

Grazing Resources and their Utilization on the Wallowa National Forest

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It had always been the custom for settlers to graze their stock on the vacant public lands near the settlement without supervision or restraint, and it naturally followed that when National Forests were created and the areas closed to certain classes of stock and the grazing of all stock restricted, much opposition arose. Prior to 1897, all National Forests were closed to sheep grazing, on the supposition that this class of stock was injurious to the forest cover. This was true to a certain extent, but the damage in most cases was due to the method of handling the stock. In 1897, the forests in Oregon and Washington, and later the other National Forests, were opened to sheep, and since the advent of the regulated use of forage, there has been very little material damage to the forest cover, and the almost depleted ranges are gradually returning to their normal vegetative cover.

It is true that we must have trees and lumber, but we must also be fed and clothed, and the meat and wool producing powers of the forage on the National Forest lands is too great to be lost sight of. According to the Forester's report there are at present some 7,280,000 sheep and goats, and 1,725,000 cattle and horses and their additional increase, which range on the National Forests. Grazing should, therefore, not be considered as an accident to National Forest administration, but as a legitimate aid in capitalizing an enormous forage resource, and an important adjunct in the proper control of fires.

Up to the present time, the utilization of the grazing resources has been the major activity on the Wallowa National Forest. While there are some fairly large bodies of good timber here, there has heretofore been no call for it except a

limited amount for local consumption. Now, however, a timber sale of approximately 120,000 M. B. F. is under way. The larger portion of the area of this Forest is chiefly valuable for watershed protection and the forage over the entire area.

The geological formation and consequent topographic conditions of this region are in a large measure responsible for the value of this Forest from a grazing standpoint.

The entire Forest is part of that great lava flow known as the Columbia River plateau which covers 250,000 square miles of this northwest territory. This great lava flow surrounds several prominent mountain ridges which stand out boldly. Of these mountain ranges, the Wallowa mountains are mostly within the boundaries of this Forest.

The entire Forest lies within the Snake River drainage area—Snake River itself forming the 70 miles of eastern boundary. Along the boundary the river has a comparatively low elevation of from 900 to 1600 feet above sea level. From Snake River the elevation rises by successive stages to about 10,000 feet in the Wallowa mountains with a consequent variation in climate. It is this variation in climate that makes this Forest of particular value from a grazing standpoint.

The precipitation of the region varies from 12 inches at the lower altitudes to 30 inches or more on the high mountains, and either dry farming methods or irrigation are resorted to on the ranches within or adjacent to the Forest.

While the timber values of this region are great, it is probable that the community and its development are more dependent on the stock-raising industry than on any other one thing, and the forage on the National Forest lands is the greatest item in the stock-raising industry of this region, comprising, as they do, a large percent of the available range. Previous to the creation of this Forest there was a mad scramble for the range, without system or regulation. This state of affairs continued for years with a consequent depletion of ranges and a gradual diminution of the forage resources on which the community development is dependent. It is safe to say, that had not the National Forest been established and grazing regulated, much of the available range would have been ruined.



A valuable product of the National Forests. A flock of young sheep ready for shipment.

The grazing plan for this Forest for the coming year recommends that 19,000 cattle and horses, 105,000 sheep and 100 swine be allowed to utilize the ranges on this Forest, which in itself is an indication of its forage resources.

The range as a whole may be roughly divided as follows:

Summer, cattle and mutual, (includes spring and fall sheep range	380,000 A.
Summer sheep range	320,000 A.
Winter cattle range	150,000 A.
Winter sheep range and lambing grounds.....	160,000 A.

The northern portion of the Forest, comprising about 13 townships, is mainly a plateau area, from which the drainage flows southerly into the Wallowa valley, or northerly into the Snake River. This plateau area has been only slightly dissected by erosion, and only a few deep and prominent canyons are to be found in this region, and these do not grow deep until they near the northern boundary of the Forest. It is on this area that the accessible merchantable timber is to be found.

