Technical Report No. 304

AN OVERVIEW OF BRIDGER SITE BIOMASS DATA: 1969-1973

T. Weaver and B. Haglund

Biology Department

Montana State University

Bozeman, Montana

GRASSLAND BIOME

U.S. International Biological Program

December 1976

TABLE OF CONTENTS

ABSTRACT

A mountain meadow ecosystem (*Festuca idahoensis-Agropyron caninum*) was studied in the years 1969 through 1973. This report describes sampling methods, periodicity of sampling, and results obtained on biomasses of plants (above and below ground), insects, birds, and mammals.

INTRODUCTION

The Bridger Site lies in a high mountain meadow 22 km northeast of Bozeman, Montana at the Bangtail U.S. Forest Service Ranger Station 2380 m altitude, 46°47' N latitude, and 110°44' W longitude. Its vegetation is of the *Festuca idahoensis-Agropyron caninum* type (Mueggler and Handl 1973); surrounding forests are dominated by *Abies lasiocarpa* or seral *Pinus contorta*. Published records of the vegetation, soils, and climate of the Bangtail Ridge are found in Weaver (1974), Buchanan (1972), and US Department of Commerce (1969-1972). Previous site reports include Collins (1970), Collins (1971), and Weaver and Collins (1972). Mueggler (1971, 1972) describes the climate and vegetation of similar meadows in the Gravelly Range, Montana.

The major objectives of Bridger Site studies have been: (i) to describe the structure and function of a near-climax mountain meadow which has had essentially no domestic grazing since 1930, and (ii) to contrast its structure and function with those of similar sites which have received regular sheep-cattle grazing and similar sites which receive heavy snow packs due to long-standing natural barriers (trees or land forms) or to snowfences in place from September through June since 1968.

This report summarizes the biomass data collected at the Bridger Site from 1969-1973. It consists of five sections describing the aboveground plant, belowground plant, arthropod (aboveground and belowground), avian, and mammalian biomasses and seasonal changes in these biomasses. No attempt has been made to measure microbe biomasses: algal, bacterial, fungal, or protozoan. Bissett and Parkinson's (unpublished, Appendix Table 22) appear relevant. Nematode numbers and biomasses measured in

1972-1973 were significant (Appendix Table 23). Repitles have not been seen at the site and are not expected at these altitudes. Abiotic data and data from process studies (especially litter decomposition, soil respiration, and phenology) will be reported elsewhere.

ABOVEGROUND PLANT BIOMASS

Treatments sampled included an area protected from grazing since about 1930 (two replications), an adjacent area subjected to relatively light annual sheep and/or cattle grazing except in the study years (two replications), an area receiving an artificial snowpack of 12 dm (approximately two times normal, one replication), and an area receiving an artificial snowpack of 25 dm (four times normal, one replication). The snowfences were dismantled in the summer season to avoid shelter effects (Marshall 1967). The ungrazed area and snow treatments were sampled annually from 1969 to 1973. The grazed treatments were sampled in 1970 and 1972.

Aboveground plant biomass was generally measured by the methods recommended by Swift and French (1972). In 1970 through 1973 ten 1 × 0.5 m quadrats from each treatment sampled were clipped at each sampling date. Sampling was from randomized blocks. Sorting into species categories was done in the field, and on returning from the field samples were dried at 60°C and weighed. Minimal sorting was done in 1973 due to lack of funds. In 1972 subsamples of major plants were analyzed for total carbohydrates, nitrogen, phosphorus, ash, cell wall constituents, and lignin. In 1969 each treatment was sampled with ten "randomly placed" 0.2 × 0.5 m quadrats.

The results of the clipping studies are summarized in Appendix Tables 1-21.

Average production in the ungrazed-1 treatment was 233 g/m^2/year (Table 1). The value presented is a sum of the maximum standing crops of each species separated: it is probably a low estimate since many species were pooled in the miscellaneous grass and forb categories and it is considerably higher than an estimate based on maximum standing crop (see Mueggler 1972). Production ranged from 153 g/m^2 in 1970 when soil water was largely exhausted by 10 August to 342 g/m^2 in 1972 when soil water stresses at 25 cm never exceeded 7 bars.

The effect of a light grazing history had essentially no effect on range production (Table 2). Total production in 1972, a wet year, was 366 g/m^2 (233 g of grass and 134 g of forbs) on the ungrazed-2 site and 369 g/m^2 (242 g of grass and 125 g of forbs) on the adjacent grazed-1 site. In the drier year 1970 the ungrazed-2 site and the grazed-1 sites produced 200 and 149 g/m^2, respectively; I attribute the difference to the lesser water storage capacity (shallower soil) found on the grazed site.

Production is generally reduced on heavy snowpack sites (Tables 3 and 4) because they melt out much later than the average site, dry up shortly after the average site, and therefore have a relatively short growing season. Water relations on either site are similar because normal winter and spring precipitation are sufficient to bring the whole soil to field capacity so additional snow drains through the profile when it melts. A comparison of the data from the ungrazed-1 and the 25 dm sites illustrates this nicely. In the "normal" years of 1969, 1970, 1971, and 1973 production was lower on the snowy site than on the unmodified site; production before mid-August of 1972 was also low but August rains

Table 1. Production (species peaks - g/m^2) on the ungrazed-1 treatment, Bridger Site, 1969-1973.

Taxon	1969	1970	1971	1972	1973	Mean
Festuca idahoensis	50	38	70	115	43	
Agropyron subsecundum	50	32	41	71	--	
Miscellaneous grasses						
Miscellaneous grasses	21	25	22	22	--	
Koeleria cristata	15	2	--	19	--	
Danthonia intermedia	12	7	7	10	--	
Carex spp.	7	--	7	14	--	
Total	55	34	36	65	89[a/]	
Lupinus argenteus	31	21	35	31	27	
Early forbs						
Miscellaneous forbs	23	22	24	24	--	
Agoseris spp.	7	4	9	12	--	
Total	30	26	33	36		
Late forbs						
Cerastium arvense	16	3	6	13	--	
Erigeron speciosus	15	6	16	8	--	
Achillea millefolium	5	3	3	7	--	
Arenaria congesta	14	5	7	19	--	
Galium boreale	4	6	8	8	--	
Total	54	23	40	55	59[b/]	
Total	270	153	184	342	218	233

[a/] Total of grasses except *Festuca idahoensis*

[b/] Total of forbs except *Lupinus argenteus*

Table 2. A comparison of production (species peaks - g/m^2) on the ungrazed-2 and grazed-1 treatments: Bridger Site, 1970 and 1972.

Taxon	1970		1972	
	Ungrazed-2	Grazed-1	Ungrazed-2	Grazed-1
Festuca idahoensis	56.2	37.6	137.1	88.1
Agropyron subsecundum	25.5	15.2	51.2	67.7
Carex spp.	--	--	14.0	35.6
Danthonia intermedia	8.5	14.7	17.5	27.2
Koeleria cristata	4.1	1.8	13.0	11.6
Miscellaneous grasses	11.5	23.7	11.1	12.2
Total grasses	105.8	93.0	232.8	242.4
Lupinus argenteus	27.3	15.1	39.6	24.1
Arenaria congesta	6.8	3.5	21.3	20.0
Achillea millefolium	3.5	3.9	6.5	9.5
Agoseris spp.	1.8	0.7	9.0	0.8
Erigeron speciosus	5.8	1.1	4.8	2.6
Cerastium arvense	5.0	2.1	8.9	9.0
Galium boreale	6.5	6.2	6.8	2.9
Miscellaneous forbs	38.0	23.5	36.7	56.4
Total forbs	94.7	56.1	133.6	125.3
Total production	200.5	149.1	366.4	367.7

Table 3. A comparison of production (species peaks - g/m^2) on fescue meadows receiving normal (6 dm) snowpacks and experimental areas receiving 25 dm snowpacks. Treatment started in fall of 1968.

