists and managers, however, are not completely dependent upon these relicts for information on range potentials. A number of experimental ranges and other controlled-use areas have been established on which the influence of different grazing intensities can be observed and studied. A number of these research areas have been subjected to heavy, moderate, and light grazing intensities. Through determinations of forage use and changes in vegetation and soil, the characteristics of different successional stages, or range conditions, associated with different use degrees have been identified. Invariably, the lower successional stages, induced by heavy grazing, are characterized by dominance of inferior forage plants. These are less palatable than those succumbing to the heavy use, or else they are invaders to the area. Invading plants under deteriorating conditions are usually annuals, either palatable or unpalatable. Even if they are relished by livestock, they supply forage for only a short period, usually in the spring or early summer. cheatgrass is an example of such ephemeral forage. Where it has invaded and become dominant, a good supply of forage is provided for only a few weeks, in normal or better years, and then livestock depending on such ranges are on deficient diets and weight gains are low or nonexistent. Also, cheatgrass and other annuals vary widely in production under different weather conditions. The result is inadequate forage, even during the growing period, whenever moisture is deficient. Perennial forage plants vary less with weather differences, and have longer growing periods thus supplying nutritious feed over more extended periods. Perennials provide not only more usable forage, but also more livestock production.

Where remnants of the more desirable perennials are still present on annual-infested range, full use of the annuals usually results in destructive use of the better forage species. The Bureau's objective under these conditions is the rehabilitation of the perennials. This amounts to increasing forage production beyond that otherwise available. It requires a rather light use of annuals.

Development of Survey and Study Techniques

The methods used by managing agencies in range evaluation are developed so as to rate the usability of range that will permit its proper use. Such use is that which will maintain a good condition range or provide improvement of a poor one. Over a long time period, it is the rate of use that permits the maximum continued livestock and game production.

As was indicated above, it was impossible to maintain the former heavy livestock use of the Western range and it necessarily declined as the resource succumbed. That intensity of use was not proper since it could not be perpetuated. Likewise, some current use rates are causing increased deterioration and some are preventing needed resource rejuvenation.

The various rating factors and requirements used in range surveys and studies are derived primarily from results of research and from critical observations of ranges under different intensities of use and in different states of deterioration. Proper-use factors for the various plant species are based, first, on the physiological needs of the species for persistance, and secondly, on the use each may be given on each particular range type and still provide for maintenance of the most desirable and most productive forage species. It is the physiological needs of forage plants that are critical in establishing allowable grazing rates.

Methods of estimating amounts of livestock and game forage either have been adopted directly from research-developed procedures or are modifications adapting some of the more intensive techniques to extensive range areas. The most frequently used measures of forage quantity are weight and ground cover. Each has particular advantages.

Forage requirements of grazing animals are derived from studies of actual grazing use on areas that are judged to be properly used and on which forage production has been determined. Such requirements are established from data obtained on experimental ranges and on grazing allotments or pastures where use and forage production values are available.

Ratings of range forage production and allowable grazing use are made in accord with the peculiarities of each range area. Factors that must be taken into account are plant composition, kind of grazing animal, and season of use. Ratings vary for different combinations of these items. However, only the most significant differences may be considered in evaluations of large areas.

Some parts of the western range have suffered extensive damage from accelerated soil erosion. In some places almost complete destruction of the soil profile has occurred. Under these conditions, the potential productivity of the site may have been permanently impaired. Also, many ranges presently are diminishing in productivity because of continuing erosion even though vegetative damage by excessive use has been stopped. These areas are in need of rehabilitation of protective cover to prevent further deterioration.

Recently the Bureau completed a thorough study of range evaluation methods being used by land management and research agencies and organizations. Results of this study are included in a report of December 1, 1960. It contains specific recommendations for modifying BLM procedures to improve their accuracy and reliability. A draft of modified range survey procedures incorporating the findings of the earlier study has been prepared and is undergoing review.

Tests of Range Survey and Studies Validity

While it would be desirable to test range study results in an objective manner, devoid of any bias from judgment determinations, such invariable tests do not exist. Statistical measures of data variability are useful, when applicable, in reflecting probable errors; but such tests are most properly applied only to randomly collected sample data. These tests are valuable, however, in indicating the approximate reliability of systematically obtained data of the plot or transect sampling methods used in range surveys and other studies.

