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RANCH AND RANGE BALANCE

The Public Lands and Ranch  
Stability In Nevada

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By

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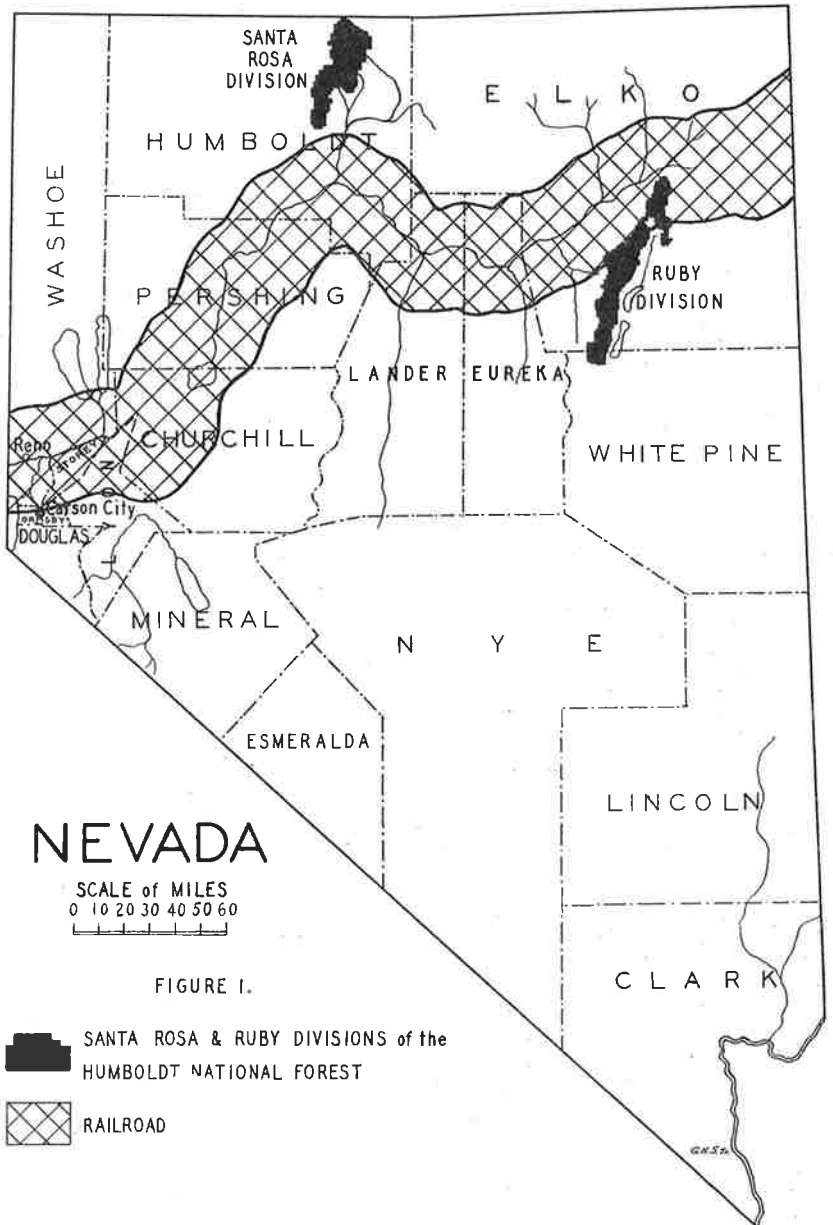
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SCALE of MILES  
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FIGURE I.

 SANTA ROSA & RUBY DIVISIONS of the HUMBOLDT NATIONAL FOREST

 RAILROAD

# RANCH AND RANGE BALANCE

## The Public Lands and Ranch Stability In Nevada

In order to study the problem of balance between ranch and range one should first have a clear understanding of the following self-evident principles:

1. A balanced cattle ranch and range operating unit involves the use by livestock of the forage produced on both deeded and public lands in a manner conducive to forage conservation and a profitable enterprise. The degree of balance depends upon how the working parts of the complete unit, namely, acreage and production of owned lands, size of grazing privilege and available forage on public lands, length of grazing season, and numbers of livestock, are fitted together and used. When these working parts are fitted together and used in a practical way conducive to a long-time profitable enterprise of fair investment valuation, the ranching unit may be considered balanced.

2. The difference between receipts and operating costs (excluding interest and principal payments) represents earning power balance, upon which depends the ability to pay interest and retire principal.

3. The loan or investment value of ranch land and cattle is dependent upon the earning power of the cattle and ranch and range set-up as a whole. If the land and cattle are mortgaged separately and the conditions of the cattle mortgage are first satisfied from the earning power balance, then the loan or investment value of the land shrinks to the value which the remaining earning power balance is capable of supporting.

4. A sound cattle ranch loan is one on property embracing a complete unit with an earning power balance at least capable of satisfying the long-time amortized interest and principal payments due on the land as well as on the livestock chattels.

5. Cattle ranch set-ups balanced with range privileges are prerequisite to adequate earning power.

The present balance between ranch set-ups and range privileges determines the degree of stability that exists in the range cattle ranching industry of Nevada and most of the intermountain States. The future of the industry and the destiny of ranch homes and improved lands will hinge upon the rules and policies to be instituted by the Forest Service and through the Taylor Grazing Act. If the goal is ranch stability as well as range preservation, then it is imperative that the grazing services, the credit agencies, and the stockmen themselves, recognize that fact and all work to that end.

In order to show the result of fairly good ranch and range balance versus unbalance, the ranching areas in the Ruby and Santa Rosa divisions of the Humboldt National Forest are compared. These districts are chosen because they illustrate the importance of ranch and

range balance and because Forest Service records of land ownership and production were readily available for the two areas.

These comparisons involve no criticism of the Forest Service because it is fully realized that this unbalance in the Ruby area cannot be attributed solely to the Forest Service, since many other factors such as the use of the public domain, the railroad checkerboard strip, drought, depression, and split loans on land and livestock contributed to the situation. Some of these factors, such as drought and depression probably bore equal influence in the two areas. However, the effects of the checkerboard strip of railroad land and the restricted use of the public domain are more pronounced in the vicinity of the Ruby division than they are in the Santa Rosa.

