

Fort Defiance, Arizona.
October 12, 1928.

MEMO OF INSPECTION FOR J. P. KINNEY, CHIEF SUPERVISOR
OF FORESTS, WASHINGTON, D. C.

Part of the months of August and September 1928, was spent on the Southern Navajo Reservation on Grazing Reconnaissance. During this time enough of the timbered portion of the Reservation was covered to enable one to get a good idea of existing conditions. In view of the data collected, I wish here, to set down some of my general impressions for what ever value they may be to the Administrative Officers, particularly for consideration in connection with existing grazing conditions and methods of remedying same. The Supervisors further indulgence is asked in the many points which I have taken up in this Memo, which are not strictly Grazing, but which must be given consideration.

GENERAL STATEMENT:

The Southern Navajo Reservation is located in Northwest New Mexico and Northeast Arizona, and contains approximately 3,000,000 acres, all or most of which is tribal land. The Reservation is a closed Reservation and consequently is in it's infancy as regards development. Practically all of the Reservation is used at some time for Grazing purposes, although only about one third of it is of any value. The Southern Navajo Indian has in the neighborhood of 365,000 head of goats and sheep, saying nothing of the thousands of horses and cattle. This would only allow about two and one half surface acres per head, which is far too little for good management.

The ranges of the Southern Navajo Reservation are used by the Indian in the production of mixed stock, mostly goats and sheep, from which the Navajo Indian depends, almost entirely for his livelihood. Range management in any form has never been undertaken and the Indian has always had free and unrestricted use of the ranges. This condition along with climatic conditions has led to a much overstocked and overgrazed range, unavoidable but never the less true.

CLASS OF STOCK:

Stock of all kinds are permitted to run on the Reservation and no serious attempt has been made to set aside areas for certain classes and kinds of stock. Due to the fact that there is now a considerable percentage of weeds on the range I do not favor any change in the policy relative to sheep and goats.

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The weeds are of low palatability and their presence on the range is largely the result of too heavy stocking or to poor soil conditions or to both. The range is suited to and is needed by sheep and goats and improvement in the grass-weed percentage should be sought by lighter stocking and by deferred grazing. Goats destroy all young seedlings, as fast as they come through the ground and this condition can only be remedied by the methods mentioned above.

A considerable number of horses chiefly of poor quality run on the Reservation. Horses are considered harder on the range than other stock and it is also inadvisable to run both horses and sheep on the same range. In my opinion the horses of the range should either be segregated or disposed of as soon as possible without undue hardship to the owners. The canning and reducing factories will undoubtedly take care of a great many of them in the future.

GRAZING SEASON:

There is, generally speaking a year-long grazing season on this Reservation. The hills or mountains are grazed during the summer months and the flats or deserts are grazed during the winter months and in fact all the year round. If all grazing could be confined to the higher elevations during the summer months and leave the flats or deserts for winter grazing, conditions would be greatly improved. Stock had been running on all ranges for at least two months when I arrived and everything was closely cropped, so I have reason to believe and it is quite possible that along with over-stocking, the stock were admitted to the upper ranges at too early a date. Seasonal studies should be made to determine correct dates for Grazing Seasons. It is of my opinion however, that except for a few areas, the condition noted was due to too heavy stocking during the growing season and not to too early grazing. This can be checked next spring when I can be on the ground and determine the exact date of Vegetative Readiness.

CARRYING CAPACITIES:

Definite recommendations on carrying capacities for each unit will be made in a management plan which should be worked up in the immediate future. The Reservation as a whole has been considerably over-stocked, and particularly, near water holes it has been badly over-grazed. Reductions should be made in the number of stock permitted on a given unit. The forage here factor is very low and it will take three to four times as many surface acres to support one head as it should under normal conditions.

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It was noticed that on certain areas, (far from water), that the forage was much heavier and better than it was in the immediate vicinity of water. This will lead to the necessity of having wells or reservoirs distributed over the ranges for watering purposes. The approximate location of these reservoirs can be designated in a working plan of the area's.

FACTORS AFFECTING CAPACITY:

Since the heavy stocking has apparently been in effect for years, it may be advisable to discuss this feature at some length. Undoubtedly at some previous period the Southern Navajo Reservation was covered with a luxuriant stand of bunch and blue stem grasses comparable to a few existing patches in the immediate vicinity. Fires occurred more or less frequently and burned over considerable areas. Cooperation in the early days was not good, stockmen favoring the burning of the dead grass on the assumption that it improved the range. This has been proven to be a very erroneous assumption but never the less the humus burned from the ground at that time has never been replaced, and consequently plant reproduction was decreased to a great extent.

Heavy grazing has without a doubt decreased the fire hazard; but has the loss in forage value been offset by the decrease in the fire hazard? I say; No.

With increased forage production there would undoubtedly be a greater average annual area burned over on the Navajo Reservation, under normal grazing, than there is under the present over-grazed condition. Some Scrub Oak and small Pine will burn and if the reduced volume production of the vegetative cover were the only debit chargeable to this method of fire protection, it could perhaps be justified. It is not so simple.

EFFECTS OF OVERGRAZING:

The chief harmful features of the present over-grazed condition of the ranges are; erosion, loss of soil fertility, quick run-off, silting, drying and reversion of forage to lower successional stages, along with the reduced grazing capacity.