Taxon	Ungrazed-1									
	Normal snowpack (approx. 6 dm)					Heavy snow - 25 dm snowpack				
	1969	1970	1971	1972	1973	1969	1970	1971	1972	1973
Festuca idahoensis	50.0	37.6	47.1	115.5	44.1	34.6	16.7	13.8	32.9	5.0
Agropyron subsecundum	50.4	31.7	41.6	71.0	--	15.8	25.0	33.9	137.8	--
Carex spp.	7.0	--	6.9	13.6	--	11.0	--	1.4	2.9	--
Danthonia intermedia	12.3	6.8	7.4	9.7	--	5.6	5.9	2.3	1.9	--
Koeleria cristata	14.8	2.0	--	19.0	--	8.1	3.4	--	7.5	--
Miscellaneous grasses	18.0	24.8	21.8	21.5	79.1	9.2	15.2	32.3	11.4	34.5
Total grasses	152.5	102.9	124.8	250.3	123.2	84.3	66.2	83.7	194.4	39.5
Lupinus argenteus	31.5	20.6	34.8	31.3	37.9	42.8	28.5	32.0	32.3	19.7
Arenaria congesta	11.1	5.3	7.0	18.6	--	9.9	4.8	5.4	8.1	--
Achillea millefolium	5.4	2.9	2.5	7.4	--	12.2	8.6	5.4	23.7	--
Agoseris spp.	6.4	4.3	9.3	11.5	--	12.8	6.6	6.6	15.4	--
Erigeron speciosus	14.5	5.6	16.0	7.6	--	8.2	6.9	9.0	18.8	--
Cerastium arvense	15.9	3.0	5.6	13.5	--	5.6	1.1	0.9	2.7	--
Galium boreale	2.4	6.3	8.4	7.7	--	9.4	3.6	12.5	14.3	--
Miscellaneous forbs	23.4	21.7	24.3	23.8	46.8	20.4	43.1	16.7	70.9	77.1
Total forbs	110.6	69.7	107.9	121.4	84.7	121.3	103.2	88.5	186.2	96.8
Total production	263.1	172.6	232.7	371.7	207.9	206.0	169.4	172.2	380.6	136.3

Table 4. Production (species peaks - g/m^2) on an experimental area receiving 12 dm snowpacks (approximately two times normal pack). Treatment started in the fall of 1968. Compare with Table 3.

Taxon	1969	1970	1971	1972	1973
Festuca idahoensis	29.3	26.7	31.7	67.5	26.9
Agropyron subsecundum	6.0	14.7	19.0	47.1	--
Carex spp.	8.1	--	4.3	12.5	--
Danthonia intermedia	14.0	8.6	5.7	11.8	--
Koeleria cristata	7.4	7.2	--	8.4	--
Miscellaneous grasses	3.2	16.7	6.2	10.4	42.0
Total grasses	68.0	73.9	66.9	157.7	68.9
Lupinus argenteus	22.3	47.1	31.7	27.0	16.7
Arenaria congesta	6.4	8.6	5.6	14.7	--
Achillea millefolium	11.3	10.6	9.9	12.8	--
Agoseris spp.	6.8	5.3	11.5	24.6	--
Erigeron speciosus	12.4	5.2	4.6	8.4	--
Cerastium arvense	6.8	3.1	1.2	7.3	--
Galium boreale	5.6	5.2	13.8	16.3	--
Miscellaneous forbs	19.9	36.6	19.5	50.6	92.0
Total forbs	91.5	121.7	97.8	161.7	118.7
Total production	159.5	195.6	164.7	319.4	187.6

lengthened the growing season and allowed the plants of the late melting site to catch up with those on the normal sites so production was equal on both sites. Production on the 12 dm snowpack site was generally lower than that on either the ungrazed-1 (control) or the 8-foot sites because the soils there are shallower.

Heavy snowpack produces changes in vegetation composition. In the normal years of 1969, 1970, 1971, and 1973 *Festuca idahoensis, Danthonia intermedia*, and *Lupinus argenteus* seem to have decreased (Table 3) on the 9-foot site while small annual forbs have increased. The equilibrium condition is discussed by Weaver (1974) and Weaver and Super (1973).

BELOWGROUND PLANT BIOMASS

Belowground biomass was measured in 1970, 1972, and 1973 on the grazed and ungrazed sites. The general method used is described by Swift and French (1972): ten 2.05-cm soil cores were taken in randomized blocks on each treatment at each sampling date. These were divided into 10-cm increments and soaked in a "Calgon" solution. In 1972 and 1973 the roots were washed out (0.5 mm-40 mesh screen plus decantable organic material), dried at 60°C, weighed, ashed (600°C), and reweighed. Washing and ashing were done at the Bridger Site in 1970 and 1972 and at the Pawnee Site in 1973. In Tables 5 and 6 all data are expressed as ash-free weights. Samples for 1970 were not ashed and therefore appeared heavy; they were adjusted downward by the factor 0.36 (November 1972 ash-free weight/total root weight). Dry root weights were not recorded for the first four sample periods in 1972 and were estimated by multiplying ash weights by the 0.57 (November 1972 ash-free weight/ash weight).

Table 5. Belowground biomass ($g/m^2/dm$) on the ungrazed[a/] Bridger Site: 1973. Ash-free weights with mean ash-free weights are presented. Washing and ashing were done by the Natural Resource Ecology Laboratory.

Sample Depth	13 June			24 July[b/]			18 September		
	Ave.	Rep. 1	Rep. 2	Ave.	Rep. 1	Rep. 2	Ave.	Rep. 1	Rep. 2
0-10 cm	793	576	1009	1237	1061	1413	934	711	1098
	99	334	526	101	399	485	89	281	305
10-20 cm	206	255	159	607	693	522	300	265	334
	32	203	37	59	281	229	47	101	177
20-30 cm	118	111	124	361	354	369	174	109	239
	10	43	49	37	135	187	28	48	106
30-40 cm	113	105	120	257	292	223	124	113	135
	13	54	52	48	278	67	14	39	48
	--	--	41	110	134	86	101	82	119
	--	--	51	25	143	45	14	48	40
0-50 cm[c/]	1271	1088	1453	2572	2534	2613	1533	1340	1925

[a/] Root biomasses were sampled on the grazed site on 13 June. The average belowground biomasses on the grazed-1 treatment were: 0-10 cm 1043 ± 350, 10-20 cm 341 ± 147, 20-30 cm 173 ± 88, 30-40 cm 136 ± 104, 40-50 cm 45 ± 31, and 0-50 cm 1738 g/m^2. On the grazed-2 treatment the average belowground biomasses were: 0-10 cm 573 ± 224, 10-20 cm 273 ± 214, 20-30 cm 134 ± 81, 30-40 cm 84 ± 34, 40-50 cm 53 ± 48 and 0-50 cm 1117 g/m^2.

[b/] A 0-10 cm sample was taken on 9 July; the average belowground biomass recorded was 2504 g/m^2 with a standard error of 48 g/m^2.

[c/] Biomass given in $g/m^2/5$ dm.

Table 6. Belowground biomass (g/m^2/dm) at the Bridger Site for ungrazed (U) and grazed (G) treatments: 1970 and 1972. Each datum is the mean of 10 samples.

Depth	Replicate	10 Sept 1970[a/]		20 June 1972[b/]		18 July 1972[b/]		8 August 1972[b/]		6 Sept 1972[b/]		8 Nov 1972[c/]	
		U	G	U	G	U	G	U	G	U	G	U	G
0-10	1	896	800	881	1365	986	1400	813	1384	830	1072	1031	940
	2	990	807	641	1211	1177	1314	830	882	952	1141	788	788
	Ave.	943	803	762	1288	1081	1357	821	1133	891	1106	909	864
10-20	1	637	392	329	416	381	744	260	329	242	277	394	243
	2	537	414	433	277	363	312	242	242	242	381	394	273
	Ave.	587	403	381	346	372	528	251	285	242	329	394	258
20-30	1	650	331	242	260	242	518	156	208	170	191	121	91
	2	562	383	312	277	225	225	138	156	138	242	121	121
	Ave.	606	357	277	268	233	371	147	182	154	216	121	106
30-40	1	681	285	156	156	122	398	138	138	122	122	91	30
	2	555	427	294	122	156	104	104	69	69	138	30	61
	Ave.	618	356	225	135	135	250	122	104	95	130	60	45
40-50	1	614	301	104	122	87	329	69	87	104	104	152	61
	2	543	353	225	87	52	87	52	35	35	52	30	61
	Ave.	578	327	165	104	69	208	60	61	69	78	91	61
0-50	1	3478	2109	1712	2319	1818	3299	1436	2146	1468	1766	1789	1365
	2	3187	2384	1905	1974	1973	2042	1366	1384	1436	1954	1363	1304
	Ave.	3332	2246	1808	2146	1895	2670	1401	1765	1452	1860	1576	1334

a/ 1970 data: Values for lower layers appear high. They were estimated from unashed root weights by multiplying them by 0.36, the ratio of ash-free to total weight on 8 November 1973. The 0.36 ratio was used throughout despite the fact that it rose to 0.43 in the 10-50 cm layer.

b/ 1972 data: Estimated by multiplying ash weights by 0.57, the ratio of ash-free weight to ash weight in the first 10 cm of the soil on 8 November 1973. The 0.57 ratio was used throughout despite the fact that it rose to 0.91 in the 10-50 cm layer.

c/ 1972 data: Calculated from ash-free weights by multiplying by 3031.22, the factor for converting a 2.05-cm diameter core to 1 m^2.

