RR
Pine Ranges
Burgess Spring

August 28, 1937
J. R. Bentley

Progress Report for Period
August 9 - 22, 1937
Burgess Spring Experimental Range

Climate

Hot summer temperatures prevailed during the first of this period. The maximum air temperature reached the highest of the season, 91.3°, on August 12. The temperature dropped during the remainder of the period, the maximum being 77.5° on August 22. Minimum temperature during the period was 47.1° on August 15 and 16.

Soil temperatures followed the same trend as air temperatures but did not reach the year's maximum, recorded in July. The maximum during the period was 143.0°, the minimum was 40.8°.

Humidity remained low during the period. The maximum was 84 percent but it remained below 50 five nights. The minimum was 10 percent but reached 11 on three days and was above 20 on only one day.

Wind movement was rather uniform and below that of last year. A year ago the fall winds started during this period. This year the maximum movement was 48.5, the minimum was 26.8 and average 36.0 miles per day.

Evaporation remained fairly high and varied little during the period. The maximum was 11.33 gallons per day and the minimum 7.67. The average was 9.05.

No rain fell and the vegetation and soil continued to dry.

Phenology

All perennial vegetation cast seed during this period, if not already shattered. Wyethia leaves are turning brown and crisp. Chrysothamnus is beginning to flower, most of the buds starting to open during the last week.

The small percent of fescue plants that produced seed stalks produced very little seed. Many of the spikelets did not pass the flowering stage before drying, the anthers shriveling in the florets. Insects are present in part of the heads.

Cattle

Weights - The recorded gains for the cattle during the last 12 days were surprisingly high. The yearling steers made the highest, averaging 3.33 pounds per day; the average of all the animals was 2.5. The weights obtained the previous weighing may have been slightly low, but this large weight increase after midseason shows a surprising value for the forage on cut-over pine, even after it starts to dry. The animals do not appear to have the "finish" that they had two weeks ago, but are apparently "hardening" under a rougher coat.

The cattle were brought in on foot after watering the previous evening. The morning was much cooler than at the preceding weighing and apparently the cattle were less gaunt. Heifer No. 4, that was sick two weeks before, seemed to be in good shape at this weighing.

Cattle Weights and Gains, 1937

Class	Number	Weight June 14	Weight August 23	Gain Total	Gain Last 12 day Period
Yearling	1	316	488	172	33
heifers	2	415	597	182	21
	3	462	645	183	21
	4	313	451	138	34
Average		377	545	168	27
Av. per day				2.40	2.25
Yearling	5	511	713	202	48
steers	6	515	764	249	54
	7	475	692	217	43
	8	506	686	180	11
Average		502	714	212	40
Av. per day				3.03	3.33
2-year	9	681	934	253	26
steers	10	788	945	157	18
	11	783	1060	277	38
	12	850	1082	232	18
Average		776	1005	229	25
Av. per day				3.27	2.08
3-year	13	618	808	190	26
cows	14	822	1016	194	40
	15	697	864	167	26
	16	610	806	196	28
Average		687	874	187	31
Av. per day				2.67	2.58
Total		9362	12551	3189	485
Av. per Animal		585	784	199	30
Av. per day				2.84	2.50

Choice of Species - Lupine continued to be the species of No. 1 rank, in the cattles' selection of food. It has been grazed over all of the pasture and a relatively small number of ungrazed plants remain. However, the cattle are still eating on plants that have been grazed previously.

Bromus marginatus ranked second because at one examination cattle were observed grazing on the slope above the corrals where this species abounds. The cattle chose a large number of plants but the bulk obtained was limited because most of the plants had been grazed previously. The cattle selected green B. marginatus and Sitanion hystrix growing among the dry B. tectorum. Some dry B. tectorum and all protected green plants were eaten.

Bitterbrush is being eaten as the cattle find unclipped portions of shrubs. The stock are not searching for this species. Most of the current growth is already taken.

