

Ept 10/1

Report written by Nov-24,
Tan Edston R-3 in 1968
for SCS.

* TRANSECT DATA

BERNALILLO WATERSHED

The effectiveness of land treatment measures in general has been good. The watershed shows improvement in vegetation and most of the structural storage capacity still exists.

Surface runoff reduction from contour chiseling and pitting is now obtained only indirectly by the resultant increase in grass cover which is not strikingly evident. It is now difficult to observe where these treatments were made due to the erosive characteristics of the soil.

The lower gentle slope terraces have revegetated well especially with galleta and sand dropseed. They still provide storage although some has been lost due to accumulated sediment deposits. Rodent damage has been and continues to be a problem requiring yearly control of populations and structure maintenance.

The steep slope terraces provide considerable capacity for storage but here again as expected the total capacity has been reduced by soil deposition. Sidecast grama and chamise have been established in and on terrace slopes but could not be considered as effectively covering and stabilizing these structures.

Gully plugs continue to function with the basins supporting increased vegetative growth.

Protection from grazing has apparently benefited increased vegetative cover and litter accumulation considerably, as evidenced by fence line contrast.

RANGE STUDIES
Bernalillo Watershed

To evaluate the effect of land treatment measures on range vegetation, the U. S. Forest Service installed nine 100 ft. line transects on May 26, 1955. Locations for transects have been selected that best sample the area.

These transects comprise step #2 of Parker's Three Step Method. Permanent steel stakes designate the transect locations and readings are taken along a 100 ft. steel tape at one-foot intervals. Readings are recorded for what is viewed in a loop of 3/4" diameter. Successive observations are made on the exact area defined by the original 3/4" loop reading. In this way, changes observed for each loop reading can be interpreted to indicate trends. Possible recordings for each loop reading are:

1. Perennial plants - by species of any portion (basal root crown for grasses and forbs - horizontal crown intercept for shrubs) falls within the 3/4" loop.
2. Rock - if 50% or more of loop is covered by rock with diameters of over 3/4".
3. Litter - if effective litter covers 50% or more of the 3/4" loop.
4. Bare soil - if over 50% of the 3/4" loop is composed of bare soil and no perennial plants are within the loop circumference.

These nine permanently located transects were reread on May 15, 1961 by the Forest Service. The 1955 and 1961 data are presented here to be evaluated as an indication of the effectiveness of treatment measures. It is not suggested that final conclusions can be drawn. Continuing readings and correlation of these with forage production and rainfall data will be necessary to draw final conclusions.

Composition, of species, is divided into decreasers, increasers, and invaders. These are based upon an ecological breakdown. Decreasers are usually more palatable or desirable plants from the standpoint of live-stock use, while increasers are those plants that benefit by the heavy utilization of decreasers. Invaders are those plants that are always increasing with ecological set backs such as bared soil and over-grazing. Invaders are seldom desirable from the standpoint of palatability.

Composition
% of Total Hits on Perennial Plants

	<u>Decreasers</u>	<u>Increases</u>	<u>Invaders</u>
1955	19%	33%	42%
1961	31%	56%	13%

Note that a favorable trend is indicated, especially the reduction of invaders from 42% to 13%; in most cases invaders do not give the degree of soil protection that is given by the other two categories.

Species Intercepted by 3/4" Loop

(+, -, 0) indicates an increase, decrease or no change in frequency in 1961 compared to 1955

1955	Decreasers	Black grama, Galleta
1955	Increases	Blue grama, Sand dropseed
1955	Invaders	Ring muhly
1961	Decreasers	+ Hairy grama, 0 Black grama, + Sideoats grama, - Galleta
1961	Increases	- Blue grama, + Sand dropseed
1961	Invaders	- Ring muhly

The increase in sideoats grama and sand dropseed could be partially due to reseeding these species.