The public range that is used in connection with a ranch may be called companionate range.



Figure 2. Typical Summer Range on the Higher Elevations of the Ruby Division of the Humboldt National Forest.

The companionate ranges of the Ruby division ranches were decreased when the railroad saw fit to exercise its right of ownership and gradually leased its grazing lands which also control the alternate sections of public domain. Approximately one-third of the Ruby forest and over half of the area between the railroad and forest boundary fall within the railroad land strip. These companionate ranges were further gradually restricted with the inception of forest rules and State range laws which did not attach grazing privileges to deeded land production. As a consequence of these facts, together with public land settlement, many of these ranchers were compelled to expand their land holdings in an attempt to maintain their herds and flocks, and the bulk of the ranch land at the base of

the Ruby Mountains was being operated with only a very limited supplemental use of companionate ranges.

Either this situation was not definitely recognized or the importance of the public range to a ranching enterprise was not generally appreciated, since lands in the Ruby district have been given tax and loan valuations comparable to the earning power value of ranch lands that are supplemented with adequate public grazing privileges.

None of the Santa Rosa division falls within the railroad checker-board strip. However, the use of the range south of the Santa Rosa is influenced by railroad lands, but this influence is not so pronounced as is the case in the vicinity of the Ruby division.

In the early stages of development, when range availability and use were fairly comparable, both the Santa Rosa and Ruby areas were considered prosperous, so there is probably no material difference in the managerial factor.

When the Forest Service was established, it accepted the livestock situation as it existed at the time, and recognized permit applications based on existing use, which was thereafter called customary and priority use. Application blanks were sent out and the prospective permittees were asked how many head of stock they owned and the number they desired to graze under a forest permit. In many instances the answers were incorrect because stockmen in those days did not care to reveal their numbers. Usually the numbers first applied for were low; as stockmen did not want to pay any more fees than they had to, and they believed that many of the nonpermitted stock would graze on to the forest anyway, since boundary fences were lacking and regulations were not developed or commonly known. Later on, many boundary lines were closed by fences and rules were tightened up, allowing only permitted stock to graze.

With these early grazing applications as to number of livestock as a base, what is known as a protective limit was established. It was usually arrived at by dividing the number of cattle permitted by the number of permits. The protective limit is the set number to which Class A permittees can build up, and to which Classes B and C permittees can be scaled down.

A few of the foundation rules for the two districts follow:

#### SANTA ROSA

Protective limit.....	150 head of cattle, 1,250 head of sheep.
Cattle requirement.....	1 ton of hay for each head owned, or the production capacity of hay land forage equivalent thereto.
Sheep requirement.....	Right of privilege by prior use, existing at the time the Service was set up.

These requirements are subject to the protective limit for the division.

#### RUBY

Protective limit.....	100 head of cattle, 1,250 head of sheep.
Cattle requirement.....	1 ton of hay for each head owned, or the production capacity of hay land forage equivalent thereto.

Sheep requirement.....The production of 25 tons of hay for every 1,000 head of sheep owned, plus the ownership of enough land for spring and fall range, or ownership of land controlling sufficient spring and fall range.

These requirements are subject to the protective limit for the division.

To these rules many other regulations were added to control, protect, and rehabilitate the forest ranges. Some of the regulations were made on the advice and by the request of stockmen's advisory boards. As new rules were developed, permits were made transferable with sales of cattle or sheep from one operator to another, subject to some reduction. With this set-up, herds of cattle and flocks of sheep carrying forest permits changed hands at \$3 to \$5 per head more than the market price of nonpermitted animals.

The table on page 9, based upon permits issued for the year 1934, gives a general comparison of the Santa Rosa and the Ruby divisions of the Humboldt National Forest. In 1934 there was an unprecedented drought in the western range country and both of these areas were stocked to capacity, with the Santa Rosa probably slightly overstocked, according to Forest Service officials.

The difference in type of the two ranges is shown by the fact that approximately 10,000 acres, or 3%, of the Santa Rosa division are barren or inaccessible to livestock, while approximately 82,808 acres, or 20%, of the Ruby fall in that classification. The productive and accessible grazing area of the Santa Rosa is 288,458 acres, approximately one-eighth less than that of the Ruby division, which comprises 331,232 acres.

Including numbers permitted on account of alienated lands, the Santa Rosa provided 84,312 animal unit feed months, of which 71,328, or 85%, were used by cattle; whereas, the Ruby division provided 98,378 animal unit feed months of which 49,905, or 51%, were used by cattle.

Table I shows that each division required approximately 3.4 acres to provide an animal unit one month's grazing. The actual number of acres used for the season was 15.26 per animal unit on the Ruby ( $3.37 \times 4.53$ ), compared to 19.05 on the Santa Rosa ( $3.42 \times 5.57$ ). This difference was due to one month shorter grazing season on the Ruby division.

Since Table I covers both cattle and sheep, and since mixed cattle and sheep outfits offer their land and hay as qualifications for either or both sheep and cattle permits, it is impossible to make an accurate comparison of all permittees in the divisions as a whole. A good many of the mixed outfits offered their land and hay for sheep permits, grazed their cattle on the ranch or public domain, and disposed of the bulk of their hay through cattle or by sale. As a matter of fact, strictly range sheep outfits in Nevada actually use relatively little cultivated ranch land or hay. Hence, in the following table, mixed outfits running both cattle and sheep and permits covering grazing privileges on account of alienated lands within the Forest have been eliminated.