For any statistical test of data reliability, a judgment first must be made of confidence limits of error that may be allowed. In research studies, these limits are set narrowly, but such accuracy is generally impractical in management studies and broader limits are normally set. These are usually within 20 percent at the 95 percent confidence level. To use much narrower limits of error would require a sampling intensity that is financially infeasible. Any such more precise evaluations would require greatly increased expenditures for adequate coverage of the Bureau's lands.

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Needed intensity of sampling (number of plots) for plot methods of range survey has been approximated from statistically tested study results. The number of plots established per sampling unit (range type) is that required to give the level of accuracy desired for a particular range. In practice sampling intensity standards are established to provide adequate data for almost all range types, since it is impossible to make specific computations for every sampling unit of a range survey.

Most studies of survey methods and techniques have been devoted to determinations of needed intensity of sampling 1/ and to the extent of variations between estimates of different members of the survey party. 2/

1/ Costello, D. F. and G. E. Klipple. 1939. Sampling intensity in surveys made by the square-foot density method. Jour. Am. Soc. Agron. 31: 800-810.

2/ Reid, E.H., G. D. Pickford and N. T. Nelson. 1942. An appraisal of range survey methods from the standpoint of effective range management. Pac. Northwest For. and Range Exp. Sta. Range Research Report No. 2.

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The best of these studies have provided good guides for setting survey standards. Where training of estimators has been adequate, their estimates have proved to be uniformly dependable when using the more improved survey techniques.

Most range evaluation methods used by the Bureau, as well as other managing agencies involve reconnaissance procedures and provide data that are not amendable to statistical analysis. These data are derived form ocular observations and judgment determinations. They are as accurate as the knowledge , ability, and training of the examiner permits. For this reason the emphasis is on using well-qualified and highly-trained personnel. Data obtained from judgment methods are not necessarily invalid just because they lack statistical tests. In fact, observational procedures are superior to plot methods because they include a much greater proportion of the rating unit (range type). A large part of each type is studied and given consideration in obtaining average estimates by these procedures.

The ultimate test of established grazing capacities or stocking rates is a determination of vegetational changes induced by the prescribed use. If such changes are not toward a betterment of poor-condition ranges or the maintenance of good conditions, an adjustment is indicated.

It must be stressed that range survey estimates of grazing capacity do not have permanent validity. They are valid, if properly made, for current conditions. However, changes in intensity of use, growing conditions, or refinement of evaluation techniques may create situations under which reevaluations become appropriate. The Bureau's program provides for periodic rechecking of established grazing capacities through range condition and trend studies and data on actual use of each area. Needed changes in grazing use are to be made to continue range rejuvenation or maintain a good condition, and also to provide a maximum of livestock production in the future. It is inconceivable that there will ever be a time when no changes are occurring, on at least some parts of the range, that will warrant reevaluation and adjustments in grazing use.

As in every other scientific field, available measurement techniques can be expected to improve with continued research and study. While range methodology is progressing more slowly than is that of comparable fields, significant advancement is anticipated. This will be proportionate to financial and personnel resources devoted thereto, and the Bureau will continue to screen these developments and use them appropriately in modifying its procedures.

Examples of Natural Range Rehabilitation

The fact that most range lands are not in an optimum condition is illustrated by data from a number of controlled grazing trials. Trials demonstrating range potentials are scattered through most parts of the West, but are more available for observation in some places than others. A few such areas are mentioned hereafter.

At the Desert Experimental Range in Southwestern Utah, light and moderate grazing intensities allowed the more valuable shrubs and perennial grasses to assume dominance in the desert types used as winter sheep range. Heavy use suppressed the better plants and allowed less palatable shrubs and annuals (mostly Russian thistle) to prevail. These studies have indicated the extent of permissable use for the major species to assure their perpetuation. Values such as these provide guides to proper range survey factors for similar ranges. It was also found that incomes from herds wintered at moderate intensities of grazing averaged more than twice as much per ewe than those realized from heavy grazing.

At the Saylor Creek Experimental Range established in 1959 on cheatgrass range in Southwestern Idaho, some startling results already have been obtained. Fenced pastures used by cattle at light and moderate intensities now support good stands of native perennial grass where the vegetation was primarily cheatgrass when fenced. Remnants of the original perennial grasses are present on most cheatgrass ranges, and may be expected to provide rapid rehabilitation of these areas if heavy grazing is avoided.