Belowground biomass (0-50 cm) at the Bridger Site is in the 1000 to 3000 g/m^2 range: at maximum standing crop aboveground biomass is unlikely to exceed 20% of the total live material even if one assumes that 50% of the belowground material is dead. The quantity of organic matter per horizon declines with depth: of the material in the first 50 cm the first through fifth decimeter layers contain approximately 59%, 19%, 10%, 7%, and 5%, respectively.

Belowground biomass is apparently highest at mid-summer (18-24 July) and falls continually through late summer, fall, and winter. If one estimates root production as maximum minus minimum standing crop 1350 g were produced in 41 days in 1973 (Table 5). This suggests that (i) 80% of the total annual production is below ground and that (ii) productivities of mountain grass meadows may exceed 30 g/m^2/day. Though we have no early spring data for 1972 trough-peak analysis of 1972 data (Table 6) suggests minimum belowground 1972 belowground production of 500 g/m^2/year.

Belowground biomass is apparently greater on the grazed site than on the ungrazed site: of the seven times belowground biomass was measured on both sites (Tables 5 and 6), the highest average biomass was found on the grazed site in five cases.

ARTHROPODS

Arthropods were collected at the Bridger Site in 1969, 1972, and 1973. In 1969 the site was periodically sampled with a sweep net to inventory the insects: specimens were identified, counted, and preserved (N. Anderson personal communication, Montana State Univ.). In 1972 samples were collected according to the methods outlined in Swift and French (1972). Ten grazed plots and ten ungrazed plots (0.5 m^2) were sampled on each of five sampling periods; rep 1 was sampled on Mondays and rep 2 was sampled on Wednesdays of alternate weeks throughout the summer. Each plot was quick trapped, vacuumed, clipped, revacuumed, and cored for soil microarthropods (core = 5 cm dia × 10 cm). Litter and clippings were extracted with Berlese funnels; though small (8 to 18 cm diameter) their efficiency appears to have exceeded 95%. Soil cores were extracted in a Merchant and Crossley extractor (1970). The total dry weight of plants in the plots sampled and estimated percentage composition were recorded for later attempts to correlate insect numbers with amount and composition of vegetation. In 1973 reps 1 and 2 of the ungrazed site were sampled on six occasions: Wednesdays of alternate weeks throughout the summer. Due to limited funds sample plots were quick trapped and vacuumed, but not clipped. Material gathered was extracted with the Berlese funnels of 8-cm diameter.

To estimate numbers of soil macroarthropods at depths greater than 10 cm, 10 cores (2-cm diameter) were taken in each treatment area on 25 July and 6 September 1972. Arthropods not immediately apparent were sorted out by soaking in "Calgon" solution, wet sieving (0.5-mm screen), and floating in a saturated solution of Epsom salts.

Insect weights were determined by drying pickled insects to constant weight at 80°C. The weights are high by the amount of glycerine sticking to their bodies and low by the amounts of lipid extracted from their bodies by the alcohol.

Insects associated with common plants of the Bridger Site (*Festuca idahoensis*, *Gaillardia aristata*, *Lupinus argenteus*, *Oxytropis sericea*, and *Achillea millefolium*) were determined by collecting individuals in plastic bags and extracting their associates in a modified Berlese apparatus.

Similar work was done with *Festuca idahoensis*, *Agropyron spicatum*, *Stipa viridula*, *Tragopogon dubius*, *Artemisia tridentata*, and *Artemisia frigida* from lower *Agropyron spicatum-Festuca idahoensis* grasslands.

Respiration rates of three ant species not present on the site were determined to develop methods for studying insect respiration in 1973: similar results were obtained with a Gilson differential respirometer and the alkali absorption method used in soil respiration studies (Walter 1952).

A preliminary synthesis of 1972 data follows. Data for 1973 are not yet available.

Species identified appear in Appendix Table 24; other important species have been sent to the US National Museum for identification. Average weights of major species are given in Appendix Table 25.

Most of the arthropod work was done at the family level. Major families are listed in Tables 7 and 8 with data on their numbers. Many of the individuals listed as "miscellaneous" have not been identified to family. Those individuals which were identified to family but which are listed as miscellaneous because of their rarity belong to the following families: Coleoptera (Anthieidae, Cerambycidae, Coesinellidae, Elateridae, Mordellidae, Scarabaeidae, and Staphylinidae); Diptera (Bombyliidae, Calliphoridae, Cecidomyiidae, Chloropidae, Lauxaniidae, Rhagionidae, Sarcophagidae, Sepsidae, Tabanidae, and Tachinidae); Hemiptera (Coreidae, Lygaeidae, Fulgoridae, and Scutelleridae); Homoptera (Aleyrodidae, Aphididae, Chermidae, and Phylloxeridae); Hymenoptera (Chalcididae, Mymaridae, and Scelionidae); Lepidoptera (Gelechiidae, Phaloniidae, and Tischeriidae); Orthroptera (all identified); Thysanoptera (none identified); Araneida (none identified); and Acarina (none identified).

Table 7. Average numbers of aboveground arthropods per square meter in grazed and ungrazed fescue meadows on the 1972 dates shown.

Taxon	Life stage[a/]	Grazed 25 June	Grazed 9 July	Grazed 23 July	Grazed 6 Aug	Grazed 20 Aug	Ungrazed 25 June	Ungrazed 9 July	Ungrazed 23 July	Ungrazed 6 Aug	Ungrazed 20 Aug
Acarina[b/]				8 spp.					8 spp.		
	00	28.0	34.0	58.0	25.0	151.0	137.0	48.0	10.0	66.0	212.0
Araneida				6 spp.					8 spp.		
	00	1.4	1.0	2.2	0.4	1.2	1.4	1.0	2.2	2.0	3.4
Coleoptera				28 spp.					24 spp.		
Carabidae	10	1.0	0.8	1.4	0.0	1.2	0.6	1.2	0.6	0.0	1.4
Curculionidae	10	1.4	1.0	1.2	1.0	1.0	0.0	1.0	0.6	2.2	2.0
Chrysomelidae	10	0.6	1.6	2.4	1.2	0.8	1.2	0.4	0.6	0.8	1.0
Miscellaneous	10	0.2	0.6	2.0	0.8	0.4	0.8	0.2	0.6	1.4	0.8
	40	12.0	5.0	3.4	3.6	1.8	9.2	4.8	1.6	2.8	6.6
Collembola				1 spp.					1 spp.		
Entomobryidae	10	0.0	0.2	0.4	0.6	0.8	1.8	1.0	0.0	2.4	2.4
	40	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	1.0	0.2
Diptera				21 spp.					10 spp.		
Miscellaneous	10	1.0	0.0	2.0	1.8	0.6	0.4	0.0	0.8	0.4	1.4
	40	3.8	3.2	1.8	0.6	1.2	1.0	0.2	1.8	2.0	9.8
Hemiptera				17 spp.					21 spp.		
Miridae	10	0.8	6.2	5.0	6.4	4.4	0.0	14.4	10.4	6.6	2.4
	40	0.0	0.0	1.8	3.0	1.0	0.0	0.4	0.2	0.6	0.4
Nabidae	10	0.0	0.0	0.2	0.2	0.8	0.0	0.0	0.8	0.0	1.2
	40	0.0	0.0	4.2	0.2	1.4	0.0	0.0	0.0	0.4	1.6
Pentalomidae	10	0.6	0.0	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.1
	40	0.0	0.0	0.6	3.4	2.0	0.0	0.0	3.2	3.4	0.8
Miscellaneous	10	0.0	0.6	0.0	0.6	1.2	1.0	0.4	0.6	0.0	0.0
	40	4.2	2.6	2.0	3.2	1.8	7.6	1.4	3.2	1.2	0.2
Homoptera				16 spp.					16 spp.		
Cicadellidae	10	3.6	3.6	1.6	1.4	11.8	4.8	4.2	0.2	2.0	6.0
	40	4.2	4.8	11.6	30.8	25.4	5.8	6.6	4.0	11.2	17.0
Miscellaneous	00	1.0	0.0	0.0	1.6	0.0	1.6	0.0	0.0	0.4	0.0
	10	0.0	0.6	0.4	0.0	0.0	0.0	0.2	2.0	0.0	0.0
	40	1.2	2.8	3.2	0.0	2.6	0.2	0.2	0.0	0.0	2.2
Hymenoptera				27 spp.					24 spp.		
Formicidae	10	17.2	23.2	46.8	4.8	4.8	17.8	22.0	7.4	9.0	4.6
Miscellaneous	10	0.4	0.0	1.4	1.6	0.2	1.6	0.0	0.2	1.2	1.0
	40	0.8	1.0	1.0	0.2	0.0	3.0	0.4	0.2	0.2	0.2
Lepidoptera				5 spp.					6 spp.		
Miscellaneous	10	0.0	0.0	0.4	0.6	0.0	0.8	0.0	0.0	1.2	2.6
	40	2.8	3.0	2.2	0.6	0.4	3.6	2.2	0.6	0.6	1.4
Orthoptera				4 spp.					5 spp.		
Locustidae	10	0.0	0.8	0.6	0.2	0.4	0.0	0.4	1.2	1.0	1.0
	40	2.8	1.0	0.8	1.2	0.0	1.0	0.6	1.2	0.2	0.2
Tettigoniidae	10	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.2
	40	1.4	1.2	0.6	0.6	0.2	1.0	0.0	0.6	0.2	0.0
Thysanoptera[b/]				? spp.					? spp.		
	00	73.0	75.0	151.0	104.0	40.0	5.0	36.0	117.0	53.0	53.0