Vigor

	<u>1955</u>		<u>1961</u>	
	<u>Seed</u>	<u>Stalk</u>	<u>Leaf</u>	<u>Leaf</u>
Sand dropseed	9"	2"	15"	3"
Blue grama	8"	2"	9"	2"

The increase in vigor is so slight that it would be difficult to conjecture on the influence of any other factor than precipitation.

Summary Hits
Average Per 100' Transect

	<u>1955</u>	<u>1961</u>
Hits - All Plants	9	10
Rock	5	9
Litter	9	19
Bare soil	77	62

From the Summary of Hits it can be seen, that for hits on plants, there has been no significant increase. It would be difficult to explain the increased presence of rock. Possibly the recently disturbed soil in 1955 was washed away exposing a greater cover of rock. The cover of litter has more than doubled and this is definitely an indication of an upward trend in hydrologic conditions. As a result of these increases, bare soil has decreased but still comprises about 2/3 of the total complex. Combining bare soil and rock gives 71% of the total complex to contribute to rapid runoff.

Local observers indicate that black grama is much more apparent now than in 1955; transect information does not agree. They say that fourwing saltbush, which was introduced into this area by plantings, has become well established and continues to provide excellent soil protection. Also, the indigenous Apache-plume is impressive in its natural propagation, growth, and soil protection.

The above information suggests a slight upward trend in both range and hydrologic conditions. No doubt, protection from grazing and the application of land treatment measures has had an effect. Fence line contrasts and observed vegetative growth associated with treatment measures, indicates a beneficial effect. A definite trend and contributing factors still remain to be determined.

Species List of Plants Referred To

Hairy grama
Black grama
Blue grama
Sideoats grama
Galleta
Ring muhly
Apache-plume
Fourwing saltbush

Bouteloua hirsuta
B. eriopoda
B. gracilis
B. curtipendula
Hilaria jamesii
Huhlenbergia torreyi
Fallugia paradoxa
Atriplex canescens

Please note:

The attached precipitation data includes much extrapolated data. Only two recording rain gages have been used to arrive at this compilation. Further processing of data and alternate methods of extrapolation may result in summaries at a later date that do not agree with that presented here.

It is felt that the average of these two gages gives a comparatively good average for the watershed. Also, the close proximity of the U. S. Weather Bureau Station at the Town of Bernalillo adds confidence to the accuracy of figures obtained by correlation with this Weather Bureau data. At this time, this is the best monthly precipitation information available for the Bernalillo Watershed.

PRECIPITATION - BERNALILLO WATERSHED
Monthly Summary

Average value listed for two recording rain gauges for years 54-60

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1954	.62	.06	.55	.01	1.06	.47	1.78	.25	1.01	.50	.14	.40	6.85
1955	.40	.30	.00	.23	1.35	.50	4.11	2.45	.09	.02	.12	.41	9.96
1956	.68	.46	.00	.00	.49	.56	1.18	1.00	.00	.68	.00	.00	5.05
1957	.90	.70	1.24	.51	.72	.21	1.96	1.29	.34	3.11	1.20	.27	12.45
1958	.62	.02	1.34	.28	.32	.12	.00	.44	1.24	.98	.65	2.20	8.21
1959	.01	.01	.94	1.21	.39	.84	.45	4.54	.00	2.66	.04	1.95	13.05
1960	.78	.74	1.05	.02	1.10	1.62	1.46	2.30	.52	6.12	.29	1.10	17.10
Average	.57	.33	.73	.32	.78	.62	1.56	1.75	.46	2.01	.35	.90	10.38

* Extrapolated data - known precipitation on watershed correlated with U. S. Weather Bureau Station data for Town of Bernalillo

ANNUAL PRECIPITATION

Bernalillo Watershed

1954 - 1960

% Growing Season Ppt. May - Sept

% Oct - April

85%

64%

36%

26%

45%

41%

1955

1956

1957

1958

1959

1960

Years

7364 = 52% Growing season and