Fenced areas at the Squaw Butte Experiment Station, formerly supporting a depleted sagebrush-grass cover, have made significant recovery of the good perennial forage grasses when heavy use was replaced by a more moderate rate. Results similar to this have also been obtained at the Upper Snake River Experimental Range at Dubois, Idaho, at the Starkey Experimental Range near LeGrande, Oregon, and at other study areas in the western states.

Whenever livestock production and financial returns are studied in connection with grazing intensities, the advantage over a period of years is almost always with the moderate rates; although light use sometimes is equally as profitable. Moderate and light intensities result in high condition ranges which can be expected to yield better livestock production. Heavy use rates often have presented the greatest production and returns when the initial range conditon was near optimum. The long-term result was deteriorated forage cover and reduced returns.

Many depleted grazing allotments on BLM and other lands, for which grazing use rates have been adjusted to findings of range surveys and other studies, have been observed for subsequent changes. In most cases, these have shown some degree of natural recovery. Only rarely has the rate of improvement been so great as to support the thesis that unnecessarily heavy reductions were made as a result of survey evaluations. On the contrary, in a far greater number of cases, recovery rates have beennonexistent or so slow as to indicate inadequate initial adjustments in use. It is the function of follow-up studies (condition and trend) to detect the need for further use adjustments. However, the Bureau's objective is to make the most accurate initial range survey and study evaluations possible. Techniques and methods are devised and modified in accord with the best technical advancements to assure reaching this goal.

Artificial Improvement of Ranges

In most grazing districts, a major portion of the public range is dependent on natural vegetative recovery for improvement of depleted areas. This must be brought about generally through rejuvenation of perennial forage plants by controlling use intensity. Partial recovery may be obtained by installing adequate livestock distributing facilities such as fences, water developments, and trails, but use reductions usually must be employed to some degree as well.

Some poor-condition ranges can be successfully treated with such practices as seeding with adapted species, brush and weed control by mechanical or chemical means, or treatment for greater water penetration by contouring, subsoiling, or waterspreading. Where such treatments are completed, greatly improved forage production may be expected, provided the treated areas are given sufficient protection to permit establishment and development of the new forage cover. The necessity of total protection from grazing for a few years sometimes makes the initial economic impact on livestock operators greater for these range treatments than would be realized initially from reductions in use to permit natural recovery. However, full resource recovery will usually be realized sooner with the artificial treatments.

Areas of range that are most responsive to presently available treatment techniques are the most productive portions, and maximum increased forage may be expected there. However, new means of treating rangelands of low quality for increased production and more rapid recovery undoubtedly will be developed as soon as the needed research efforts are possible. In the past funds have not been available for this needed research, nor for treatment of areas for which successful methods are presently available.

Acceptance of Range Survey and Study Results

Before the validity of range surveys and studies can be accepted, a definite acquaintance with the principles involved and the properness of results must be obtained. This is most difficult where the results require changes in range usage that are assumed to be in conflict with the best interests of the livestock operators.

Technical range management is similar to any other advancing field of scientific knowledge. Among the newly discovered facts there are bound to be some that conflict with customary practices, and tradition is a strong opponent to change of any kind. However, the means are available by which the support of most range users can be obtained; and, as a matter of fact, the active support of many is already a reality. In addition to explanations of evaluation techniques, it is necessary to give users actual experience with the benefits to be derived from conforming with the levels of range usage indicated by surveys and subsequent reevaluation studies. This necessary experience may be imparted to many by having them observe demonstrations at experimental ranges or on well-developed and managed allotments or pastures. For some, it may be necessary to present adequate inducement to have them personally provide proper use practices on their own allotments before full acceptance may be expected. In any event, it seems certain that opposition to needed range adjustments will ultimately be overcome. The Bureau's aim is to do everything feasible to bring about this harmony.

Condition and Trend Studies

Condition and trend studies are the means of keeping track of ranges under management. Data collected every five years give the range manager factual current information about what shape his ranges are in and whether they are improving or declining in condition. These facts are essential to current management decisions.

The BLM's condition and trend studies have been undergoing development and evaluation. Recent statistical analysis of condition and trend data collected in Western Colorado indicate that the study methods used are sound and will measure changes in forage stand and soil mantle accurately enough to suit the management needs of the BLM. It was also found that field personnel can be trained in the methods so that observations by different workers are consistent and reliably comparable.