TABLE I  
A General Comparison of the Santa Rosa and Ruby Divisions of the Humboldt National Forest, 1934 Season

	SANTA ROSA DIVISION		RUBY DIVISION		Total
	Sheep	Cattle	Sheep	Cattle	
Number of Forest permittees.....	9	33	14	74	88
Head with Forest permits.....	13,848	11,106	37,918	9,681	47,600
Head permitted on alienated lands.....	2,380	782	20,836	300	24,400
Total head grazed on the Forest.....	16,228	11,888	58,754	9,981	79,733
Head owned by Forest permittees and operators grazing on alienated lands.....	21,273	17,729	73,197	27,587	100,784
Percentage of owned stock grazed on the Forest.....	76%	67%	80%	36%	73%
Units grazed on the Forest (5 sheep = 1 cow).....	3,246	11,888	11,751	9,981	25,866
Average Grazing season—months.....	4	6	4.125	5	4.53
Animal unit months on the Forest.....	12,984	71,328	48,473	49,905	98,378
Gross area of Forest division—acres.....	.....	.....	.....	.....	414,040
Approximate acres barren and inaccessible.....	.....	.....	.....	.....	82,808
Net acres used by livestock.....	.....	.....	.....	.....	331,232
Net acres per animal unit month.....	.....	.....	.....	.....	3.37



Table II indicates the qualification status of cattle and sheep permittees on these two divisions of the Humboldt National Forest.

TABLE II

A Comparison of Cattle and Sheep Permits on the Santa Rosa and Ruby Divisions of the Humboldt National Forest, 1934 Season, Excluding Permits on Account of Alienated Land and Mixed Cattle and Sheep Outfits.

	CATTLE		SHEEP	
	Santa Rosa	Ruby	Santa Rosa	Ruby
Number of permittees.....	33	69	3	8
Number of head permitted.....	10,762	8,856	4,968	20,658
Number of head owned.....	16,003	24,673	8,473	29,887
Percentage of head owned permitted.....	67%	36%	59%	69%
Average size of permit.....	326	128	1,656	2,582
Owned land: Hay land, acres.....	27,164	51,298	500	1,573
Grazing, acres.....	40,644	88,434	1,755	15,570
Total, acres.....	67,808	139,732	2,255	17,143
Acres of owned land per head permitted.....	6.30	15.77	.45	.83
Tons of hay produced.....	7,267	23,447	350	1,130
Tons of hay produced per head permitted.....	.67	2.65	.07	.05

There are over twice as many cattle permittees on the Ruby division as there are on the Santa Rosa, and the Ruby division cattle permits cover only 36% of the cattle owned by permittees as against 67% on the Santa Rosa. The average of these cattle permits on the Santa Rosa is approximately three times the size of a similar average Ruby division permit. Based on the number of head permitted, the cattle permittees on the Santa Rosa own 6.30 acres of land and produce .67 ton of hay, whereas the Ruby cattle permittees own 15.77 acres of land and produce 2.65 tons of hay.

In 1934 there were three outfits on the Santa Rosa division which grazed sheep and, practically speaking, had no cattle on the ranch, forest, or public domain, compared to eight such outfits on the Ruby. On the Santa Rosa the straight sheep outfits were permitted 59% of the sheep owned, compared to 69% on the Ruby. The average size of these sheep permits was 1,656 on the Santa Rosa and 2,582 on the Ruby. The Santa Rosa sheep outfits owned .45 acres of land and produced .07 ton of hay per head permitted, compared to .83 acre of land and .05 ton of hay for the Ruby. Straight sheep outfits in both districts held comparatively little cultivated ranch land and their hay production was relatively small. This was to be expected, since little or no cultivated land or hay is needed in strictly range sheep production.

The apparent disparity between acres of hay land and tons of hay produced is probably due to a rather loose classification of hay land and also to the fact that considerable hay land was not harvested.

Cattle on the Santa Rosa area are for the most part on public lands (Forest Reserve and public domain) from seven to ten months and on the ranch from two to five months. The ownership and leasing of open grazing lands for control and grazing in this area, such as railroad lands, is in general not an extreme burden.

Cattle of the Ruby division area are generally on open range lands from four to eight months. A long grazing season on public lands is the exception rather than the rule among cattlemen in the Ruby area.

The amount of grazing land owned and of open privately owned grazing land leased, railroad land for example, in this area is excessive and burdensome.

The suitability of these two ranges for different classes of livestock adds to the complexity of the problem. A large percentage of the Ruby Range affords high and rugged grazing best suited to sheep. The presence of larkspur on this range also detracts from its use for cattle. The Ruby Range forms an excellent watershed which provides a good supply of irrigation water for the extensive hay meadows along its base. The area of public domain adjacent to or near the Ruby Range is small and much of it is hemmed in by ranching areas where the range forage is badly depleted. In short, the Ruby forest is more suitable for sheep grazing, but the ranches near it are heavy producers of hay which is used primarily for the production of cattle. Feeder cattle and a good percentage of fat lambs are produced in this area.

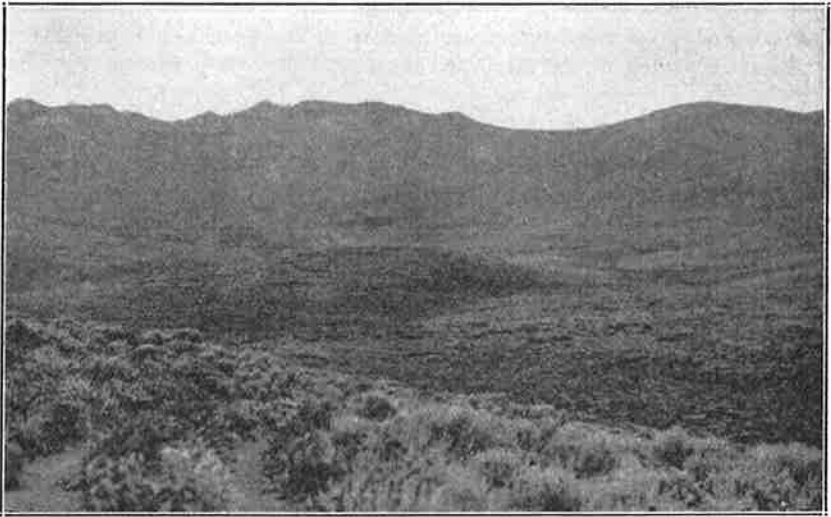


Figure 3. Type of Range on the Santa Rosa Division of the Humboldt National Forest.

