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9 [13]l photos, tables.

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Flook, D.R. Fr

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Establishment and Analyses of Permanent Range Transects - Yaha Tinda Ranch, July 16 - 19, 1958.

Introduction

In order to trace any changes in the condition of the range on the Yaha Tinda Ranch, three clusters of "Parker Three-Step" transects were established and analysed July 16 to 19, 1958. The analyses were made by the writer. Mr. George Francis, student assistant, helped in setting out the transects, counting pellet groups, and recording the analyses. The work was done in response to a request by the Park Superintendent of Banff National Park.

This work provides us with information on the relative abundance of the various forage species present on the range at the time the transects were established. The greatest value will be obtained from the transects by re-analysing them at intervals of up to five years to detect changes in the density of the plant cover and the species composition. That information will indicate the effects of grazing intensity on the range during the interim period.

Procedure

The location of each cluster of transects was selected so as to represent a type of vegetation and a type of grazing use typical of a large portion of the ranch.

The centre of each cluster was marked by a cairn of rocks. The transects were each one hundred feet long and radiated north, south, east and west each starting about five feet from the centre cairn. They were laid out by the use of a hand

compass. Two angle iron stakes one inch by one inch by eighteen inches, were driven into the ground to a depth of one foot to mark each transect. A few rocks were placed against each stake to reduce the chances of horses stumbling it. Thw first stake marked the zero end of the transect and was located five feet north, east, south, or west of the centre cairn. The second stake was located about one hundred feet farther north, south, east or west of the first stake. A small hole was drilled through the zero point on the tape. The zero end of the tape was then inserted through a hack saw cut in the angle of the stake about one inch below the top. The tape was held fast in the stake by a pin dropped through the hole. A door-spring was fastened to the hundred foot end of the tape by means of a snap and to the opposite end of the spring was welded a narrow strip of steel which had several holes drilled in it. It was inserted through a hack saw cut in the angle iron stake farthest from the cairn to a point where there was sufficient tension on the door spring to hold the tape straight. A pin was then dropped through an appropriate hole in the narrow steel strip so as to hold it in place through the notch in the angle iron stake. The door-spring and accessories are demonstrated in figure 1.

A five eighths inch metal loop was dropped vertically alongside the tape at each foot interval notch. It was then recorded what plant species if any, had a root crown included within the loop, or if the loop was filled with bare soil, erosion, pavement, rock, litter, or moss. The use of the loop is demonstrated in figure 2.

Photographs were also taken in order to provide a permanent record of range conditions. A general and an oblique photo were taken looking south at the north end of each north transect and looking north at the south end of each south transect.

Because of the significance of the shrubby cinquefoil (Potentilla fruiticosa) as a range indicator, supplementary information on its abundance and height was collected by tallying all plants of that species and their heights on the 100 ft. strip within five feet of either side of each transect.

Counts of faecal groups of elk and horses were made on the same strips. It was attempted to count only groups deposited between autumn, 1957 and the time of the count.

Location of Transects

The first cluster of transects established, hereafter referred to as cluster one, was located by following the oil road three tenths of a mile west of the Scalp Creek bridge, and then travelling one tenth of a mile south over the range to the centre cairn.

Cluster two was located by travelling on the main ranch road sever tenths of a mile west of Bighorn Creek and then a short distance north of the road. The centre cairn is readily visible from the road.

Cluster three was located by travelling one and four tenths miles east of Bighorn Creek on the main ranch road and then straight up the hill immediately north of the road. The centre cairn is near the crest of the hill. There are

aspen clumps nearby east, north, and west of that cluster.

Results

The species composition and density of the plant cover as measured on the transects by the loop method are presented in tables 1, 2, and 3.

The oblique and general photos taken from the north and south ends of each cluster are included in plates 3, 4, and 5.

The numbers of shrubby cinquefoil plants by height classes on each strip one hundred feet by ten feet in each cluster are tabulated in table 4.

The numbers of faecal groups of elk and horses counted on each strip one hundred feet by ten feet in each cluster are tabulated in table 5.

No interpretation of results will be presented in this report. The results will become much more meaningfull when the analyses are repeated. That should be done by 1963.

In order to utilize the results of range studies in grazing management, records should be kept of the numbers of horses grazed on the ranch during each month of the year and their distribution as to areas within the ranch.

14/4/12
For virtual abundance of Festuca scabrella plants on transects in 1962, I believe that species was present in 1958 but misidentified because they did not flower that year. D.F.

Edmonton, Alta.
August 10, 1960.

D.R. Flook

Donald R. Flook,
Wildlife Biologist.