The Cheatgrass Problem

The advantages and disadvantages of cheatgrass have been belabored endlessly in technical publications, rancher-technical discussions and grazing hearings.

Much of our western range is predominantly cheatgrass. This situation has come about through heavy livestock use, repeated burning, or a combination of both resulting in deterioration or destruction of undesirable perennial grasses. These grasses have been replaced by undesirable perennial vegetation such as sagebrush and rabbit brush and by annuals such as cheatgrass and Medusahead rye.

Parallel with the change in vegetation has been soil deterioration with, in many cases, significant losses of topsoil and fertility. Annual vegetation, because of its shallow root system and short life cycle usually cannot provide the protection and moisture-holding capacity the soil needs. Perennial grasses, on the other hand, have deep, complex systems of fibrous roots which hold the soil in place and allow infiltration and retention of moisture.

Perennial grasses provide a stable supply of forage. Fluctuation in total annual growth of perennial species is much less than with annuals. The forage production of cheatgrass, as with other annuals, fluctuates greatly with variations in moisture and temperature within the growing season and from one season to the next.

Compared with perennial grasses, forage production by cheatgrass is often very short during the early-spring grazing period. Cheatgrass normally makes heavy growth during the mid-spring period and matures early during late spring. Often much of the cheatgrass growth is made after most livestock have moved to higher ranges. Remnant perennial plants frequently are over-utilized severely during early spring, late spring and summer on cheatgrass ranges.

Cheatgrass is highly palatable and nutritions during the short period it is green. The Bureau of Land Management fully recognizes this fact. However, we consider a cheatgrass range to be an extremely unstable range and in most cases are trying to manage the range to permit a conversion to perennial plants.

Conversion of a range from cheatgrass to perennial grasses by improved management is a slow process. If reseeding is possible the conversion often can be made within a few years. Cheatgrass must be considered for what it is worth, and management must be varied accordingly to permit as much use of the cheatgrass as possible while still preventing damage to perennial grasses.

The proper use factor assigned to cheatgrass in grazing capacity determinations of a range survey varies with the circumstances and the management objectives involved. Cheatgrass is given a higher rating on a range that will be used only during the spring season than on a spring-summer-fall range since the period of primary growth for cheatgrass is confined to a relatively short period in the spring. Also, cheatgrass may be given a higher rating on a range where the management objectives do not include restoration of the perennial cover. Full and proper use of a cheatgrass range can be attainad only through a management system that has the flexibility to allow for the extreme variation in annual production in cheatgrass. Conditions must be analyzed each year and adjustments made according to growth and utilization conditions for that year. The initial stocking rate or "commitment level" must be conservative to guard against the years of average or below average production. Annual stocking rates may be higher or lower than the commitment level.

Conclusion

By law the Bureau of Land Management has the primary goal of range resource conservation. This is contributory to the long-term general welfare of society through perpetuation of at least minimum levels of production from soil and vegetation on the national land reserve. It also contributes to the long-term welfare of the range livestock industry; this closely related goal is also assigned the BLM by law in terms of stabilizing the dependent livestock industry. The Bureau has not been assigned concern for the short-term welfare of ranchers, but in actual practice has tried to operate its programs in such a way as to promote short-term ranch welfare as often as possible. Where immediate permittee welfare and long-term conservation and welfare conflict, the Bureau's statutory responsibility lies with the latter.

Range conservation is pursued by a program of several activities designed to achieve proper present use of the range and improvement of the resource wherever possible. Many parts of the Federal range are in seriously depleted condition due to misuse during the years prior to passage of the Taylor Grazing Act, and the BLM is only now really beginning its management job. This long delay has been primarily due to lack of personnel and funds. As one step in the overall range management program the BLM often finds it necessary to impose reductions in permitted use of the range. Thus an area of conflict exists between long-run conservation and welfare goals and short-run rancher welfare.

Specifically it is claimed that permit reductions are seriously detrimental to immediate rancher welfare and are forcing ranchers out of business. Exploratory examination of the effects of adjudication on ranches indicates that reduction of permitted use of the Federal range does impose a financial burden on ranchers by necessitating acquisition of alternative, more expensive, sources of feed and/or reorganizing the ranch and its operations. However, data from adjudicated units in Oregon and Idaho and the results of theoretical analysis of small-sized ranches indicate that the financial burden of adjudication is not as heavy as is often claimed. Many of the anti-adjudication arguments are more emotional than rational. Nevertheless, the fundamental basis for the arguments does exist, and is the conflict between short-run rancher welfare and long-run conservation and welfare. The problem is to find some means of minimizing this conflict.