The Santa Rosa Range is largely opposite in character to the Ruby, and while there are some good hay ranches at the base of this range, still the irrigation water supply and the hay production on ranches near the Santa Rosa are small in comparison with ranches adjacent to the Ruby. However, less hay for winter feeding is needed in the Santa Rosa region, since the climate is much milder than that of the Ruby area, and cattle are ranged much longer on the public lands. Feeder cattle and feeder lambs are produced in this area.

The ranches adjacent to the Ruby division average approximately 6,100 feet in elevation and have an average annual precipitation of 15 inches. Their average growing season between killing frosts is 114 days.

The ranches adjacent to the Santa Rosa division average approximately 4,600 feet in elevation, and have an average annual precipitation of 8.70 inches. Their average growing season is 125 days.

The length of the growing season and the precipitation fluctuate annually over a wide range in both of these areas, and there are many years when records fall far short of the figures given.

In some instances, the Forest Service rules evidently fitted in with the ranch set-up and built for fairly good stability. In others, apparently the rules had the opposite effect and, together with other forces such as overgrazing on the public domain, the checkerboard strip of railroad land, etc., worked to the disadvantage of ranch stability.

A comparison of the physical factors of individual permittees on the basis of permitted stock illustrates that Forest Service rules have no coherent relationship to production and amount of dependent properties. A few typical cases follow:

**TABLE III**  
A Comparison of Some Individual Permits on the Ruby and Santa Rosa Divisions of the Humboldt National Forest, 1934 Season

Ranch	Class of stock	PER ANIMAL UNIT <sup>1</sup> OF PERMITTED STOCK		
		Acres of owned land	Tons of hay produced	Head of owned stock
A.....	Cattle.....	6.62	.45	1.00
B.....	Cattle.....	12.54	.60	2.45
C.....	Cattle.....	28.30	11.35	10.40
D.....	Cattle.....	38.53	15.60	18.71
E.....	Sheep.....	4.00	1.40	1.06
F.....	Sheep.....	.92	.18	1.47
G.....	Sheep.....	1.87	.11	1.66
H.....	Sheep.....	17.65	.36	2.50

<sup>1</sup>On basis of 5 sheep = 1 cow.

On the basis of cattle permitted, ranch A has 6.62 acres of land, produced .45-ton of hay and has a Forest grazing privilege for all of its cattle, while ranch D has 38.53 acres of land, produces 15.60 tons of hay, and owns 18.71 head of cattle for every head permitted.

A comparison of the sheep permits shows a similar lack of relationship between Forest grazing privileges and production and amount of dependent properties.

The preservation of ranch stability apparently did not enter into the picture as a defined policy. The objective of the Forest Service was forest preservation and watershed and range protection, at which it is doing a commendable piece of work; and, after all, considering the circumstances and conditions the Forest Service had to meet, one could not expect it to preserve and build up ranch stability, especially since it was not expected to do so. Even if the Service had been cognizant of all the working parts and essentials that make up a stable ranching unit and had aspired to promote general ranch stability, the task would have been hopeless since it had control over only a small portion of the public range.

The difference in balance and stability between the Santa Rosa and the Ruby divisions is not all attributed to Forest regulations, because climatic conditions in the Santa Rosa area are more favorable and since there was more public domain to resort to for use when the Forest rules were established and enforced. However, the circumstances at hand in each district, together with enforcement of the

Forest Service rules, resulted in average cattle permits almost three to one larger and a grazing season one month longer on the Santa Rosa than on the Ruby division, notwithstanding the fact that the Ruby cattlemen owned more land and produced more hay than those of the Santa Rosa. Further, the limited acreage of public domain near the Ruby division caused these cattlemen to lease large areas of privately owned grazing lands, in contrast to smaller leases and two to three months longer grazing season on the public domain enjoyed by the Santa Rosa cattlemen. Obviously, the limited use of the public lands and the burdensome ownership and rental of private lands contributed heavily to the condition found among the Ruby division cattle ranches.

The degree of stability of the two areas as a whole may be indicated by comparing the land loans on ranches in each district, as given in the following table:

TABLE IV

Number of Forest Permittees and Land Loans in the Santa Rosa and Ruby Districts. All Federal Land Bank Loans and Land Loan Status of All Forest Permittees.

	SANTA ROSA				RUBY			
	Federal farm land loans	Other land liens	No land liens	Total	Federal farm land loans	Other land liens	No land liens	Total
Cattle permits .....	6	5	22	33	29	10	30	69
Sheep permits .....	0	2	1	3	0	5	3	8
Mixed permits .....	0	5	1	6	8	3	0	11
Total with permits.....	6	12	24	42	37	18	33	88
Federal farm land loans—no permits..	1	0	0	1	33	0	0	33
Totals .....	7	12	24	43	70	18	33	121
Percentage of land liens.....	19 ÷ 43 = 44 %				88 ÷ 121 = 73 %			
Percentage with no land liens.....	24 ÷ 43 = 56 %				33 ÷ 121 = 27 %			

This table shows that in the Santa Rosa district 19, or 44%, of the ranches had land liens, while in the Ruby district 88, or 73%, had their lands mortgaged.

In the Santa Rosa district 24, or 56%, of these ranchers held their lands free of debt; while on the Ruby 33, or 27%, were unencumbered. Some of these ranches that are free of land debt are supplemented with fairly good grazing on companionate ranges, others are supported by income from outside sources, and probably a very limited number are capable of operation on a self-contained basis. Ability to keep land free of debt involves management and standard of living. In the case of the instability cited, management ability is a minor factor, since most of the mortgaged operators are comparable from a managerial standpoint to those whose lands are not encumbered. There are, however, some ranchers with limited public grazing privileges whose lands are held free of debt by reason of a standard of living lower than is advisable or acceptable to the average American family.

Federal farm loans are considered the most attractive land loans. There are other land loans, joint land and livestock loans, and livestock chattels in each district. To obtain the amount of loans made by individuals and agencies other than the Federal Land Bank on all the permittees would involve abstracts of title, first and second mortgages, unrecorded liens and notes. Such a compilation would be

most difficult to obtain and in all probability would be incomplete. Hence the loan amounts compared in the tables that follow are confined to Federal Land Bank loans.