Table 1. Species Composition* by Transect, Cluster 2
Yaha Tinda Ranch

Class or Species	North Transect	East Transect	South Transect	West Transect
Agropyron trachycaulum & A. subsecundum	4	1	4	5
Bromus pumpellianus	0	1	0	-
Carex sp.	22	17	19	12
Helictotrichon hookeri	1	1	3	2
Koeleria cristata	20	29	27	26
Poa sp.	1	-	1	1
Total grasses & grass-like plants	48	49	54	46
Agoseris scorzoneraefolia	1			
Anemone multifida		1		
Antennaria sp.	4	5	4	3
Artemisia frigida	1	2	1	
Campanula rotundifolia	2		2	
Delphinium scopulorum			1	
Geum triflorum	1	2		2
Hieracium sp.	2		2	
Matricaria matricarioides	2		1	2
Oxytropis macounii	2		1	1
Total forbs	15	10	12	8
Plant density index	63	59	66	54
Moss	11		0	
Litter	26	37	32	41
Ground cover index	100	96	98	95
Bare soil		3	2	5
Rock		1		
Erosion pavement				

* Percent

Table 2. Species Composition* by Transect, Cluster 1. Yaha Tinda Ranch

Class or Species	North Transect	East Transect	South Transect	West Transect
Agropyron trachycaulum & A. subsecundum	3	1	2	4
Bromus pumpellianus	1			
Carex sp.	12	8	12	12
Helictotrichon hookeri	1	4	6	1
Koeleria cristata	20	22	20	13
Poa sp.	-	-	1	1
Total grasses & grass-like plants	37	35	41	31
Agoseris scorzoneraefolia	-	1	1	
Anemone multifida	1		1	
Antennaria sp.	6	1	1	7
Artemisia frigida	-	-	1	3
Campanula rotundifolia		1		
Erigeron caespitosus	5	1	4	
Galium boreale	-	1	3	
Geum triflorum	3	3	1	1
Matricaria matricarioides	-	3	-	5
Oxytropis macounii	-	1	1	3
Solidago missouriensis	-	1	-	1
Zygadenus elegans	-	-	-	2
Total forbs	15	13	13	22
Potentilla fruticosa	1		1	
Arctostaphylos uva ursi	-	-	-	2
Plant Density Index	53	48	55	55
Moss	11	13	10	4
Litter	33	35	29	39
Ground Cover Index	97	96	94	98
Bare Soil	2	4	6	2
Rock	1	-	-	-
Erosion Pavement	-	-	-	-

* Percent

Table 3. Species Composition* by Transect, Cluster 3. Yaha Tinda Ranch

Class or Species	North Transect	East Transect	South Transect	West Transect
Agropyron trachycaulum & A. subsecundum	1		1	1
Carex sp.	23	23	25	25
Helictotrichon hookeri	1	2	1	1
Koeleria cristata	15	16	18	19
Total grasses & grass-like plants	40	41	45	46
Achillea lanulosa		1		
Agoseris scorzoneraefolia		1	1	
Anemone multifida	1	4	6	2
Antennaria sp.	5	4	4	2
Astragalus sp.			1	1
Campanula rotundifolia			1	1
Geum triflorum	2	1	1	
Matricaria matricarioides	1	2		
Oxytropis macounii	1	3	2	1
Solidago missouriensis	1	1	1	3
Total forbs	11	17	17	10
Potentilla fruiticosa	1	1	1	2
Plant Density Index	52	59	63	58
Moss Litter	46	32	35	27
Ground Cover Index		91	98	
Bare Soil	2	9	2	15
Rock				
Erosion pavement				

* Percent

Table 4. Numbers of Shrubby Cinquefoil* Plants on 100 sq. ft. strips by Height Class

Height Class inches	Cluster 1				Cluster 2				Cluster 3				Totals		
	North strip	East strip	South strip	West strip	North strip	East strip	South strip	West strip	North strip	East strip	South strip	West strip	Cluster 1	Cluster 2	Cluster 3
2	2	3	1				1	1			1	2	6	2	3
3	5	4	4	5	1	3	2	3		1	1	6	18	9	8
4	2	7	17	6	12	5	4	9	3	3	4	3	32	30	13
5	5	6	12	8	18	17	5	14	8	3	1	7	31	54	19
6	3	14	12	11	13	10	13	18	8	4	2	6	40	54	20
7	2	14	5	7	12	12	10	16	14	3	4	11	28	50	32
8	2	5	17	6	9	13	8	11	16	4	1	8	30	41	29
9	2	15	15	8	10	7	9	8	12	3	8	13	40	34	36
10	2	9	9	5	4	6	10	5	11	3	8	20	25	25	42
11		8	3	4	4		3	5	17	7	8	7	15	12	39
12	2	6	10	3	2	1		5	16	7	9	10	21	8	42
13	3	4	8	3				1	19	9	9	16	18	1	53
14	2	7	2			1			8	4	6	9	11	1	27
15	1	3	4	1					17	2	8	9	9		36
16		2	2	4					7	8	10	7	8		32
17	1		1						6	8	7	4	2		25
18	3	4	1	1					5	1	7	3	9		16
19		1		1					4	2	3	8	2		17
20				1					6	2	2	3	1		13
21									1	4	2	3			10
22				1					1	3	3	3	1		10
23		1		1					1	1			2		2
24										1	2				3
25				1								1	1		1
26										1					1
27										1					1
28				1									1		
36										1					1
Total	37	113	123	78	85	75	65	96	180	86	106	159	351	321	531