To the east and south of this plateau area lies Snake River and its tributary canyons. This area is geologically similar to the northern plateau, but is more deeply dissected, and while some fairly large flats occur in the region, it as a whole consists of long narrow ridges and deep canyons, with narrow valley floors. From Snake River the walls of the canyon rise more or less precipitously to a height of from 5000 feet to 7100 feet above sea level. Numerous bench areas are to be found in the canyons, parts of which are suitable for agriculture. This deeply dissected plateau area leads up to the Wallowa mountains which are very rugged and large areas are barren or at best support but a scanty plant growth.

Roughly, the Forest lies in the shape of a horseshoe surrounding the Wallowa valley and the rolling hills to the east of it, to which the major portion of the settlement of this region is confined.

The summer cattle and mutual ranges, parts of which are used as spring and fall sheep ranges, are confined to the more accessible timbered northern plateau area, and the larger of the flats in the more deeply dissected region lying to the

east and south. Some of the larger flats are also used as summer sheep range.

The types on the summer cattle range may be divided into three broad classes, grass, browse and weed types, in order of importance, all being timbered types. On the northern plateau area the larger percent of the area consists of an almost pure stand of pine grass, and in point of area, it is also probably the most important type on the Forest. The composition of a typical pine grass type is about as follows:

PINE GRASS

		Per Cent			
Surface supporting vegetation.....		90			
Average density		80			
Palatability		60			
Timber, yellow pine, Douglas fir and larch.					
GRASSES 70%		WEEDS 15%			
		BROWSE 15%			
	%	%			
Pine grass	90	Alum root	25	Chaparral	25
Koeleria	10	Arnica	20	Large huckleberry.....	20
		Bluebell	5	Spiraea	10
		Yarrow	10	Willow	15
		Everlasting	10	Kinnikinnick	30
		Clover	10		
		Lupine	10		
		Geranium	10		

Of the browse types the large huckleberry and small huckleberry are by far of greatest importance on the summer cattle range and spring and fall sheep range, though the browse types along the creeks are in the aggregate quite important, and help to make up a proper balance of the different classes of forage on any allotment.

The following may be taken as typical browse types:

LARGE HUCKLEBERRY

			Per Cent
Surface supporting vegetation.....			70
Density			90
Palatability			60
Timber: Lodgepole pine.			
GRASSES 5%		WEEDS 5%	SHRUBS 90%
Pine grass	Clover	Large huckleberry	
Sedge	Strawberry	Willow	
	Potentilla	Sevenbark	
	Arnica		

BROWSE (Along Creeks)

	Per Cent
Surface supporting vegetation.....	90
Density	70
Palatability	30

GRASSES 15%

WEEDS 15%

SHRUBS 70%

		%
Pine grass	Aster	Thimbleberry10
Sedges	Potentilla	Currant10
Bromus	Senecia	Mock orange20
	Clover	Gooseberry10
	Arnica	Spiraea 5
		Servicberry10
		Willow10
		Maple10
		Rose 5
		Alder10

SMALL HUCKLEBERRY

	Per Cent
Surface supporting vegetation.....	60
Density	40
Palatability	30
Timber: Lodge pole pine.	

GRASSES 10%

WEEDS 15%

BROWSE 75%

Pine grass	Lupine	Small huckleberry
	Fireweed	
	Anophilus	
	Arnica	

It may be said of the small huckleberry type, that it is practically worthless from a grazing standpoint, and it occurs principally on the higher spring and fall and some of the summer sheep ranges in the neighborhood of the high mountains.

In the spring and early summer, as soon as the forage on the respective ranges has attained a sufficient growth to prevent excessive injury by grazing and trampling, the stocks are allowed to drift or are driven from the low winter ranges onto the higher ranges. This generally takes place during April and May for cattle, and the sheep go on the summer range in late June or early July. The type of forage on this class of range necessitates that it be used as early as possible, since pine grass in its early stages of growth is quite palatable and succulent, but later on as the dry summer weather continues, pine grass becomes more harsh and loses its palatability and forage value to a large extent, and while the stock do not relish it under these conditions, they will graze

it when forced to do so. Supplementing the pine grass type and adding much to the forage value of the entire area are the different shrubs and weeds which are found in mixture with the pine grass in the pine grass types and the more or less pure types of browse and weeds, the composition of which have been previously given. These supplemental types are to a large extent responsible for the value of this class of range, since they maintain a proper balance between the different classes of forage, and increase the value considerably.