Out of \$1,677,000 of original loans made by the Elko National Farm Loan Association in Elko and its neighboring counties, \$1,085,855 was loaned on ranches in the comparatively small area surrounding the Ruby Mountains.

The following table of Federal Land Bank loans in the areas adjacent to the two National Forest divisions shows that some fundamental factor affecting the earning power of many of the Ruby outfits is unsound, notwithstanding the fact that the Santa Rosa outfits have considerable advantage, due to milder climate.

**TABLE V**  
**All Federal Farm Land Loans in the Ruby and Santa Rosa Districts,**  
**December 1, 1935**

	Santa Rosa	Ruby
Number of federal farm land loans.....	7	70
Principal balance on original land loans.....	\$51,095.98	\$970,399.05
Principal balance on commissioner loans.....	7,688.29	47,700.00
Total principal balance.....	\$58,784.27	\$1,018,099.05
Extensions and other delinquencies.....	\$6,370.34	\$105,668.50
Percentage of delinquencies.....	10.8 %	10.4 %

On the Santa Rosa division there are seven Federal farm land loans, compared to 70 in the Ruby district. The total amount of unpaid principal balance for the Santa Rosa district is \$58,784.27, compared to \$1,018,099.05 for the Ruby district. The percentage of delinquency of the original loans made on the Santa Rosa division is 10.8 and on the Ruby 10.4. This is to be expected, since the majority of the outfits on the Santa Rosa division did not take out Federal Land Bank loans and those that did were probably outfits similar to those of the Ruby division which obtained such loans.

On December 1, 1935, the federal farm land loans were delinquent in the amount of \$105,668.50 on ranches surrounding the Ruby division, compared to \$6,370.34 on ranches in the Santa Rosa area. Clearly, ways and means of increasing the net earning power of ranches heavily in default must be devised or ultimate foreclosure and land revaluation is inevitable. Each of such ranches presents an individual problem. Any attempt such ranchers make to set their operations on a stable basis involves the use of their deeded lands either on a self-contained basis or supplemented by the use of grazing privileges on public lands. Where companionate public ranges are a recognized part of the ranch operation the extent of these grazing privileges as to size and seasonal use must be pretty well defined and of a dependable nature before they can be considered a tangible earning power asset of the ranching enterprise. Where public range is an integral part of the operation, ranch land valuations are dependent upon its use. Therefore, it is of vital importance to the welfare of the ranching industry that a basic public land grazing policy be worked out and established so that the qualified users of the public range will know where they stand and what they can count on in the matter of public land grazing privileges.

From inquiry of reliable parties familiar with the situation, loans other than federal farm loans to Santa Rosa permittees were for relatively small amounts in all but one case. In contrast, similar land and chattel loans to many of the Ruby permittees were rated as relatively large and burdensome. These observations are further evidence that the range livestock operations in the Santa Rosa area have a greater degree of stability than those of the Ruby area.

The following table gives the status of federal farm loans to cattle permittees on the Ruby and Santa Rosa divisions of the Humboldt National Forest:

**TABLE VI**  
**Federal Farm Land Loans by Cattle Permittees (Mixed Outfits Omitted).**  
**Loan Status, December 1, 1935**

	Santa Rosa	Ruby
Number of cattle permittees, 1934.....	33	69
Cattle permittees having federal farm land loans.....	6	29
Balance of original federal farm loan principal.....	\$41,054.63	\$396,515.18
Balance of original commissioner loan principal.....	7,688.29	35,800.00
Total original principal balance.....	\$48,742.92	\$432,315.18
Total extensions and other delinquencies.....	\$4,898.34	\$33,684.57
Percentage of delinquencies.....	10.05 %	7.79 %
Total original principal balance.....	\$48,742.92	\$432,315.18
Divided by total head owned by permittees (Table II).....	16,003	24,673
Equals farm land loans per head owned.....	\$3.05	\$17.52

The six cattle permittees on the Santa Rosa have a total of \$48,742.92 of original farm loans outstanding, compared to 29 Ruby division permittees with \$432,315.18 of original loans outstanding.

The significant fact in this table is that federal farm land loans per head of all cattle owned by the cattle permittees on the Santa Rosa averaged \$3.05 in comparison to \$17.52 on the Ruby. Obviously, had all land loans and chattel mortgages been included this difference would have been even more striking.

A comparison of the preceding tables indicates the degree of unbalance existing among cattle outfits adjacent to the Ruby division compared to the fairly good balance among those of the Santa Rosa.

The Nevada Experiment Station started a study of the range cattle business in 1928 and a study of the range sheep business in 1933. The cattle study embraces a period of good and bad times and the information is sufficiently representative to substantiate the data and conclusions that follow.

The sheep study embraces only the abnormal period since 1933; hence the information covers too short a time and is not sufficiently representative to warrant conclusions of a definite nature. However, from observations based on the past history of the industry and from the present set-up of range sheep outfits in Nevada, one may draw the following general conclusions:

1. A straight range sheep operation requires little or no cultivated ranch land.

2. A good many straight range sheep outfits own or lease substantial areas of grazing lands, while others operate with relatively small areas of owned or leased lands.

3. The range sheep business makes a greater use of public lands than does the range cattle business.

4. When climatic conditions are right the range sheep industry generally is prosperous, even though prices only approximate the long-time average for wool and lambs.

5. When climatic conditions are adverse, losses may be excessive, and the business suffers even though prices may be substantially above the long-time average.

6. The stability of the range sheep business in the past has depended more on the weather than on the price received for the products.

The Experiment Station's studies of the range cattle industry indicate that much of the disparity between the Ruby and the Santa Rosa divisions of the Humboldt National Forest is due to the alarming degree of ranch and range unbalance existing on the Ruby division.