[a/] Life stages are 00 = unknown, 10 = adult, and 40 = larval.

[b/] Data for Thysanoptera and Acarina are rounded to the nearest whole animal/m^2.

Table 8. Average numbers of soil arthropods per square meter in grazed and ungrazed fescue meadows on the 1972 dates shown.

Taxon	Life stage[a]	Grazed				Ungrazed			
		9 July	23 July	6 Aug	20 Aug	9 July	23 July	6 Aug	20 Aug
					0-5 cm				
Acarina	00	32000	13000	22200	7800	23600	23000	11500	20800
Collembola									
Entomobryidae	10	100	0	100	50	0	0	100	0
	40	1250	400	500	720	1500	900	2050	1700
Poduridae	10	0	0	50	0	0	0	50	0
	40	700	200	100	50	1450	500	650	350
Miscellaneous	40	200	50	0	150	100	0	50	100
Total		2250	650	750	970	3050	1400	2900	2150
Coleoptera									
Miscellaneous	40	100	0	150	100	50	100	50	150
Insects									
Miscellaneous	10	50	50	150	0	100	0	0	50
	40	2000[b]	50	50	150	50	0	300	50
					5-10 cm				
Acarina	00	6550	3000	25600	2450	5650	10050	4250	4400
Collembola									
Entomobryidae	10	0	0	0	0	0	0	200	0
	40	700	900	700	100	50	100	1200	100
Poduridae	10	0	0	100	0	200	150	150	0
	40	50	50	0	200	0	0	350	450
Miscellaneous	40	0	0	0	0	0	100	0	0
Total		750	950	800	300	250	350	1900	550
Insects									
Miscellaneous	10	0	0	100	0	150	100	0	0
	40	0	0	200	0	50	0	200	250

[a] Life stages are: 00 = unknown, 10 = adult, 40 = larval.

[b] This sample included 1850 Homoptera (Phylloxeridae).

Table 7 summarizes the data on aboveground arthropod numbers. Table 8 summarizes the relatively high belowground arthropod numbers. Though macroarthropods have been seen in soil pits of various sorts, none were found in the cores taken for estimation of their numbers at depths greater than 10 cm.

Orders seem to be similarly represented on the grazed and ungrazed sites. Numbers of species of Coleoptera, Diptera, and Hymenoptera were highest on the grazed site while species of Hemiptera, Lepidoptera, Orthoptera, and Araneida were more numerous on the ungrazed site.

Numbers of individuals within families also differ little between the grazed and ungrazed sites above ground; the Orthoptera (Tettigoniidae) and the Thysanoptera may be slightly more numerous on the grazed site while the Collembola (Entomobryidae) and the Acarina may be more numerous on the ungrazed site.

The insect fauna changes relatively little between late June and early September. Hemipteran (Miridae, Namidae, and Penttomidae) may increase as the season progresses. Adult Homopteran (Cicadellidae) may decline at midsummer and are high especially at summer's end.

At the order and family level the insect associates of different herbs of a fescue grassland are similar (Table 9). Thysanopterans are easily the most abundant associates of the herbs studied in 1972. The numbers of Thripidae on the average lupine plant may be higher than on other plants because lupine plants are larger than the others. Phoeothripidae are rare except on *Achillea*. Arachnids (spiders and mites), Hemipterans, and Hymenopterans seem equally common on all four species. Further sampling might demonstrate positive associations (i) of Chermidae

Table 9. Average numbers of arthropods present on four forb species of the Bridger Site, summer 1972. Sample size = five plants.

Taxon	Date	Thysanoptera			Coleoptera	Diptera	Hemiptera	Homoptera		Hymenoptera		Lepidoptera	Arachnida
		Aeolothripidae	Phoeothripidae	Thripidae				Aphidae	Other	Formicidae	Other		
Lupinus argenteus Pursh.	26 July	20	--	1003	--	4	1	--	--	--	--	4	1
	7 Aug	--	--	593	--	2	1	--	--	7	--	1	--
	25 Aug	11	--	107	--	--	1	13	--	7	--	1	1
	7 Sept	2	--	15	--	--	--	--	--	--	--	2	--
Oxytropis sericea Nutt.	26 July	--	--	220	1	--	--	1	--	1	--	--	--
	7 Aug	--	--	3	1	--	--	--	--	1	--	--	--
	25 Aug	--	--	11	--	--	--	--	--	1	--	--	--
	7 Sept	23	2	61	28	1	1	2	--	12	--	2	1
Achillea millefolium L.	26 July	1	--	10	--	--	--	1	1	1	--	--	--
	7 Aug	--	4	91	--	--	--	4	2	4	1	--	1
	25 Aug	--	--	54	--	--	--	3	--	2	--	--	--
	7 Sept	--	74	54	1	--	5	2	9	1	--	1	--
Gaillardia aristata Pursh.	7 Aug	2	--	117	--	--	1	4	--	1	--	2	1
	25 Aug	--	--	298	1	--	15	1	--	--	1	2	--
	7 Sept	--	--	6	--	--	--	5	--	--	1	--	--

(Homopteran other) with *Achillea* or (ii) Dipterans and immature Lepidopterans with *Lupinus* (iii) of Curculionidae (Coleoptera) with *Oxytropis*, and (iv) of aphids with Composites: the relatively small and composites (*Achillea* and *Gaillardia*) seem to have more aphids than larger leguminous plants (*Oxytropis* and *Lupinus*). Though the 1973 data have not yet been tabulated, it appears that the insects associates of the grass *Festuca idahoensis* are fewer than those of the forbs discussed above. Thrips, mites and labops are among these; their possible importance is suggested by Tingey et al. (1972) and Haws et al. (1973).

Ant respiration rates increase with increasing temperature (Table 10), increasing heaviness of the soil, and decreasing population density. The rates observed in these species were similar to each other as well as similar to values reported in the literature and were about five times greater than those recorded for grasshoppers (Mitchell 1971).

AVES

Introduction and Methods

Avian field studies were conducted in 1970 and 1972 at the Bridger Site. (1) The avian flush plot, grazed treatment, was the only census attempted because of the limited area of the grasslands and the absence of a road system. The same plot was sampled both years (Wiens 1971). The methods used are described in Swift and French (1972). (2) Studies of nestling growth rates of Mountain Bluebirds and White-crowned Sparrows at the site are also reported.

Results and Discussion

Table 11 is a list of birds found on the Bangtail grasslands. Some species, such as the Mourning Dove, Blue Grouse, and Cassin's Finch, are usually seen near the forest edge.

Table 10. Average respiration rates of three ant species at five temperatures: hundredths of a milligram per ant per hour.