It has been noted on this Forest in two widely separated areas that where pine grass has been heavily overgrazed, a species of small clover supplants the original pine grass type to a large extent. This condition has increased the carrying capacity of these ranges to a considerable extent, since the clover type which has come in is much more palatable than the original pine grass type, and remains palatable for a greater period of time, and grows up again in a short time after being grazed, if moisture is to be had in sufficient quantities. This case is practically the only one where it is known that overgrazing in any form is beneficial in any way. Generally, overgrazing causes a diminution of the more valuable forage plants, and an increase in the percentage of less valuable species.

Cattle and horses occupy the summer range from about May 1 to October 31, and the efficient use of the range by this class of stock depends upon the method of handling. Horses and cattle, not being under constant supervision as are sheep, naturally occupy the areas easiest to graze. In the beginning they are distributed over the range as evenly as possible and their future movements are regulated as much as possible by drift fences supplemented by occasional riders, and to a larger extent by watering facilities and the proper location of salting places in relation to available water. During the summer season cattle require about 10 pounds of salt per head, and should they receive an inadequate amount they will not do their best, and become uneasy and travel too much and will not put on fat, nor will they use the range to the best advantage. It is possible by correct location of salting grounds to force the cattle traveling between salting and watering places to

utilize much range that they would not go over if salting grounds were not correctly located. The development of watering places is also a great asset in the proper utilization of the range in this respect.

Sheep using the summer cattle and mutual ranges use their allotted portions first early in the spring, shortly after lambing, thus supplying the tender feed much needed to keep the ewes in good milk-giving condition, and to supply the lambs with succulent forage which is necessary during the first few months of their existence. On the supply of tender forage at this period depends to a large extent the growth and development of the lambs. When the snows have melted on the high mountain sheep ranges and the areas at the foot of the mountains, the ewe bands with lambs leave the summer mutual ranges for the high summer ranges, where they continue to have an abundance of tender palatable forage.

In the fall when the sheep have been driven off the high summer ranges by the snow, the ewes and the remaining lambs (some of the lambs having been cut out and sold) are driven back onto the mutual ranges to utilize such portions of the range as have not been fed off by the cattle and horses.

Though sheep utilize, during the summer months, much of the range previously described, the typical summer sheep range is confined to the high mountains whose difficulty of access and ruggedness precludes the use of the area by other classes of stock, though there are areas—especially the basin areas at the head of streams—which are covered with excellent forage, and which could be easily utilized by cattle.

The sheep are driven to the high summer ranges about July 1, utilizing first the lower slopes and canyon bottoms, and progressing upward as the heavy winter snows melt, and the forage develops.

It is rather difficult to make a general classification of the types in this region, but a few of the more important ones will be outlined. First in importance from a forage value standpoint comes the mountain bunch grass type, the principal forage plant of which is mountain bunch grass (*Festuca viridula*).

MOUNTAIN BUNCH GRASS TYPE

	Per Cent
Surface covered	60
Density	80
Palatability	80
Timber: Scattered white-bark pine, lodgepole pine and alpine fir.	

GRASSES 70%	WEEDS 15%	SHRUBS 15%
Festuca	Everlasting	Sage
	Yarrow	
	False alum root	

GRASS-WEED TYPE (Found along some streams)

	Per Cent
Surface cover	90
Density	90
Palatability	80
Timber: Scattered mature Douglas fir, western larch, Engelmann spruce, and seedlings, saplings and poles of lodgepole pine, western larch, Douglas fir and Engelmann spruce.	

GRASSES 70%	WEEDS 30%
Wheat grass	Anophilus
Cheat	Drymocallis
Blue grass	Nettle
Tickle grass	Niggerhead
	Meadow rue
	Dandelion
	Geranium
	Yarrow
	Fire weed

GRASS (Timbered)

	Per Cent
Surface covered	80
Density	80
Forage plants	80
Timber: Lodge-pole pine, white and Douglas fir.	