These cattle studies indicate that the important range fundamentals bearing on ranch earning power and stability are:

1. The abundance and use of forage on the public range.

2. The volume of production, at least up to the size the operator can efficiently manage.

3. The length of the grazing season and the number of cattle permitted on the public range.

4. The degree of balance between ranch and range.

Table VII indicates the influence of range forage abundance on earning power:

TABLE VII

Earning Power of Ranches with Good and Poor Public Range  
(Excluding All Interest)

1910-1932 average price received for beef cattle 6.23 cents per pound

1910-1932 average costs (from index numbers) 13% lower than 1928-1930

GROUP A—BENEFICIAL USE OF FAIRLY GOOD PUBLIC RANGE		1928-1930		1910-1932
		Average per cow		Average per cow
Receipts—		unit		unit
From cattle—239.91 pounds @ \$0.08.....		\$19.28		@ \$0.0623 \$14.95
Costs—				
Labor, paid and unpaid.....		\$6.45		
Feeds and grazing.....		1.34		
Parts and supplies.....		2.39		
Taxes, insurance, and management.....		2.05		
Depreciation .....		1.53		
Total cost .....		\$13.76		
Sales, increases, and credits other than cattle.....		1.75		
Net cost .....		12.01	reduced 13%	10.45
Earning power balance.....		\$7.27		\$4.50
GROUP B—LIMITED USE OF LOW-GRADE PUBLIC RANGE				
Receipts—				
From cattle—225.50 pounds @ \$0.08.....		\$18.30		@ \$0.0623 \$14.05
Costs—				
Labor, paid and unpaid.....		\$9.35		
Feeds and grazing.....		1.64		
Parts and supplies.....		3.28		
Taxes, insurance, and management.....		1.97		
Depreciation .....		2.44		
Total cost .....		\$18.68		
Sales, increases, and credits other than cattle.....		3.57		
Net cost .....		15.11	reduced 13%	13.15
Earning power balance.....		\$3.19		\$0.90

This long-time earning power balance for Group A of \$4.50, divided by 6 percent interest, gives the earning power investment of \$75 per cow unit. In other words, for the 1910-1932 period, each cow unit on the good range ranches could support \$75 in land, permanent improvements and allied equipment, including the cow herself.

Group B, with a limited amount of low-grade range, shows an earning power balance of \$0.90, divided by 6 percent, or \$15 earning power investment per cow unit, not enough to support the cattle alone.

Note that the difference in net earning power between good range and limited poor range is \$4.50 minus \$0.90, or \$3.60 per cow unit on a long-time basis.

Clearly Group B ranch lands have no earning power value when operated in a range cattle set-up. Occasionally outfits of this kind are found struggling along and meeting their obligations by using a substantial part of the unpaid family labor allowance (included in costs), thereby lowering their standard of living. To remain in the range cattle business and maintain reasonable land values and living standards, such ranchers would have to establish a better ranch and range balance. In the past, livestock enterprises on a self-contained basis in the range areas of Nevada have ended in disappointment. However, it may be possible to find a new use for some of these ranch lands that will be conducive to stability on a self-contained basis.

If a reasonable ranch and range balance cannot be established and if no alternative on a self-contained basis is profitable, then tax and loan values on ranches with inadequate range cannot escape a downward adjustment.

Ranch stability cannot be attributed to such physical factors as inadequate ranch and range balance in all cases, since the human element and managerial factor also exert a tremendous influence on success or failure. For instance, one bad move, such as a heavy purchase of land or livestock at peak prices, might be sufficient to cause an otherwise stable set-up to become shaky and collapse.

The influence of size, or volume production, on earning power is indicated in the table on page 18.

This table shows that the net earning power balance increases with volume production and more abundant public range forage from \$0.78 per cow unit for Group I to \$4.84 per cow unit for Group V.

*Sample Illustrations*—6% is assumed as a reasonable rate to pay interest and retire principal. \$30 is estimated as the value per head of mixed cattle.

#### GROUP I

401.96 cow units ; 486 head of cattle

Earning power balance \$0.78 ÷ .06 = \$13.00 investment value per cow unit

401.96 cow units × \$13 = \$5,225.48 complete investment value

486 head mixed cattle × \$30 = 14,580.00 cattle investment value

Difference..... \$9,354.52

Group I earning power lacks \$9,354.52 of being able to carry the cattle investment alone, not to mention land and allied equipment. In this group are included a number of outfits with a limited use of poor range which, together with the influence of small size, reacts adversely on earning power. This comparatively low earning power does not



TABLE VIII

## Receipts and Costs per Cow Unit on Northeastern Nevada Cattle Ranches (Excluding All Interest), 1928 to 1934, Inclusive