Ant	Number	Wet wt (mg)	Dry wt (mg)	6°C	15°C	23°C	33°C	42°C
A	15	12.7	3.2	0.2	2.3	5.8	9.0	12.5
B	8	6.9	2.8	0.2	2.0	4.6	8.2	10.3
C	5	3.9	0.9	0.2	1.8	2.7	4.6	7.1

Table 11. Bird species observed on Bridger grasslands.

Taxon	Common name
Anthus spinoletta	Water Pipit
Bubo virginianus	Great Horned Owl
Carpodacus cassinii	Cassin's Finch
Circus cyaneus	Harrier (Marsh Hawk)
Chordeiles minor	Nighthawk
Corvus corax[a]	Raven
Dendragapus obscurus	Blue Grouse
Eremophila alpestris[a,b]	Horned Lark
Falco sparverius	Kestrel (Sparrow Hawk)
Perisoreus canadensis[a]	Gray Jay
Pica pica	Magpie
Pooecetes gramineus[b]	Vesper Sparrow
Sialia currucoides[a,b]	Mountain Bluebird
Turdus migratorius[a,b]	Robin
Zenaidura macroura	Mourning Dove
Zonotrichia leucophrys	White-crowned Sparrow

[a] Observed on 16 March 1972.

[b] Censused on flush plot.

Robin and Mountain Bluebird observations on 16 March 1972 may be unusually early since that month had been warm and much of the usual Bridger Site snow cover had melted. Skaar (1969) lists 15 March as the usual date for Mountain Bluebird spring arrival in the nearby Bozeman area, about 3,000 feet lower in elevation. The other three species encountered in March may overwinter on the site.

Harriers and Kestrels were observed throughout the summer of 1970 and a number of Harriers were fledged on the site that summer. In 1971 neither species was observed until late September. In 1972, Harriers were first observed on 17 August and Kestrels on 29 August. The heavy and long raptorial use of the site in 1970 may have been a response to the large vole (*Microtus montanus*) population which occurred that year (Haglund 1972).

Table 12 contrasts the flush plot census data for 1970 and 1972. In 1970 the flush plot was run in early July; it was censused in late June and mid-July in 1972. Plot census figures in Table 12 were derived by multiplying actual results by 2 to account for unseen females (Wiens 1971).

The near doubling of bird numbers and biomasses from 1970 to 1972 is notable. Vesper Sparrows and Mountain Bluebirds accounted for most of the increase; Horned Lark and Robin numbers were nearly constant. Commensurate with the Vesper Sparrow increase was a drop in average territory size from 1.96 ha in 1970 to 0.49 ha in 1972. Huxley (1934) and Zimmerman (1970) have also observed this phenomenon.

That the Vesper Sparrow population increase from 1970 to 1972 is real is suggested by both the census and the diminished average territory size. This may be explained by increased availability of food due to a

Table 12. Bridger Site avian flush plot data, 1970[a] and 1972. Grazed treatment (10.6 ha grid).

Species	Year	Plot census (individual/ study plot)	Birds/ 100 ha	Area Occupied (ha)[b]	Territory size (ha)[c]	Standing crop (g/ha)
Horned Lark	1970	1.92	18.1	2.7 (26)	2.82 (1)	5.8
	1972	1.50	14.1	1.8 (17)	1.09 (1)	4.5
Mountain Bluebird	1970	1.68	15.8	3.6 (34)	--	4.9
	1972	4.50	42.4	4.1 (39)	--	13.2
Robin	1970	2.24	21.1	5.5 (52)	--	16.6
	1972	3.00	28.3	3.2 (30)	--	22.2
Vesper Sparrow	1970	5.70	53.8	5.6 (53)	1.96 (3)	12.8
	1972	13.50	127.2	6.7 (64)	0.49 (8)	30.2
Total	1970		108.8			40.1
	1972		212.1			70.0

[a] 1970 data from Wiens (1971).

[b] % of study plot in parentheses.

[c] Sample size in parentheses.

warm spring, an early snow melt, and good insect production (?) allowing more efficient Vesper Sparrow foraging (Watt 1968).

Even at greater density much of the study plot (36%) was unused by the Vesper Sparrows. Sutton (1960) described the reliance of Vesper Sparrows on "blow-out" areas which are absent from the unused portion of the Bridger plot. Every Vesper Sparrow and Horned Lark territory at the site included at least one "blow-out" area.

Though no active search was made, eight nests were discovered on the grasslands, of which one was on the flush plot. Four were Vesper Sparrow nests: two were found in clumps of *Agropyron subsecundum*, (each with three eggs), one in a *Festuca idahoensis* clump (five eggs), and one under an *Artemisia tridentata* bush (four eggs). Both White-crowned Sparrow nests were amidst patches of *Lupinus argenteus* (each with four eggs). One Mountain Bluebird nest (six eggs) was encountered in a pile of discarded fence posts and another was found in the IBP weather station shelter (five eggs).

Tables 13 and 14 record the weight increases observed in nestlings of White-crowned Sparrows and Mountain Bluebirds (one nest each). The young bluebirds spent a greater amount of time in the nest than the sparrows did. Delayed development is often more characteristic of brush and tree nesters than ground nesting species, such as the White-crowned Sparrows (Ricklefs 1968). However, White-crowned Sparrows occasionally nest in shrubs (Peterson 1969). Nestlings in other nests were weighed but desertion or predation halted those studies.

MAMMALS

Mammal studies were conducted at the Bridger Site in 1970, 1971, 1972, and 1973. The methods used generally followed Swift and French

Table 13. Growth of White-crowned Sparrow nestlings, Bridger Site. 28 June to 15 July, 1972.

Day	Number	Weight (g)	Standard deviation	Minimum weight (g)	Maximum weight (g)
0	1	3.0	0.0	3	3
5	4	11.0	1.4	10	12
10	2	22.5	0.7	22	23

Table 14. Growth of Mountain Bluebird nestlings, Bridger Site. 22 June to 15 July, 1972.

Day	Number	Weight (g)	Standard deviation	Minimum weight (g)	Maximum weight (g)
2	5	7.2	3.3	5	9
10	5	22.6	6.1	17	25
15	5	25.6	2.5	24	27
20	4	28.2	2.2	27	30
25	1	24.0	0.0	24	24

(1972). This report presents (i) a list of mammals present, (ii) density and biomass data for the commonest mammals, and (iii) a discussion of some of their impacts.

Small mammals were trapped on five subsites (Appendix Table 26): one ungrazed site (5), two cattle-grazed (3,4) sites, and two sheep-grazed (1,2) sites. Sites 1 and 5 were the IBP sites trapped by Hoffman et al. (1971) and generally reported in the "official data." Small mammal numbers were estimated on live-trap grids with 15 m intervals. "IBP grids" were 12 × 12; "weather modification grids" were of similar size, but had shapes adjusted to fit available homogeneous meadow space. Assessment lines were used on 1972 IBP grids. Trapping dates are summarized in Appendix Table 27.

Pocket gopher numbers were estimated in 1970, 1971, and 1972 by the "48-hour mound-building index" of Reid et al. (1966). Their earth-moving activity was estimated (Haglund 1972) by weighing and measuring the new mounds and plugs appearing in 48 hours in 11 of the 15 × 15 m squares on each grid: one square was chosen at random from each row of the grid.

Mule deer numbers were estimated in 1972 by a variant of the "jackrabbit census" method (Swift and French 1972): all deer in a 0.36 × 11.27 km (1200 ft × 7 mi) rectangle were counted on 4, 13, and 15 August 1972.

Estimates of sheep and cattle use are derived from US Forest Service records.

Results and Discussion

Mammals observed on the site are listed in Table 15. Of the 22 species listed, eight were trapped on the grids. Several species listed (*Alces*, *Clethrionomys*, *Eutamius*, *Lasionycteris*, *Lepus americanus*, *Lynx*, *Tamiasciurus*, and *Ursus*) are forest residents which make little use of the meadows.

Small mammal population size and biomass estimates were made for three species: *Microtus montanus* (Table 16), *Peromyscus maniculatus* (Table 17) and *Thomomys thalpoides* (Table 18). Estimates are probably low since they include only individuals actually trapped.