* Potentilla fruiticosa

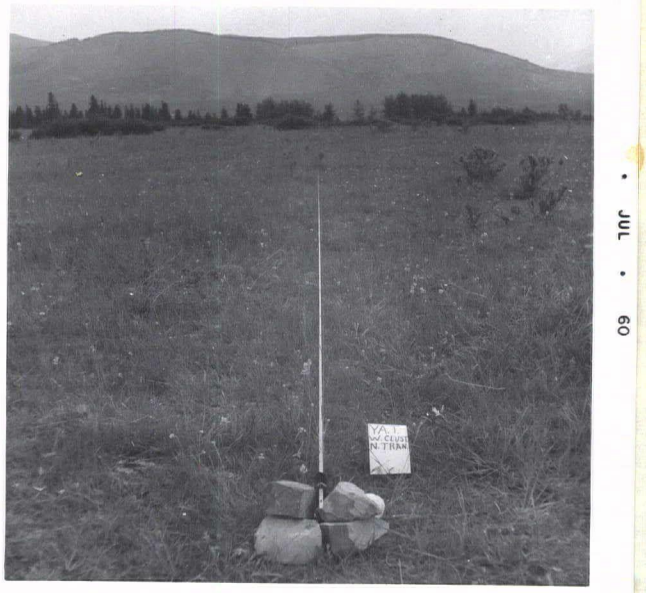
Table 5. Faecal Group Counts on 100 sq. ft. strips

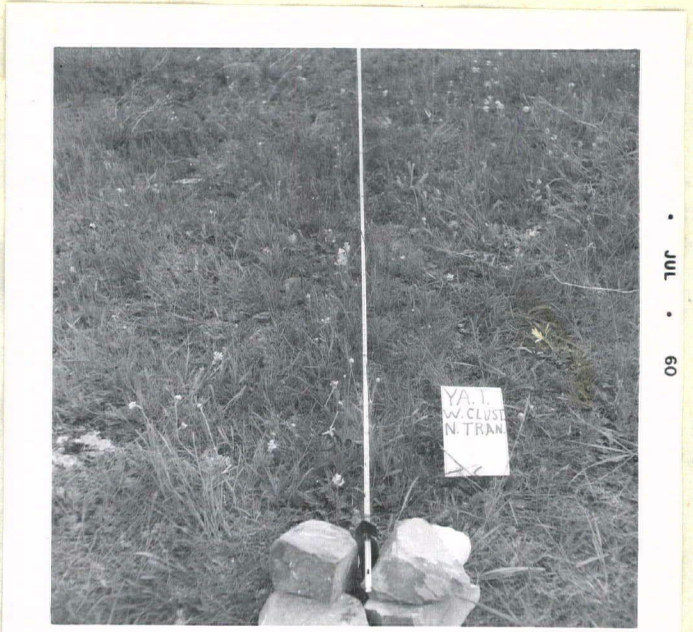
	North Transect		East Transect		South Transect		West Transect		Total	
	Horses	Elk	Horses	Elk	Horses	Elk	Horses	Elk	Horses	Elk
Cluster 1	6	18	3	14	-	22	8	14	17	68
Cluster 2	3	38	1	37	6	32	5	43	15	150
Cluster 3	5	25	1	25	4	17	3	26	13	93

Fig. 1. Use of door spring to maintain tension on tape.

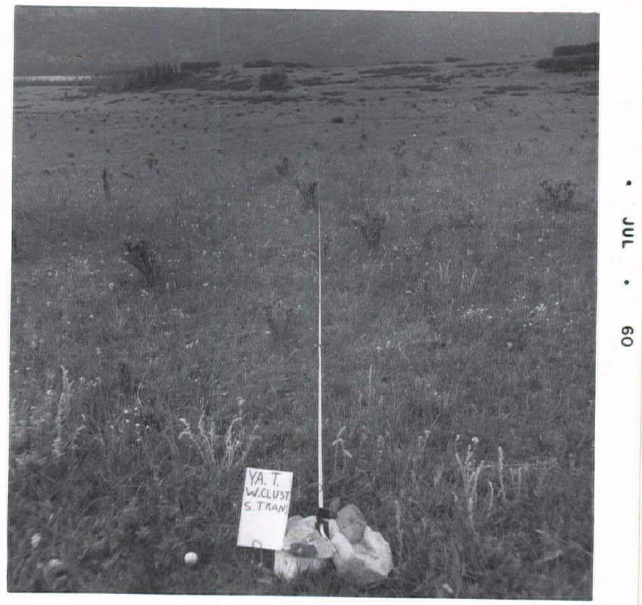
Fig. 2. Use of five-eighths-inch loop in analysing plant cover.