Alternative I-B, providing for timing of BLM adjudication efforts to livestock price cycles. This would provide that grazing reductions become effective only during years in which cattle prices are above average. This would avoid the adding of financial burdens onto ranchers already in difficulty during low-price periods. Theoretically, implementation of needed range adjustments would be possible during about half the years of any price cycle. This alternative is, at best, a weak one for the following reasons: (a) It would necessitate administrative determination of an official "average price" which could easily become an unwanted burden and political liability similar to the U. S. Department of Agriculture's "parity price." (b) It would tend to "bunch" the BLM's programs into blocks of several years in which work "could" and "could not" be done. These periods could not be predicted accurately. The result would be unmanageable programs in the field and nearly impossibly complicated programming and budgeting in the Office of the Director.

Alternative I-C, more adequate and timely financing of the BLM's range management and improvement programs. Experienced range managers state that when they are able to definitely commit the BLM to an aggressive range management and improvement plan, they have little difficulty in obtaining rancher cooperation and ranchers are aided in making orderly ranch adjustments. The BLM has not yet had adequate funds available, when needed, to permit timely implementation of well-rounded plans for range management in the grazing districts. Frequently the program has had to be activated one piece at a time with no certainty as to when other essential steps would be funded and implemented. This uncertainty has been demoralizing both to ranchers and to BLM personnel. It may be possible to obtain considerable rancher support for this alternative.

Alternative I-D, better integration of existing range management and improvement programs. Historical circumstances have resulted in the growth of separate activities that are means to intermediate goals, that are in turn means to range conservation. Range administration, range improvement, soil and moisture, weed control, and fire rehabilitation programs have different legislative origins. They also have differing specific objectives assigned by Congress. Because they are funded and accounted for separately there sometimes has been a tendency for them to remain somewhat separate in field application also. The

experience among field locations has varied, and there are differences of opinion on this point among members of the staff of the Division of Range Management. Some progress toward better coordination has been made. However, there is evidence that there is still less than optimum integration of activities. Better coordination of existing programs should improve the effectiveness of existing appropriations and help reduce BLM-rancher conflicts. One aspect of the problem which should be analyzed is the methods of allocation of available funds among BLM State Offices and among grazing districts. This course of action is closely related to that of obtaining more, and more timely funds. It should be given more intensive study. It is recommended that alternatives I-A and I-B be rejected, that I-C be adopted, and that I-D be given further study preparatory to adoption.

Alternative II-A, government purchase of range privileges from ranchers. It has been proposed that government indemnification of ranchers whose privileges are reduced would reduce resistance to needed range adjustments. Such a plan would require new legislation and appropriation. It would have the advantage of providing ranchers in adjudicated units with capital to facilitate ranch adjustments. Determination of rates of payment for reduced AUM's would be more complex and difficult than determinations of payments made for land acquired for highway rights-of-way. It would officially convert long-standing "privileges" to "rights." In the long run such a course of action might actually impede rather than facilitate adjustments. Ranchers would likely hold, even more tenaciously, licensed privileges they do not actually use. Also we could expect any newly created value of the AUM privilege to be capitalized into private ranch properties, worsening a situation already contributing to resistance to range adjustments.

Alternative II-B, payment of a direct subsidy to ranchers affected by adjudications. Justified as a means of facilitating range conservation, such a subsidy could assist ranchers make necessary adjustments by providing them with badly needed capital. It would do so without many of the complications associated with Federal purchase and retirement of privileges. This course of action would require new legislation and appropriation. It would be unpopular with the livestock industry whose members vigorously oppose overt subsidies. (The industry would be less likely to oppose alternative II-A which is basically the same as II-B.) It is recommended that alternatives experience among field locations has varied, and there are differences of opinion on this point among members of the staff of the Division of Range Management. Some progress toward better coordination has been made. However, there is evidence that there is still less than optimum integration of activities. Better coordination of existing programs should improve the effectiveness of existing appropriations and may reduce BLM-rancher conflicts. One aspect of the problem which should be analyzed is the methods of allocation of available funds among BLM state offices and among grazing districts. This course of action is closely related to that of obtaining more and more timely funds. It should be given more intensive study. It is recommended that alternatives I-A and I-B be rejected, that I-C be adopted, and that I-D be given further study preparatory to adoption.