Small mammal numbers were similar on grazed and ungrazed sites. *Microtus* (Table 16) were apparently more numerous on the grazed site in a "high" year (1970) and more numerous on the ungrazed site in a "low" year (1972-1973). *Peromyscus* numbers (Table 17) were also higher on the grazed site in a "high" year (1972) and lower there in a "low" year (1973). The same trend may exist in the *Thomomys* data (Table 19): on the grazed site gopher numbers were highest in a "high" (1970) and lowest in the 1971-1972 "low." The data show no clear differences in the effects of sheep and cattle grazing on population sizes of voles, deer mice, or pocket gophers.

The size of small mammal populations varied considerably between years. *Microtus* populations were high (20-40 individuals/ha) in 1970 and low (1-15/ha) in 1971-1972. *Thomomys* populations were also high (15-40/ha) in 1970 and low (1-10/ha) in 1973. *Peromyscus* populations, on the other hand, were low (0-1/ha) in 1970 and relatively high (15-20/ha) in 1972. Total small mammal biomass dropped from 3500 g/ha in 1970 to less than 100 g/ha in 1972.

Table 15. Bridger Site mammal species list.

Species	Common name	Trapped on grids
Alces alces	Moose	
Canis latrans	Coyote	
Cervus canadensis	Elk	
Clethrionomys gapperi	Red-backed vole	X
Erethizon dorsatum	Procupine	
Eutamias amoenus	Yellow pine chipmunk	X
Lasionycteris noctivagans	Silver-haired bat	
Lepus americanus	Snowshoe hare	
Lepus townsendii	White-tailed jackrabbit	
Lynx rufus	Bobcat	
Microtus montanus	Montane vole	X
Mustela erminea	Short-tailed weasel	X
Neotoma cinerea	Bushy-tailed wood rat	
Odocoileus hemionus	Mule deer	
Peromyscus moniculatus	Deer mouse	X
Sorex cinereus	Masked shrew	X
Spermophilus richardsonii	Richardson's ground squirrel	
Tamiasciurus hudsonicus	Red squirrel	
Taxidea taxus	Badger	
Thomomys talpoides	Northern pocket gopher	X
Ursus americanus	Black bear	
Zapus princeps	Western jumping mouse	X

Table 16. *Microtus montanus* trapping results: 1970-1973. Number of individuals captured, density (individuals/ha), and biomass estimates (g/ha) for each trapping period.[a,b]

Trapping date	Sheep-grazed						Cattle-grazed						Ungrazed		
	Grid 1			Grid 2			Grid 3			Grid 4			Grid 5		
	Number	Density	Biomass	Number	Density	Biomass	Number	Density	Biomass	Number	Density	Biomass	Number	Density	Biomass
July 1970	43.0	15.8[c]	326.4	2.0	0.8	16.5	29.0	13.3	274.8				24.0	8.8	181.8
Aug 1970				4.0	1.5	31.0	43.0	19.7	407.0						
Sept 1970				6.0	2.3	47.5	16.0	7.3	150.8						
June 1971	1.0	0.4	8.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
July 1971	2.0	0.8	16.5	0.0	0.0	0.0	1.0	0.5	10.33	1.0	0.4	8.3			
Aug 1971	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Sept 1971	0.0	0.0	0.0	0.0	0.0	0.0	4.0	1.8	37.2	1.0	0.4	8.3			
July 1972	1.0	0.4	8.3										3.0	1.1	22.7
Aug 1972[d]	0.0	0.0	0.0										8.0	2.9	59.9
Aug 1972[e]	1.0	0.4	8.3										14.0	5.2	107.4
Sept 1972	1.0	0.4	8.3										12.0	4.4	90.9
Aug 1973	1.0	0.4	8.3										4.0	1.5	31.0

a/ Population estimates equal the number of different individuals captured on the grids.

b/ Mean weight of *Microtus* from Hoffman et al. (1970) = 20.66 g.

c/ Number of individuals removed from the grid by snap-trapping.

d/ Early August

e/ Late August

Table 17. *Peromyscus maniculatus* trapping results: 1970-1973. Number of different individuals captured, density (indiv./ha) and biomass (g/ha) for each trapping period[a,b].

Trapping date	Sheep-grazed						Cattle-grazed						Ungrazed		
	Grid 1			Grid 2			Grid 3			Grid 4			Grid 5		
	Number	Density	Biomass	Number	Density	Biomass	Number	Density	Biomass	Number	Density	Biomass	Number	Density	Biomass
July 1970	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5	9.3				0.0	0.0	0.0
Aug 1970				0.0	0.0	0.0	0.0	0.0	0.0						
Sept 1970				0.0	0.0	0.0	1.0	0.5	9.3						
June 1971	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5	9.3	2.0	0.7	13.0			
July 1971	2.0	0.7	13.0	2.0	0.8	14.9	2.0	0.9	16.7	2.0	0.7	13.0			
Aug 1971	1.0	0.4	7.4	3.0	1.1	20.5	4.0	1.8	33.5	4.0	1.4	26.0			
Sept 1971	1.0	0.4	7.4	4.0	1.5	27.9	2.0	0.9	16.7	4.0	1.4	26.0			
July 1972	23.0	8.5	158.1										15.0	5.5	102.3
Aug 1972[c]	16.0	5.9	109.7										14.0	5.2	96.7
Aug 1972[d]	14.0	5.2	96.7										14.0	5.2	96.7
Sept 1972	18.0	6.6	122.8										14.0	5.2	96.7
Aug 1973	2.0	0.7	13.0										8.0	2.9	53.9

[a] Population estimates equal the number of different individuals captured on the grids.

[b] Mean weight of *Peromyscus* (18.6 g) from Hoffman et al. (1971).

[c] Early August

[d] Late August

Table 18. *Thomomys talpoides* population size (indiv./ha) and biomass (g/ha) by 48-hour mound counting method[a,b].

Trapping date	Sheep-grazed				Cattle-grazed				Ungrazed	
	Grid 1		Grid 2		Grid 3		Grid 4		Grid 5	
	Density	Biomass	Density	Biomass	Density	Biomass	Density	Biomass	Density	Biomass
July 1970	43.5[c]	2426.5							15.6	870.2
Aug 1971	14.5	808.8	63.5	3542.0	26.6	1484.0	22.8	1271.8		
Sept 1971									24.6	1372.2
Aug 1972	1.2	66.9	63.0	3492.0	17.0	937.0			9.3	518.8

[a] Population size equals the total number of mounds produced in 48 hours divided by 8.2 (Reid et al. 1966).

[b] Mean weight of *Thomomys* (55.8 g) from Hoffman et al. (1971).

[c] Estimate (low) from Hoffman et al. (1970).

The crudely inverse relationship of *Peromyscus* and *Microtus* numbers may represent a negative behavioral interaction of the two species. *Microtus* may be behaviorally dominant and act to exclude *Peromyscus* from the Bridger grasslands during *Microtus* highs (see Grant 1972 and Douglass 1970). Baker (1971) discounts the possibility of competition between such nutritionally distinctive species.

The hypothesis that the high vole and gopher numbers of 1970 were due to late melting of the protective snow cover will be explored. Steinhoff's data (1973, 1976) suggest the opposite trend: both *Microtus* and *Peromyscus* increased in the San Juan Mountains with decreasing amounts of snow. In agreement with Haglund (1972) and in disagreement with Weaver (1974), Steinhoff (1973, 1976) found "a slight indication of higher gopher populations on otherwise comparable sites where the snow lies later." His pocket gopher populations appeared to decline in snowfall as well.

Large herbivores on the area include sheep, cattle, mule deer, elk, and moose. Stocking rates for sheep and cattle are 1.16 acres and 6.6 acres per animal month, respectively. *Alces alces* and *Cervus canadensis* are relatively rare. *Odocoileus hemionus* is commonly seen in forb-rich meadows. An average of nine individuals were seen in the three strip censuses made in August 1972 so one might estimate their numbers at 0.02 individuals per hectare. If the average Montana mule deer weighs 63.5 kg (Mackie 1964), deer biomass can be estimated at 1387 g/ha. This is surely an overestimate because besides foraging in the meadows the deer probably use the forested parts of their habitat.

The primary effects of most mammals on the area are grazing effects; pocket gophers also affect vegetation and soil forming processes by burrowing (Turner 1973). In the later summer of 1972 on grid 3 the fossorial rodents covered about 0.1% of the ground surface daily with fresh mound earth (Table 19). This is equivalent to 1925 cm^2/gopher day or 4.9 kg/gopher day. Buchanan (1972) found that 2% of Bangtail meadows might be covered by winter mounds at one time and that 1% to 3% might be covered by summer mounds. These data are compatible with suggestions that pocket gophers can move 5 to 38 tons of soil per acre per year (Ellison 1946, Richens 1966).