Two species usually eaten in late season, Madia and Wyethia, are in the group of plants commonly selected. The stock appear to like Wyethia more than last year. Instead of only nipping off the ends of the leaves, the stock often stay with one plant until it is rather heavily grazed - - within 5 or 6 inches of the ground in extreme cases.

Species	Total No. of Choices	Percent of Diet Aug. 13	Aug. 14	Aug. 18	Aug. 19	Aug. 20	Plant Parts Grazed[1] L	S	I	F	A	M	D	R	Is
1. Lupinus calcaratus	969	T	85	88	38	85	x	x	.	x	.	.	.	.	x
2. Bromus marginatus	315	45	2	T	1	0	x	x	.	.	x	.	.	x	.
3. Festuca idahoensis	254	0	7	3	45	10	x	x	.	.	x	.	.	.	.
4. Sitanion hystrix	154	25	3	T	T	T	x	x	.	.	.	.	.	x	x
5. Bromus tectorum	89	10	0	0	0	0	x	.	.	.	.	.	.	.	.
6. Wyethia mollis	83	T	0	T	T	3	x	.	.	.	.	.	.	.	.
7. Purshia tridentata	72	0	T	4	10	T	x	x	.	.	.	.	.	.	.
8. Madia elegans	70	5	T	T	0	0	x	x	.	x	x	.	.	.	x
9. Stipa lemoni	66	5	T	0	0	0	x	x	.	.	x	.	.	x	x
10. Gayophytun sp.	44	3	T	T	0	T	x	x	.	x	x	.	x	.	.
11. Ceanothus prostratus	43	T	T	T	T	T	x	.	.	.	.	.	.	.	.
12. Balsamorhiza sagittata	22	0	T	T	T	T	x	.	.	.	.	.	.	.	.
13. Elymus sp.	20	3	0	0	0	0	x	x	.	.	.	.	x	.	.
14. Eriogonum nudum	12	T	T	0	0	0	x	x	x	x	.	.	.	.	.
15. Stipa elmeri	11	T	T	T	0	T	x	x	.	.	x	.	.	x	x
16. Arctostaphylos patula	4	T	0	0	T	0	x	x	.	.	.	.	.	.	.
17. Eriophylum lanatum	4	0	T	0	0	0	x	x	.	x	.	.	.	.	.
18. Amelanchier alnifolia	3	0	T	0	0	0	x	.	.	.	.	.	.	.	.
19. Monardella sp.	3	0	0	T	0	0	x	x	.	.	x	.	.	.	.
20. Carex sp.	3	0	0	T	0	T	x	.	.	.	.	.	.	.	.
21. Stipa occidentalis	3	0	0	0	T	T	x	x	.	.	.	.	.	x	.
22. Eriognum spergulinum	3	0	0	0	0	T	x	.	.	.	.	.	.	.	x
23. Polygonum	2	0	T	0	0	0	x	x	.	.	x	.	.	.	.
24. Phacelia heterophylla	1	T	0	0	0	0	x	x	x	x	.	.	.	.	.
25. Crepis acuminata	1	0	T	0	0	0	x	x	.	.	x	.	.	.	.

1/ L = leaves
S = stems
I = inflorescence
F = flower
A = in fruit
M = fruit in milk
D = " " dough
R = fruit ripe
Is = inflorescence shattered

Species	Total No. of Choices	Percent of Diet					Plant parts grazed								
		Aug. 13	Aug. 14	Aug. 18	Aug. 19	Aug. 20	T	S	I	F	A	M	D	R	Is
26. Achillea millifolium	1	0	T	0	,0	0	.	.	.	x	.	.	.	.	.
27. Allocarya sp.	1	0	0	T	0	0	x	x	.	.	x	.	.	.	.
28. Mentzelia sp.	1	0	0	T	0	0	x	x	.	.	x	.	.	.	.
29. Symphoricarpos	1	T	0	0	0	0	x	x	.	.	.	.	.	.	.
Totals	2255	606	369	535	117	628									

Salt Consumption - Average consumption during the two-week period dropped appreciably. Ground salt was discontinued and block salt used after August 11. Stock did not come to salt from the morning of August 12 until August 15. This made the average use during the first week rather low, but the use for the second week was slightly above the average for the preceding month. The use of block salt might not have been the factor responsible for the change in consumption and will be continued for another period. Losses from salt being scattered by the animals have been eliminated.