Alternative II-A: government purchase of range privileges (and ranches). It has been proposed that government indemnification of ranchers whose privileges are reduced would reduce resistance to needed range adjustments. Such a plan would require new legislation and appropriation. It would have the advantage of providing ranchers in adjudicated units with capital to facilitate ranch adjustments. Determination of rates of payment for range privileges would be more complex and difficult than determination of payments made for land acquired for highway rights-of-way. It would officially convert long-standing "privileges" to "rights." In the long run such a course of action might actually impede rather than facilitate adjustments. Ranchers would likely hold, even more tenaciously, licensed privileges they do not actually use. Also we could expect any newly created value of the AUM privilege to be capitalized into private ranch properties--worsening a situation already contributing to resistance to range adjustments.

Alternative II-B: payment of a direct subsidy to ranchers affected by adjudications. Justified as a means of facilitating range conservation, such a subsidy could induce ranchers to make necessary adjustments by providing them with badly needed capital. It would do so without many of the complications associated with federal purchase and retirement of privileges. This course of action would require new legislation and appropriation. It would be unpopular with the livestock industry, whose members vigorously oppose overt subsidies. (The industry would be less likely to oppose alternative II-A which is basically the same as II-B.) It is recommended that alternatives

II-A and II-B be rejected. Other courses of action can meet the Bureau's needs with fewer political and administrative complications.

Alternative III-A, making special provision for adjudication affected ranchers under the Agricultural Conservation Program. ACP has been established to provide for Federal cost-sharing in private conservation practices beneficial to society. Ranchers often qualify for substantial cost-share funds but sometimes find that the county ASC committee does not have enough money to go around. Improvement of privately owned ranges and haylands is often an essential part of successful adjustments to range conserving privilege reductions.

The ACP program might be modified to provide: (a) substantial ACP fund allocations to counties in which Federal range is being adjudicated, and (b) a system giving ranchers in adjudicated units a preference in allocation of funds within a county. Another possible modification would be to designate additional ranch practices as cost-share eligible on the basis that they facilitate conservation of public lands. Such modifications would require BLM-ACP coordination. They might require additional appropriations for ACP. They would be fully effective only if ranchers were able to acquire capital for their own share of improvement practice costs.

Alternative III-B, establishment of range conservation and ranch adjustment loans within the Farmers Home Administration. The U. S. Department of Agriculture's FHA has traditionally been assigned farm income problems due to capital restrictions. The impact of range adjudication and privilege reductions is financial and capital is the major resource restriction on ranch adjustment. The FHA program and appropriations might be enlarged to provide long-term, low interest, loans for adjustments on ranches affected by range adjudication. Such a modification would require additional appropriations to FHA. At present FHA interest rates cover Federal costs of money. Costs of administration are paid by the public. Administration costs chargeable to range conservation and ranch adjustment loans would be a subsidy for the purpose of furthering conservation. It would be indirect and less unpalatable to the livestock industry than a direct subsidy.

It is recommended that both III-A and III-B be given consideration and study as practical alternatives complementary to I-C and I-D.

Alternative IV-A, institution of a system of government-guaranteed privately financed conservation and adjustment loans. This too would make needed capital available to ranchers. Such a program would have the advantage of avoiding some criticism by utilizing private businesses instead of increasing government programs. The workability of such a plan is unknown and has not been investigated. Private lenders have shown little interest in this area. They are reluctant to lend to ranchers already carrying heavy debts and needing more capital. Many ranchers affected by adjudication and needing more capital are already carrying all the debt private lenders consider safe. In addition, ranchers would have to pay market rates of interest for money borrowed from private sources. Many might not consider returns from conservation practices adequate to justify their paying market rates of interest.

Alternative IV-A may be worthy of further study in comparison with alternative III-B.

In summary it is recommended that the BLM move to minimize conflicts between long-term range conservation and welfare goals and short-term rancher welfare goals by:

(a) Seeking more adequate and timely financing of range management programs.

(b) Better integrating its various range management activities.

(c) Studying the possibility of recommending a broadening of existing FHA and ACP programs in the Department of Agriculture to provide capital needed by ranchers adjusting to range adjudication.

(d) Examining establishment of a new Federally guaranteed, privately financed, loan system in place of expansion of the FHA program.

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