Table 19. Bridger Site pocket gopher mound area and weight survey, 16 to 18 August 1972.

Treatment	Mound size	Mound weight
Grid 1, grazed	$\bar{X}$ = 942.2 cm^2 SD = 2312.6 No. = 19	$\bar{X}$ = 1.94 kg SD = 1.53 No. = 19
Grid 5, ungrazed	$\bar{X}$ = 459.2 cm^2 SD = 379.5 No. = 126	$\bar{X}$ = 1.20 kg SD = 1.12 No. = 122

ACKNOWLEDGMENTS

This work was supported from 1969 to 1973 by NSF grants GB-7302 and GB-20960 to study the ecological effects of winter weather modification and in 1970, 1972, and 1973 by the US/IBP Grassland Biome. Principal contributors were: S. Arthun (site foreman, 1971), I. Bordeau (site foreman, 1972), W. Burleson (insects), D. Collins (principal investigator), C. Deschamps (plant survey), R. Dumond (insects), F. Forcella (site co-foreman, 1973), B. Haglund (birds and mammals), J. Howell (roots and soil respiration), R. Smith (site foreman, 1969), L. Taylor (site foreman, 1970), and T. Weaver (principal investigator). Field crew members not listed above include: in 1968, W. Ballard, L. Jonas, R. Smith; in 1969, S. Arthun, W. Ballard, B. Miller; in 1970, S. Arthun, J. Bernd, S. Geary; in 1971, J. Bernd, I. Bordeau, L. Taylor; and in 1972, P. Abrams, C. Barry, K. Kueffler, M. Nichols, K. Ulrich. I. Bordeau and L. Taylor, with the help of T. Hancock, N. Deschamps, and members of the field crews listed above, have assembled and verified many of the tables presented in this report.

LITERATURE CITED

Baker, R. 1971. Nutritional strategies of myomorph rodents in North American grasslands. J. Mammal. 52:800-805.

Buchanan, B. 1972. Ecological effects of weather modification, Bridger Range area, Montana: Relationships of soil, vegetation, and microclimate. Ph.D. Diss. Montana State Univ., Bozeman. 136 p.

Collins, D. D. 1970. Comprehensive Network Site description, BRIDGER. US/IBP Grassland Biome Tech. Rep. No. 38. Colorado State Univ., Fort Collins. 10 p.

Collins, D. D. 1971. The Bridger Site, 1970 progress report. US/IBP Grassland Biome Tech. Rep. No. 84. Colorado State Univ., Fort Collins. 40 p.

Collins, D. D., and T. W. Weaver III. 1972. Grassland Biome studies at the Bridger Site, 1971. US/IBP Grassland Biome Tech. Rep. No. 198. Colorado State Univ., Fort Collins. 21 p.

Douglass, R. 1970. A field study of interactions between montane moles, *Microtus montanus nexus*, Hall and Hayward, and deer mice *Peromyscus maniculatus sonoriensis*, Le Conte, in northern Utah. M.S. Thesis. Univ. Utah, Salt Lake City. 44 p.

Ellison, L. 1946. The pocket gopher in relation to soil erosion on mountain range. Ecology 27:101-114.

French, N. 1970. Field data collection procedures for the comprehensive network, 1970. US/IBP Grassland Biome Tech. Rep. No. 35. Colorado State Univ., Fort Collins. 37 p.

Grant, P. 1972. Interspecific competition among rodents. *In* R. F. Johnston, P. W. Frank, and C. D. Michener [ed.] Ann. Review of Ecol. and Syst. 3:79-106.

Haglund, B. 1972. Ecological effects of weather modification, Bangtail Ridge, Bridger Range, Montana: Relationships of pocket gophers (*Thomomys talpoides*) to time of snow melt. M.S. Thesis. Montana State Univ., Bozeman. 26 p.

Haws, B., D. Dwyer, and M. Anderson. 1973. Problems with range grasses: Look for black grass bugs. Utah Science 34:3-9.

Hoffman, R., J. Jones, and H. Genoways. 1971. Small mammal survey on the Bison, Bridger, Cottonwood, Dickinson, and Osage Sites. US/IBP Grassland Biome Tech. Rep. No. 109. Colorado State Univ., Fort Collins. 69 p.

Huxley, J. 1934. A natural experiment on territorial instinct. Brit. Birds 27:270-277.

Mackie, R. 1964. Montana deer weights. Montana Wildlife Winter, 1964.

Marshall, J. 1967. The effect of shelter on the productivity of grasslands and field crops. Field Crop Abstr. 20:1-14.

Merchant, V., and D. Crossley. 1970. An inexpensive, high-efficiency Tullgren extractor for soil microarthropods. J. Georgia Entomol. Soc. 5:83-87.

Mitchell, J. 1971. Consumption and metabolic rates of some leaf-eating, chewing arthropods: A summarized literature review. US/IBP Grassland Biome Tech. Rep. No. 118. Colorado State Univ., Fort Collins. 4 p.

Mueggler, W. 1971. Weather variations on a mountain grassland in southwestern Montana. USDA Forest Serv. Res. Paper INT 99. Intermountain Forest and Range Exp. Sta., Ogden, Utah. 25 p.

Mueggler, W. 1972. Plant development and yield on mountain grasslands in southwestern Montana. USDA Forest Serv. Res. Paper INT 124. Intermountain Forest and Range Exp. Sta., Ogden, Utah. 20 p.

Mueggler, W., and W. Handl. 1973. Preliminary classification of mountain grassland and shrubland habitat types in southwestern Montana. Progress Report. USDA Forest Serv., Intermountain Forest and Range Exp. Sta., Ogden, Utah. 52 p.

Peterson, R. 1969. A field guide to western birds. Houghton-Mifflin, Boston.

Reid, V., R. Hansen, and A. Ward. 1966. Counting mounds and earth plugs to census mountain pocket gophers. J. Wildlife Manage. 30:327-334.

Richens, V. 1965. An evaluation of control on the Wasatch pocket gopher. J. Wildlife Manage. 29:327-334.

Ricklefs, R. 1968. Patterns of growth in birds. Ibis 110:419-451.

Skaar, P. 1969. Birds of the Bozeman latilong. P. D. Skaar. Bozeman, Montana.

Steinhoff, H. 1973. Pocket gopher populations. *In* H. Teller, J. Ives, and H. Steinhof [ed.] The San Juan Ecology Project. Colorado State Univ., Fort Collins. 173 p.

Steinhoff, H. 1976. Effects of varying snowpack on small mammals, p. 437-485. *In* H. Steinhof and J. Ives [ed.] Ecological impacts of snowpack augmentation in the San Juan Mountains of Colorado. Colorado State Univ., Fort Collins.

Sutton, G. 1960. The nesting Fringillids of the Edwin S. George Reserve, southeastern Michigan. Port. U. Jack-pine Warbler, 38:3-15.

Swift, D. M., and N. R. French. 1972. Basic field data collection procedures for the Grassland Biome, 1972 season. US/IBP Grassland Biome Tech. Rep. No. 145. Colorado State Univ., Fort Collins. 86 p.

Tingey, W., C. Jorgensen, and N. Frischknecht. 1972. Thrips of the sagebrushgrass range community in west central Utah. J. Range Manage. 25:304-308.

Turner, G. 1973. Effects of pocket gophers on the range. *In* G. Turner, R. Hansen, V. Reid, H. Tietjen, and A. Ward [ed.] Pocket gophers and Colorado mountain rangeland. Colorado State Univ. Exp. Sta. Bull. 554S, Fort Collins. 90 p.

U.S. Department of Commerce. 1969-1972. Climatological data: Montana section. Environmental Science Services Administration. U.S. Dep. Commerce, Washington, D.C.

Walter, H. 1952. Eine einfache Methode zyr "okologischen Erfassung des CO_2-Factors am Standort. Ber Deut. Bot. Ges. 70:257-282.

Watt, K. 1968. Ecology and resource management: A quantitative approach. McGraw-Hill. New York.

Weaver, T. 1974. Ecological effects of weather modification: Effect of late snow melt on *Festuca idahoensis* meadows. Am. Midl. Nat. (in press).

Weaver, T., and Super, A. 1973. Ecological consequences of winter cloud seeding. ASCE J. of the Irr and Drainage Div. 99:387-399.