Salt consumption August 9 - 22, 1937

Date	Pounds Used		Remarks
	Total	Per head (16)	
August 9	.80	.05	Cattle and deer
10	.70	.04	Cattle and deer
11	.25	.02	Cattle and deer
12	.05	0	Deer
13	.05	0	Deer
14	0	0	Deer
15	.15	.01	Cattle and deer
16	.95	.06	Cattle
17	.60	.04	Cattle and deer
18	.95	.06	Cattle and deer
19	.10	0	Deer
20	0	0	
21	1.40	.09	Cattle and deer
22	.10	.01	Cattle and deer
Average per day	.44	.03	

Water consumption - Water consumption increased during this period to an average of 8.36 gallons per head per day; the small amount used by deer included in the average. Daily use was very uniform, varying between 6.65 and 10.44 gallons per day.

Water Consumption August 9 - 22, 1937

Date	Gallons Used 1/ Total	Av. per head (16)	Remarks
August 9	134.07	8.38	Cattle and deer
10	123.43	7.71	"
11	106.37	6.65	"
12	166.97	10.44	"
13	128.50	8.03	"
14	2/		"
15.	118.37	7.40	"
16	134.03	8.40	"
17	127.00	7.90	"
18	134.03	8.40	"
19	152.50	9.50	"
20	144.67	9.04	"
21	142.04	8.90	"
22	128.33	8.02	"
Average per day	133.89	8.36	

1/ Evaporation subtracted

2/ Record lost

Time of Salting and Watering - No time records have been lost since July 20. Block salt works very well in the recording salt boxes. The increased "licking" required for a cow to obtain all the salt desired makes a very definite record on the Bristol.

Cattle watered every day. All waterings were in the P. M. except the day on which they were weighed. They watered once at 12:30 P. M. All other times were between 3:30 and 8:00 but mainly between 4:30 and 6:00. Stock now come into water even if crew is near the corrals.

The stock salted on seven days, omitting seven. They missed three consecutive days at one time. All of the stock were not in on some of the days that they took salt.

On three days stock salted within one hour before watering; however, on two of these days part of the herd salted in early morning.

On two other days they salted two hours before watering, but on one of these part of the herd salted earlier in the day.

On other two days they salted during moonlight nights. Night salting hours were 10 to 11 P.M., 10 to 12:30, and 1:30 to 5:30 A.M.

Pine Seedling

Total mortality has reached over four fifths of total germination, although it increased only 6 percent this last period. Heat accounted for most of the recent mortality but rodents killed a few.

Total number of seedlings killed by stock took a sharp rise, but the percent of total mortality attributed to cattle is about the same. While still a small factor in survival of pine seedlings the percent of total mortality caused by cattle is 2½ times that at the end of last season.

Record of Pine Seedlings

Examination No.	1	2	3	4	5	6
Date	June 1-11	June 21-21	July 6-8	July 19-22	Aug. 2-3	Aug. 16-17
New Germination	1607	353	156	49	5#	0X
Total Germination	1607	1960	2116	2165	2170	2170
New Mortality	311	612	294	278	190	129
Total Mortality	311	923	1217	1495	1685	1814
% Mortality to Date	19.4	47.1	57.5	69.1	77.6	83.6
Total Alive	1296	1037	899	670	485	356
New Mortality from Cattle	0	18	11	7	0	9
Total Mortality (to date)	0	18	29	36	36	45
% of Total Mortality (to date)	0	2.0	2.4	2.4	2.1	2.5
Trampled (total number)	0	14	23	30	30	39
Grazed (total number)	0	4	6	6	6	6

Based on 367 quadrats containing live seedlings at Ex. 4

X Based on 286 quadrats containing live seedlings at Ex. 5

Wildlife

Tentative check lists prepared by J. T. Wright show 28 species of birds and 15 mammals collected by him during his short stay here. A total of 130 specimens were collected. A future check of identification and locality of collection will show how many of these were found on the Burgess Spring Experimental Range.