	Group I, 400-600 head	Group II, 600-800 head	Group III, 809-1,000 head	Group IV, 1,000-2,000 head	Group V, 2,000-3,000 head	All ranches average
Average number of cow units.....	401.96	548.26	809.84	1,097.71	2,374.01	899.25
Average number of head run.....	486	666	979	1,312	2,852	1,083
Death loss.....	5.77 %	3.64 %	4.08 %	4.72 %	3.30 %	4.09 %
Calf crop.....	63.41 %	64.82 %	59.46 %	59.90 %	71.41 %	64.20 %
Pounds of beef produced per cow unit (includes cattle inventory increase or decrease).....	179.77	248.05	231.80	223.02	250.14	232.64
Average price per pound received for cattle.....	\$0.05462	\$0.05462	\$0.05462	\$0.05462	\$0.05462	\$0.05462
Receipts—						
Sales of cattle.....	\$9.82	\$13.55	\$12.66	\$12.18	\$13.66	\$12.71
Other revenue.....	3.72	1.71	3.10	1.47	1.27	2.04
Inventory increase in feeds, etc.....	.47					
Total receipts.....	\$14.01	\$15.26	\$15.76	\$13.65	\$14.95	\$14.75
Costs—						
Taxes.....	\$1.30	\$1.47	\$1.22	\$1.25	\$1.63	\$1.39
Depreciation.....	2.46	2.25	1.75	1.46	1.66	1.78
Miscellaneous management.....	3.0	5.0	.44	.58	.43	.47
Purchased feeds.....	2.05	2.19	2.05	1.67	3.26	2.84
Parts and supplies.....	3.07	2.42	2.43	1.68	1.61	2.07
Paid labor.....	2.33	3.57	2.89	1.89	2.88	2.70
Unpaid labor.....	3.80	3.57	3.16	2.55	1.11	2.51
Inventory decrease in feeds, etc.....		.22	.06	.33		.09
Total costs.....	15.31	16.19	14.00	11.47	12.58	13.35
Balance.....	\$1.30	\$0.93	\$1.76	\$2.18	\$2.37	\$1.40
Pounds of beef produced per cow unit (Bul. 133, page 10, 20 lbs. higher than 28-34).....	199.77	268.05	251.80	243.02	270.14	251.94
Average price received (Bul. 133, page 11).....	\$0.0623	\$0.0623	\$0.0623	\$0.0623	\$0.0623	\$0.0623
Receipts—						
Sales of cattle.....	\$12.45	\$16.70	\$15.69	\$15.14	\$16.83	\$15.69
Other revenue (28-34 plus percentage of increase in cattle prices—14 %).....	4.24	1.95	3.53	1.68	1.45	2.32
Inventory increase in feeds, etc.....	.47					
Total receipts.....	\$17.16	\$18.65	\$19.22	\$16.82	\$18.28	\$18.01
Costs (by index numbers) — 28-34 plus 6.86 %.....	16.38	17.30	14.96	12.26	13.44	14.27
Balance.....	\$0.78	\$1.35	\$4.26	\$4.56	\$4.84	\$3.74

## LONG-TIME AVERAGE, 1910-1932

mean that ranchers of similar size and type have no place in American agriculture, because the unpaid labor allowance, together with the net earning power balance, may be sufficient to pay considerable interest and still maintain a satisfying standard of living for the owners. In the case of Group I the long-time unpaid family labor allowance was \$3.80 + .26 (6.86%) or \$4.06 per cow unit. Accordingly the owner has \$4.06 + .78 = \$4.84 per cow unit or \$1,945.68 to draw on for interest and principal payments and family living on the ranch. Therefore, if such a rancher is not too heavily in debt, it is entirely possible that he can provide a better living for his family on the ranch than he could at any other occupation, considering his training and ability.

GROUP V

2,374.01 cow units ; 2,852 head of cattle	
Earning power balance \$4.84 ÷ .06 =	\$80.66 investment value per cow unit
2,374.01 cow units × \$80.66	= \$191,487.64 complete investment value
2,852 head mixed cattle × \$30	= 85,560.00 cattle investment value
Difference.....	\$105,927.64

Group V earning power is therefore capable of carrying the cattle investment with a balance of \$105,927.64 to cover the investment in land and allied equipment. In this group fairly good range balance, coupled with volume production, reacts favorably on earning power.

The effect of change in public range privileges on the number of cattle operated may be illustrated in the following hypothetical cases:

1. Outfit with greater proportion of feed obtained from public range.

This ranch produces adequate feed and forage for 1,200 head of cattle for five months and grazes the remaining seven months on the public range. What will happen to the number of cattle this ranch can handle if it is allowed a six months' grazing season on public lands and the ranch is required to provide the other six months' feed?

In this case the limiting factor governing the number of cattle that can be operated is the amount of feed produced on the ranch, which amounts to 1,200 cattle for five months, or 6,000 cattle feed months. When required to spread this ranch feed over a six months' period, the number of cattle the ranch can handle is reduced as follows:

	RANCH FEED			PUBLIC RANGE FEED		
	Head	× Months	= Feed months	Head	× Months	= Feed months
From.....	1,200	5	6,000	1,200	7	8,400
To.....	1,000	6	6,000	1,000	6	6,000
Difference.....	200	1	.....	200	1	2,400

By shortening the grazing season one month on the 1,200 cattle, 1,200 feed months were saved on the public range. With this change in season the ranch production could only provide for 1,000 cattle for six months, or 200 head less than were originally operated, hence an additional 1,200 feed months on the public range are automatically conserved, totaling 2,400 feed months. However, if this outfit could adjust its ranching operation to provide 1,200 more feed months on the ranch, it could continue to operate 1,200 cattle.

2. Outfit with greater proportion of feed provided by ranch.

Obviously, the same general principle works both ways and if the 1,200-head cattle ranch had been providing feed for the cattle for seven

months on the ranch and grazing them five months on public lands, it could increase its cattle if allowed six months' grazing season on public lands.

	RANCH FEED			PUBLIC RANGE FEED		
	Head	Months	= Feed months	Head	Months	= Feed months
From.....	1,200	7	8,400	1,200	5	6,000
To.....	1,400	6	8,400	1,400	6	8,400
Difference.....	200	1	.....	200	1	2,400

In this case a one-month increase in length of grazing season causes an increase of one-sixth in the number of cattle that could be operated.

### 3. Outfit with public range forage the limiting factor.

On the other hand, the limiting factor governing the number of cattle that can be operated by a given outfit may be the amount of public land forage available. Even though the length of the grazing season may be satisfactory for use in connection with the ranch, there may be too many livestock grazed for range preservation. In this instance a theoretical reduction of one-sixth in the number permitted is assumed to be sufficient to preserve or rehabilitate the range forage.

	RANCH FEED			PUBLIC RANGE FEED		
	Head	Months	= Feed months	Head	Months	= Feed months
From.....	1,200	6	7,200	1,200	6	7,200
To.....	1,000	6	6,000	1,000	6	6,000
Difference.....	200	.....	1,200	200	.....	1,200

In this case the ranch is producing sufficient feed for 1,200 cattle, but on account of limited range, can only be allowed 1,000 on the public lands; hence it has 1,200 surplus feed months on the ranch. With this change, this outfit can either give more feed to 1,000 cattle, sell some hay or pasture, or run an additional 100 cattle on the ranch for twelve months to consume surplus ranch feeds.