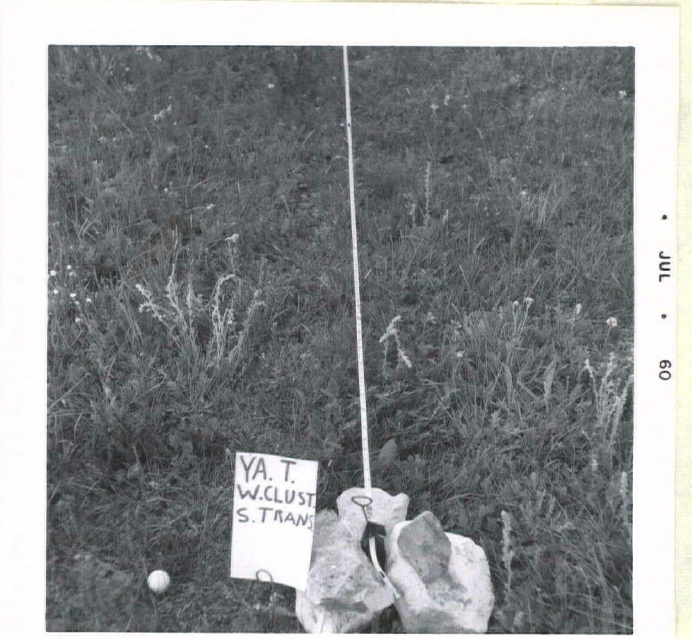
Plate 1. Photos of range cluster 1.





Viewed ~~from~~ to the north

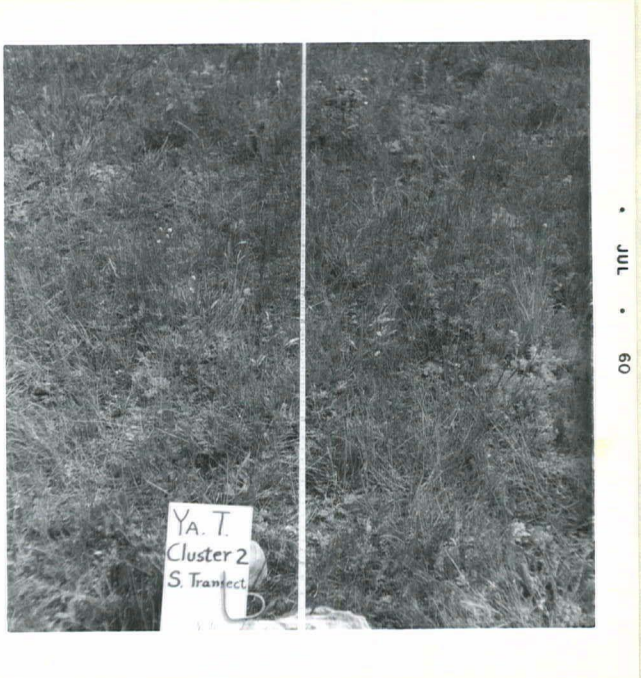




Viewed ~~from~~ to the south

Plate 2. Photos of range cluster 2.

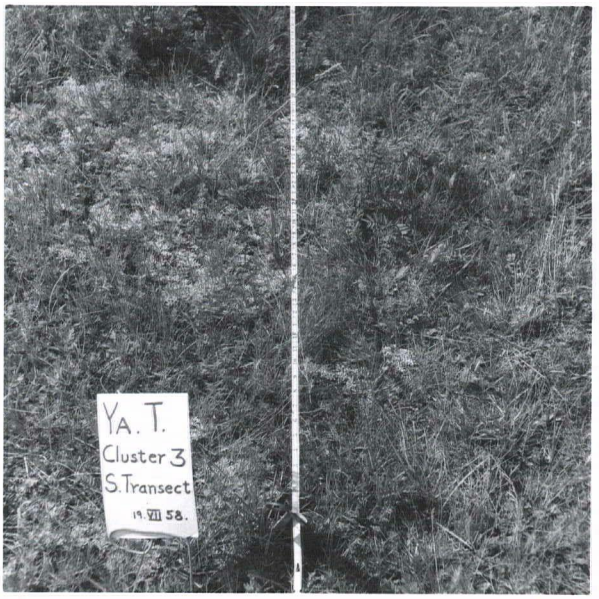
Viewed ~~from~~ north
to the



Viewed ~~from~~ south
to the

Plate 3. Photos of range cluster 3

Viewed ~~from~~ to the north



Viewed ~~from~~ to the south