GRASSES 60%	WEEDS 40%
Fescue	Pentstemon
Pine grass	Wooly weed
Blue grass	Alum root
Sedges	

MEADOW TYPE (no timber)

	Per Cent
Surface covered	100
Density	100
Palatability	70

GRASSES 35%	SEDGES 35%	WEEDS 25%	SHRUBS 5%
Poa	Various species	Drymocallis	Mountain heath
Agrostis		Gentian	
Others		Strawberry	
		Others	

BROWSE TYPE

	Per Cent
Surface covered	100
Density	90
Palatability	50
No timber. (Scattered Douglas fir saplings.)	

GRASSES 35%

Pine grass
Bromus
Rye grass
Fescue

WEEDS 25%

Columbine
Sego lily
Geranium
Yarrow
Senecio
Peavine
Paint brush
Valerian
Strawberry

SHRUBS 40%

Aspen
Willow
Ceanothus
Buckbrush
Large huckleberry

WEED TYPE

	Per Cent
Surface covered	60
Density	70
Palatability	50
Timber: White fir, lodge-pole pine, Engelmann spruce.	

GRASSES 20%

Blue grass

WEEDS 60%

Meadow rue
Monkshood
Valerian
Saxifrage
Strawberry

SHRUBS 20%

Small huckleberry
Currant
Spiraea
Serviceberry

The return from the lamb crop is largely dependent on the handling of the ewe bands with lambs on the summer ranges. It has been noted on this Forest that lambs from two different bands of the same breed of ewes having equal chances on like ranges have in the fall differed in average weights as much as 17.7 pounds. This difference in weight can therefore be due to one thing, that is, faulty handling of the sheep. It might also be said here that lambs grazed outside the Forest weighed 64 pounds, while those grazed inside the Forest on like range weighed 67½ pounds at selling time. From the summer ranges the sheep are driven back to the lower fall sheep and mutual ranges, and in this way are able to utilize the forage not touched by cattle during the summer. Neither the ewes nor the remaining lambs are, at this time, so much dependent on succulent forage for proper growth and development, and can therefore utilize the left-over areas to good advantage. Here they remain until the snow forces them to seek the open winter ranges at the lower altitudes.

A large percent of the winter range of this region is within the Forest boundary, and lies along Snake River and the deeper of its tributary canyons. The small amount of precipitation at the lower elevations at which the winter range lies precludes the growth of much timber, and consequently the range is all of an open bunch grass type, the composition of which is in the main largely as follows, varying to a certain extent on account of the directions of the slope which it occupies:

OPEN BUNCH GRASS TYPE

	Per Cent
Surface cover	90
Density	90
Palatability	80
GRASSES 70%	
Wheat grass	
Koeleria	
Carex	
WEEDS 20%	
False alum root	
Yarrow	
Lupine	
Club moss	
Potentilla	
SHRUBS 10%	
Serviceberry	
Rose	
Tassel bush	
Maple	

The value of the winter range, as far as the forage value of the types is concerned, is all in all nearly equal, but the direction of the slope is the one salient feature about the winter range that must be taken into consideration in allotting the range and the handling of the stock thereon. Slopes having a northerly exposure are naturally cold, freeze up early and remain frozen during the colder winter months, which prevents the new growth of grass to a very large extent. It is a peculiar fact that the grasses on the north slopes have a carrying capacity of not more than half that of the south slopes; while no investigation has been made to determine the truth of this statement, it is well known to stockmen that the slopes with a northerly exposure being frozen are dangerous for stock to encroach upon, because of the danger of sliding and consequent loss. On the winter range each band of sheep have an individual allotment, as they also do on the summer ranges.