Public range or open range of mixed privately owned and public lands replaces ranch pasture forage, which in turn replaces hay in the stack. Reserve ranch pasture forage, cured on the stem, can be used during the winter season at opportune times when the weather and snow situation is such that this forage is available for grazing. The longer the grazing season, either on open range or ranch forage, the shorter the hand-feeding season, and vice versa. A change in the length of the open range grazing season automatically causes a shift in the period of use of ranch forage and hay in the stack. It also automatically increases or decreases the period of time cattle are held on the ranch and the amount of feed that the ranch proper is required to furnish per animal unit.

Hand feeding is expensive compared to the cost of open range or ranch pasture forage. Therefore, if a shift of one month is made the change would usually increase or decrease the feed cost an amount equal to the difference between a one month's cost of the feed on the open range and the cost of hand feeds for one month on the ranch.

Clearly, these hypothetical cases show that changes in length of grazing season and size of permit affect volume production, which in turn influences earning power, as indicated in Table VIII. These three illustrations do not attempt to cover the complicated adjustments that may arise, but they do show what might happen to the cattle herd in a few simple cases.

The preceding tables and discussion show that a combination of good range, long grazing season, and volume production, coupled with a

ranch set-up capable of providing for the cattle during the hand feeding season, constitutes an operating unit of maximum earning power.

Accordingly, regulations that allocate numbers, length of grazing season and designate range locality virtually establish degree of ranch balance and the maximum earning power of the ranch set-up. Therefore, ranch and range balance in a large measure is dependent upon the rules and regulations governing the use of public land grazing privileges.

Along with the development of Forest Service regulations, the State passed range laws which fostered customary and priority use of stock water and the public domain. The Nevada range laws caused a premium to be placed on the ownership of springs, water holes, and isolated range lands on account of the public range control attached thereto. The Forest rules making permits transferable with livestock sales caused a premium to be placed on permitted livestock. Under the existing situation, with the competitive use of the public range by cattle and sheep and the fact that range sheep production requires little or no cultivated ranch lands, market values of improved ranch property became depressed while a premium was being paid for stock water, springs, wells, isolated range control areas, and livestock that carried National Forest permits. Since the general practice has been to make separate loans on land and livestock, periods of liquidation further aggravate this situation because sales of chattels carrying permits separate the grazing privileges from the real properties, to which they were formerly attached.

These conditions, along with depression, drought, and varying degrees of range depletion, have resulted in an amazing number of unbalanced ranching enterprises on the Ruby division and elsewhere, since the costs incidental to improved real estate ownership, such as taxes, interest, labor, machinery purchases and upkeep, cannot be unduly stinted without ranch impairment. The net result is the unstable ranch land situation indicated in Tables IV to VI, inclusive.

Obviously, if balanced operations of ranch and range are to be set up, grazing rules and regulations of necessity must point in that direction. The question immediately arises, Is there sufficient public range available to balance the privately owned properties and thus set up sound ranch and range operations? The first step will be to determine the yardstick for measuring the commensurability offered by stockmen. Once established, its application involves size of permit and length of grazing season, upon which earning power so largely depends. In all probability, the goal will be to preserve going-concern ranching enterprises on a sound basis and to lay a foundation that will make it possible to rehabilitate and stabilize the unbalanced ranches that qualify for grazing privileges. A conflict of interests is apt to arise the moment unbalanced ranch properties apply for range. Even though permitted numbers and the length of the grazing season should remain unchanged from the customary practice, going-concern outfits can be expected to oppose the entrance of livestock not now on the range. Should it become necessary to cut numbers or shorten the grazing season of some ranches to make room for the balancing process, then the maximum earning power of such set-ups would be correspondingly reduced, which could not escape their aggressive protest.

In the allotment of public range, any ranch that does not qualify for range privileges satisfying the requirements of a balanced operation cannot be valued in excess of what its maximum earning power justifies, namely, the net revenue of a ranch with inadequate range privileges. Such a ranch of necessity must resort to considerable self-contained production. The history of the ranching industry with its many failures when production on a self-contained basis was attempted, is ample evidence that Nevada range livestock production solely on a deeded land basis is seldom profitable. The distressed financial situation of ranches depending on the sale of hay and pasture in this range country indicates that such a business is not dependable or stable. The revenue from sales of hay and pasture has generally proved inadequate to support the investment and costs involved. Pasture rentals and privately owned grazing leases are usually subject to the competition of the use of public lands and influenced by grazing fees or costs attendant to such use. Obviously, ranch land with a range deficiency cannot support the same loan or tax valuation as ranch land adequately balanced with range privileges.

Cattle ranch stability involves the preservation of the range and its proper use in connection with improved lands and livestock. Under the present set-up, the stockman usually deals with the Forest Service for at least a part of his summer range, the Interior Department for another part, the Federal Land Bank for his land loan, and one of the Government-sponsored loan agencies for his livestock loan. The balance and stability of his enterprise is largely dependent upon the functions of these agencies which, as far as he is concerned, are related and interdependent. The rules and policies which govern the administration of these agencies ordinarily shape the plans of the average rancher and determine whether he can work out a balanced unit by attaching grazing privileges and livestock in a manner conducive to the practical and profitable use of his deeded lands.

The surprisingly large number of unbalanced cattle outfits existing in different localities presents a most complex problem, the solution of which calls for a thorough understanding and far-sighted view of the situation by all agencies concerned. Of course, it also involves the willingness of the ranchers and stockmen to cooperate in working out a practical solution.

When ranch and range balance for a given area has been worked out, tried and proved conducive to stability, then such range privileges could well be attached to the commensurate properties in the form of term permits, provided that the recognized range rules are adhered to and the initial qualifications attendant to the dependent properties are preserved. The chief object of a term permit would be to give the permittee assurance of an approved grazing privilege for a prescribed time, thus strengthening the stability of his enterprise.

The tables and comments herein show the complexity of the problem at hand and are presented in the hope that they will be of value in its solution.

In the transition period ahead it is hoped that rules and regulations governing grazing on the public ranges will be based upon a sound land policy that will build up ranch stability, safeguard the welfare of the range livestock industry, and insure range preservation.