An examination of the soil shows a light colored soil to be exposed, and it's surface strewn with gravel and rocks. On the site examined there was an appreciable amount of boulders above the soil line. These facts alone, in themselves indicate sheet erosion.

Less moisture penetrates the compact soil of the over-grazed areas and the closely cropped surface offers little

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resistance to the quick run-off of the standing water in the heavy rains so characteristic of this region.

The finer, more fertile, moisture retaining parts of the soil and larger particles as well are removed by the beating rains and are readily carried off in this large volume of water, unchecked by debris, to find their way eventually into the gullies and watering places of the adjoining lower elevations.

The relatively small amount of moisture which does enter the compact soil of the over-grazed areas is the more readily given off by evaporation on account of the low humus content of the soil and the exposure to sun and wind.

Studied in connection with the amount of rainfall in this region during the main growing season, this failure of the soil, exposed to wind and sun and lacking in the water retaining humus, to absorb and retain the moisture of heavy rains is of serious consequence. Plants have their certain moisture requirements which differs for each different species. The moisture requirement varies both in amount available at any one time and in the length of time for which the water is available. When the average available moisture falls below the requirement of one plant, another less exacting takes its place. It is quite possible that in connection with overgrazing, that this drying or failure of the available moisture content of the soil may have been quite important in the change in forage which has taken place on the Reservation.

Periodic droughts are important on the Southern Navajo and it is during these periods that the reduced moisture content of the soil is most injurious. If the heavy stocking is maintained during the drought period and the year or two immediately following; which condition can not be avoided, serious impairment of the forage must be expected. Better species, that have until the drought, survived or grown fairly well, may die out completely, or in part.

Spring growth in Perennials is from food stored in the underground portion of the plant during the preceding season and for large volume production a large root surface is essential. When the green parts of perennial plants are kept much restricted throughout the growing season, this root production and storage is contracted to the size permitted by the growth above ground. If sufficient leaf surface is not allowed during the growing season to store plant foods and to maintain a large root area, spring growth

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the following year will be retarded and the volume production during the entire year will be much reduced. This fact is best illustrated by photos taken of a fenced private pasture and the adjoining range on the outside of the pasture fence. The more vigorous growth in the private pasture is undoubtedly due to the fact, that these plants have not been reduced in vitality as have those on the outside area. Lighter stocking on the range during the main growing season will increase the vitality of the plants and also the net carrying capacity of the range.

Just what part of the present forage condition on the Southern Navajo Reservation is due to erosion, to reduced soil fertility, to decreased moisture content, to periodic drought, to impaired vitality or to change in species of the plants is not important if it is recognized that changes in the forage cover and in the soil have taken place; that these changes have been toward a lower rather than a higher type and that their total effects are not justified by the reduced fire hazard. The controllable factors in all, is the number and management of the stock and the season they graze.

UTILIZATION:

While the Reservation as a whole and especially the open park areas are badly over grazed; it is of my opinion, that; if the dependent stockmen can, without serious injury and losses to themselves, so arrange their business as to reduce the normal stocking (to be computed) of the higher ranges by approximately one half, during the growing season from about April 1st to July 15th, a greater number of stock can be permitted during the rest of the grazing season, than will be possible if the range is to be more heavily used during this period. If this reduction during the growing season can be made on the ranges now overgrazed, no other system of deferred grazing will be needed and probably no other reduction in numbers. Utilization should be conservative on the part of the Defiance Plateau and especial attention will have to be paid, as regards the Yellow Pine reproduction on this area.

In view of the small amount and the condition of the Yellow Pine reproduction on the Defiance Plateau, I would recommend that; when timber operations are commenced on this area, that all brush be lopped and scattered. This will give an added protection to reproduction as well as to forage plants, and I believe that the value received will more than offset the additional fire hazard incurred by same. This fact (of protection) is clearly illustrated by the accompanying photos.

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POISONOUS PLANTS:

There is one poisonous plant on the range that is proving to be a menace, namely the Pingue, or Colorado Rubber Weed, (*Homenoxus Floribunda*). With improved range conditions this plant would cease to be a menace, for the reason that sheep and goats will not eat this plant if there is any other available palatable forage on the area.

RANGE IMPROVEMENTS:

Water development is the one thing that should be carried out on the Reservation. There is enough run-off of water, so that if it could be properly stored (in reservoirs) a more equal utilization of the range could be incurred. It is doubtful at this time if the benefits derived would warrant the expenditure. Mapping of needed water development should be done in the future.

Deferred grazing on most of the ranges during the growing season, is practicable, but especially on the more badly over-grazed areas, combined with conservative stocking and proper distribution, will, I believe, restore the Southern Navajo Ranges to a much better forage condition. On the other hand; if the Navajo Indian can not be made to conserve the range it will only be a matter of a few years before the ranges will be entirely depleted.

GRAZING AND GAME:

There is not any great amount of wild game on the Reservation so that there will never be any necessity of setting aside areas for the protection of wild life. Coyotes, bear and lions are the predatory animals of this district, and these have not proven to be a very great menace to the stock-men on the range.

ADDITIONAL STUDY:

A number of sample plots and protection plots will be fenced off and charted so that next summer I can get an accurate amount of data, regarding vegetative readiness, rate of growth, species, and feasibility as to the possibilities of getting better forage and reproduction.

Respectfully submitted by,

Deputy Supervisor of Forests,
Southern Navajo Reservation.

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