The method of handling cattle on the winter range differs widely from the method used on the summer range. In allotting the summer range, allotments are large and are used jointly by a group or an association of permittees. The winter

cattle allotments are individual; that is, each permittee is allotted a piece of winter range as near his home ranch as possible, so as to enable him to look after his stock during the dangerous winter months, and develop his range to the best advantage, and so that he may eliminate to a large extent any loss by sliding, by fencing off the slopes where loss by such accident is liable to occur. By having his stock confined to an area near the home ranch during the winter months, it is a simple matter for him to collect the animals and feed them hay or other forage crops raised on the ranch, should occasion demand.

The amount of winter range being inadequate in proportion to the summer range, it is necessary that a large part of the stock grazing the summer ranges be driven to the ranches in the valley and surrounding foothills to be fed during the winter.

To illustrate some points of management and utilization and some of the results obtained for Forest Service administration, there is inserted here what Ranger Winniford has written about the Snake River Live Stock Association.

"A particularly good example of the beneficial results of stockmen working under the Forest Service administration, is on the Snake River range. Formerly there was very great uncertainty in the livestock industry on this range, regarding both summer and winter feed, and the effect was almost as bad on one range as on the other. This condition was due to two causes: first, the use of the winter range during summer. There were few, if any, drift fences, and the cattle were left on the range in the spring until they drifted back up the mountain side on to the summer range. There was very little incentive for a man to drive his stock out on the summer range, for his neighbors might object to the added expense and labor of keeping his stock on the mountain, or he might fear too great a loss, so that he would keep them around his ranch all summer, and let them drift back and forth over and ruin the range which should have been saved for winter. Fencing on the public domain was not allowed by law, and was therefore not resorted to. The range was therefore used just as it happened, without regard to when it was ready to use, or

economically most valuable. Second, on the summer range there was sharp competition between sheep and cattle, and the cattle were never able to put on fat. Then when they came down on to the winter range they were poor, and the range was bad, and many of them died from poverty, or slid off the steep hills and were crushed to death. No one expected to get any beef off the range. The administration of the Forest legalized drift fences, and this made it possible, not only to protect the winter range against destructive summer grazing, but to allow each permittee to protect his own winter allotment and build within it such drift fences as were necessary to keep the stock off dangerous sliding ground, and to so handle his stock as to secure the greatest amount of good from the use of the range. It also eliminated competition, protected the summer range for the stockman, insured the continuity of his business, and the fruitfulness of it. For some years each permittee was busy improving and developing his winter range. His stock now leave the winter range in good shape, but it was noticed that big steers, and in some cases, dry cows, did not put on enough fat during the summer to tempt the cattle buyer. Something had to be done. The Service encouraged the building of big drift fences which would separate the beef cattle from the stock cattle during the summer, and more uniform salting. It was a community matter, for the range was used in common by all the stock, and one permittee could not do the necessary work. An association was formed, and authorized the construction of the fence, which was built, and this served the purpose well, but it had to be paid for, and this disrupted the association, for the people were hardly ready for the progressive by-laws of the association. The association was pretty thoroughly dead, but the drift fence was working right along, and its good effects were so evident that as time went on the minds of all became more and more impressed with the good that it was doing, and at length the fence began to assume the form of a public necessity. Then came a time when it needed repairing. Everybody said so, and there were corrals to be built and repaired, business had been prosperous, so why not put up a good cabin at the head camp? The psychological moment had ar-

rived for the revival of the stock association, and the improvement of the summer range, if only the lid could be held down. The service encouraged the unenthusiastic, plead with the tight wads, and checked the radicals, and tried to harmonize the various elements. They were told that a permit for any special use would have to be held by the stock association if it was to be located on the summer range. The Stock Association was dead, it is true, but why not revive it? They did. They provided for more salt for the cattle, they planned water troughs, and made yearly programs for handling stock and using the range. They were all ready for the by-laws of the Association, and they felt at this time, with a recognized Advisory Board, the Stock Association could take a hand in grazing affairs. This gave the permittees a feeling of confidence. It began to look as if the beef cattle would always be of a quality that would demand a good price. Then why not further increase the price by breeding the stock up to a better standard, since better stock brought in better profits, and greater profits brought greater enthusiasm in the business. Now they are vying with each other in suggesting improvements that can be made to benefit the range, and make the work of riding easier, so that still more time can be spent in improving conditions on the range. Prices are better now, and while this may be due entirely to market changes, no one hesitates about buying Snake River Stock, because they are a better grade than formerly. They are fatter than they used to be, they were never poor or hungry in their lives, their ranges are protected winter and summer, and their owners have confidence enough in their quality to demand the highest market price. Snake River steers sold as tops on the Portland market this fall. Conditions are still a long ways from ideal, but to deny that the administration of the Forest contributed anything to their betterment would be to deny that they have changed for the better at all."