In addition to miscellaneous collection, a series of traps were set in the south half of Pasture I, B. S. E. R., on four nights, August 16 - 20. A total of 717 mouse trap-nights yielded 64 Peromyscus, 3 Perognanthus, 2 Microtus, and 1 Eutamias. If continued, the study would have given some valuable population and habitat information for cut-over East side pine.

Some intensive trapping near Eby Lake yielded a little information on mouse habit, the animals being collected only in shrubby type of cover-sage and willows. None were caught in comparatively clean forest floor. Only Peromyscus were caught away from the willows.

Evidently, Mr. Wright has found a wood rat new to published literature. The following quotations are from his report of the limited work done here.

"In the willow clumps along the present shore line of Eby Lake (August shore line) are a number of wood rat nests. Trapping here resulted in only one specimen. This specimen is probably Neotoma lepida nevadensis Taylor. A similar specimen was taken August 12/13, No. 723. A specimen taken the same date is apparently not the same wood rat. In this connection the following is noted. On July 25, I went into the forest to the west of the headquarters buildings and found in the open area in a juniper a wood rat nest - similar to the one pictured in

Vertebrate Natural History of Lassen Peak Region (University of California Pub. in Zool., Vol. 35) on page 519. After much work the occupant was routed out and shot - it was a round-tailed wood rat. Six specimens of this wood rat were taken, all but one by tearing up the nest and routing out the rat:

Date	No.	Sex	L.	T.	Hf	Ear (from notch)	Wt.	Location of nest
July 25	627		399	196	37	30	350	In juniper
27	634		371	174	38	30	237	"
Aug. 3	664		398	199	39	32		"
11	717		412	194	42	32	398	"
12	719		329	110	40	30	343	"
13	724		394	188	41	32	348	"

"No. 719 - a battered old veteran - gone is his tail - ears chewed and frozen.

"The nests of these rats conformed as to location with the description of the nests given in the above cited publication for Neotoma cinerea occidentalis. No bushy-tailed wood rats were taken although a special search was made for them. The stomach contents of the specimens above enumerated had a strong odor of juniper trees and were of the complex type. It is regretted that I was not afforded an opportunity to collect a good series of this wood rat and make a study of the nests and food habits."

VISITORS

During the first of the period we were visited and inspected by members of the research organization in Washington and by our Director. In addition two members of the Berkeley Range Research force were at Blacks Mountain.

On August 10, Mr. Forsling, Dr. Larrimer, and Mr. Kotok and son visited the Blacks Mountain and Burgess Spring areas in the afternoon after a morning spent in the office discussing programs of work carried on a this branch.

Dr. Haig made a short visit to the Range on August 12.

Mr. Talbot was with us from August 10 to 12. Helen Adams and friend visited the headquarters for a short time the afternoon of August 12.

PERSONNEL

Three members of the Range force left to attend school this winter.

Mr. Gansberg and Jim Jordan returned to Berkeley to continue undergraduate forestry work at the University of California. George Turner went to Berkeley preparatory to returning to Syracuse where he is doing graduate work at the New York State College of Forestry. We appreciate the help these men gave us during the summer and wish them good luck.

J. T. Wright, biologist, left August 25 for the San Dimas Experimental Forest. We enjoyed working with him and are sorry that it was necessary to make this transfer before his job could be completed here.