The Forest Service administration of grazing lands has made it possible for the various sheepmen as well as cattlemen to plan definitely for the future, with the assurance that they will be allowed the more or less continuous use of the same range from year to year. This has stimulated the im-

provement of the range by the permittees themselves in the building of trails, and the development of watering places in co-operation with the Forest Service to open new and formerly unused range. Due to regulation, the former waste in the use of forage has been stopped. By assigning permittees to definite allotments, and by regulating the time that each camp on an allotment is to be used, the greatest good compatible with economic results is now obtained from all the range.

The educational features of the Forest Service administration should not be lost sight of. By experiment and by co-operation with the stockmen in all parts of the west, various problems in methods of handling stock on the range have been worked out, and are being brought to the attention of the users of the range. Among these problems may be mentioned:

1. Water development.
2. Salting; amount required, and best location for salting places in relation to watering facilities and forage.
3. Deferred and rotation system of grazing.
4. Bedding-out system of handling sheep.
5. Poisonous plant studies.
6. Forest Service influence in the destruction of predatory animals.

The regulation of cattle and horses on the various ranges by drift fences built through the co-operation of the members of the various live stock associations, has resulted in a great saving of time, money and forage, and in a considerable gain in beef.

The following figures taken from the Annual Grazing Report for this Forest will show approximately the value of the forage resources of the Forest to the community:

"The Forest will carry 6000 head of cattle yearlong. At 3 years of age they will be worth at the present market price, \$60 per head, or \$20 per year for the three years. This would amount to \$120,000 for the cattle under year-long permit. 12,000 additional cattle can be cared for during the period from April 1 to November 30. As it would cost about \$15 per head to carry them through each of 2 winter seasons, this would leave \$10 yearly value through each of 3 years,

for the National Forest forage consumed, or an annual revenue of \$120,000. There is range for 34,000 head of sheep yearlong, and for 66,000 additional sheep during the season from June 1 to October 31. It will cost \$1 per head to feed these sheep during the remainder of the year. At two years of age each sheep would be worth, using present prices as a basis, \$5 per head, and would have sheared 15 pounds of wool at 20c per pound. This would make each sheep yield \$8 at two years of age, or \$136,000 for the yearlong sheep, and \$462,000 for the sheep grazed part of the season, or \$299,000 for one year. The grazing resources then will produce beef, mutton and wool valued as follows:

Cattle grazed yearlong	\$120,000
Cattle grazed during part of year, less amount re-	
quired to carry them balance of year.....	120,000
Sheep grazed yearlong, including 7½ lbs. wool each	68,000
Sheep grazed during summer, less amount to carry	
them balance of year	231,000
	<hr/>
	\$539,000''

The Wallowa Forest and its adjoining agricultural lands in Wallowa County may then be described as an excellently balanced grazing unit, capable of supporting, when fully developed and utilized, 120,000 head of sheep and 25,000 head of cattle and horses. The farm lands depend upon the Forest ranges for the profitable utilization of their products, and without these products the stock could not so profitably utilize the forest ranges. There is enough hay raised to supplement the winter range and feed the farm stock, so there is practically a continuous balance in farm and forest during the entire year.

In 1915 the Forestry Club of Iowa State College became a member of the Inter-Collegiate Association of Forestry Clubs. T. W. Rehmann, who was elected local vice-president of the national organization, will represent Ames at the next convention of the association to be held at Seattle, Wash., in November, 1916.