Wiens, J. A. 1971. Avian ecology and distribution in the comprehensive network, 1970. US/IBP Grassland Biome Tech. Rep. No. 77. Colorado State Univ., Fort Collins. 49 p.

Zimmerman, J. 1970. The territory and its density dependent effect in *Spiza americana*. Auk 88:591-612.

APPENDIX I

APPENDIX TABLES

Appendix Table 1. Standing crop (g/m^2) of all live and dead plants: 1969-1973. The means ($\bar{X}$) and standard error (SE) are given. Data from 25 May 1969 are summarized in Appendix Table 20.

Date	Treatment											
	4-ft site		8-ft site		Ungrazed				Grazed			
	1		1		1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
					Early June							
5 June 1969	36	--	--	--	64	--	--	--	--	--	--	--
8 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
15 June 1971	27	18	--	--	82	37	30	10	--	--	--	--
12 June 1972	69	44	95	84	170	44	173	35	197	36	196	46
					Late June							
18 June 1969	--	--	--	--	117	--	--	--	--	--	--	--
22 June 1970	65	21	--	--	84	18	114	26	88	39	98	17
30 June 1971	58	30	23	18	9	24	121	38	--	--	--	--
26 June 1972	124	66	87	53	197	35	240	87	228	57	237	42
21 June 1973	80	11	--	--	171	9	239	43	--	--	--	--
					Early July							
6 July 1969	108	--	96	--	157	--	--	--	--	--	--	--
8 July 1970	93	24	55	38	108	37	125	57	102	31	114	40
13 July 1971	81	40	56	16	152	32	170	41	--	--	--	--
10 July 1972	167	71	154	72	282	54	321	81	282	89	296	78
					Late July							
20 July 1969	82	--	170	--	161	--	--	--	--	--	--	--
26 July 1970	133	52	94	30	132	28	168	50	102	30	152	33
27 July 1971	130	58	137	54	208	40	194	82	--	--	--	--
24 July 1972	205	70	193	71	302	60	309	85	273	90	338	96
16 July 1973	193	19	133	17	207	10	271	17	--	--	--	--
					Early August							
7 Aug. 1969	134	--	170	--	166	--	--	--	--	--	--	--
3 Aug. 1970	132	28	147	22	169	32	150	48	131	53	142	41
9 Aug. 1971	124	43	122	65	190	49	212	105	--	--	--	--
7 Aug. 1972	256	50	224	59	311	44	355	70	264	65	282	38
					Late August							
28 Aug. 1969	98	--	118	--	136	--	--	--	--	--	--	--
17 Aug. 1970	158	79	96	28	112	18	133	40	82	21	117	19
24 Aug. 1971	121	56	98	58	194	43	208	30	--	--	--	--
21 Aug. 1972	188	49	327	85	317	78	202	153	282	73	247	49
21 Aug. 1973	104	9	122	18	169	16	131	8	--	--	--	--
					Early September							
4 Sept. 1969	81	--	78	--	147	--	--	--	--	--	--	--
1 Sept. 1970	97	43	77	27	137	47	93	36	108	23	52	19

Appendix Table [illegible]. Standing crop (g/m^2) of standing dead plants: 1969-1973. The mean ($\bar{X}$) and standard error (SE) are given. Data from May 1969 are summarized in Appendix Table 20.

Date	Treatment											
	4-ft site		8-ft site		Ungrazed				Grazed			
	1		1		1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
					Early June							
5 June 1969	--	--	--	--	--	--	--	--	--	--	--	--
8 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
15 June 1971	2	3	--	--	14	12	1	1	--	--	--	--
12 June 1972	6	6	4	7	18	15	11	9	28	18	15	13
					Late June							
18 June 1969	--	--	--	--	--	--	--	--	--	--	--	--
22 June 1970	4	6	--	--	37	13	35	18	11.	10	9	8
30 June 1971	1	1	1	1	4	5	4	2	--	--	--	--
26 June 1972	1	1	--	1	8	11	6	7	6	9	2	3
21 June 1973	13	3	--	--	66	10	1-2	43	--	--	--	--
					Early July							
6 July 1969	--	--	--	--	--	--	--	--	--	--	--	--
8 July 1970	1	2	1	2	9	10	5	4	4	4	2	2
13 July 1971	--	1	--	--	3	2	2	3	--	--	--	--
10 July 1972	1	1	2	2	22	23	17	17	9	13	6	4
					Late July							
20 July 1969	--	--	--	--	--	--	--	--	--	--	--	--
26 July 1970	--	--	--	--	3	5	8	9	2	4	2	7
27 July 1971	--	--	--	--	2	3	1	1	--	--	--	--
24 July 1972	3	4	2	5	14	7	11	7	6	5	11	12
16 July 1973	6	2	2	2	25	8	19	2	--	--	--	--
					Early August							
7 Aug. 1969	--	--	--	--	--	--	--	--	--	--	--	--
3 Aug. 1970	--	--	3	4	2	4	10	11	--	--	2	5
9 Aug. 1971	--	--	--	--	--	--	--	1	--	--	--	--
7 Aug. 1972	3	2	1	2	22	16	8	10	4	5	6	5
					Late August							
28 Aug. 1969	2	--	4	--	5	--	--	--	--	--	--	--
17 Aug. 1970	--	--	--	--	1	1	1	1	--	--	--	--
24 Aug. 1971	--	--	--	--	--	--	--	1	--	--	--	--
21 Aug. 1972	1	2	5	8	15	22	4	8	3	4	2	4
21 Aug. 1973	26	4	18	4	53	5	43	6	--	--	--	--
					Early September							
4 Sept. 1969	38	--	6	--	17	--	--	--	--	--	--	--
1 Sept. 1970	16	7	12	6	14	7	27	17	23	12	22	10

Appendix Table 3. Standing crop (g/m^2) of all live plants: 1969-1973. The mean ($\bar{X}$) and standard error (SE) are given. Data from 25 May 1969 are summarized in Appendix Table 20.

Date	Treatment											
	4-ft site		8-ft site		Ungrazed				Grazed			
	1		1		1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
					Early June							
5 June 1969	36		--	--	64		--	--	--	--	--	--
8 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
15 June 1971	25		--	--	68		30		--	--	--	--
12 June 1972	63		91		143		158		168		178	
					Late June							
18 June 1969	--	--	--	--	117		--	--	--	--	--	--
22 June 1970	60		--	--	47		79		74		76	
30 June 1971	57		23		87		118		--	--	--	--
26 June 1972	123		87		188		234		223		235	
21 June 1973	44	8	--	--	105	4	137	11	--	--	--	--
					Early July							
6 July 1969	108		96		157		--	--	--	--	--	--
8 July 1970	92		55		99		120		99		111	
13 July 1971	81		55		149		168		--	--	--	--
10 July 1972	166		153		260		304		273		290	
					Late July							
20 July 1969	82		170		161		--	--	--	--	--	--
26 July 1970	133		93		129		160		99		150	
27 July 1971	130		137		206		192		--	--	--	--
24 July 1972	202		191		288		298		267		326	
16 July 1973	188	18	131	17	183	9	252	17	--	--	--	--
					Early August							
7 Aug. 1969	134		170		166		--	--	--	--	--	--
3 Aug. 1970	132		145		167		140		130		140	
9 Aug. 1971	124		122		190		211		--	--	--	--
7 Aug. 1972	253		223		290		347		260		276	
					Late August							
28 Aug. 1969	95		114		131		--	--	--	--	--	--
17 Aug. 1970	157		96		106		131		79		117	
24 Aug. 1971	121		98		194		207		--	--	--	--
21 Aug. 1972	187		323		302		198		279		245	
21 Aug. 1973	78	10	104	15	116	11	87	8	--	--	--	--
					Early September							
4 Sept. 1969	43		71		130		--	--	--	--	--	--
1 Sept. 1970	81		66		122		65		78		28	

Appendix Table 4. Standing crop (g/m^2) of all grasses: 1969-1973. The mean ($\bar{X}$) and standard error (SE) are given. Data from 25 May 1969 are summarized in Appendix Table 20.

Date	Treatment											
	4-ft site		8-ft site		Ungrazed				Grazed			
	1		1		1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
					Early June							
5 June 1969	20		--	--	28		--	--	--	--	--	--
8 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
15 June 1971	8		--	--	51		17		--	--	--	--
12 June 1972	20		44		108		105		107		111	
					Late June							
18 June 1969	--	--	--	--	45		--	--	--	--	--	--
22 June 1970	18		--	--	29		42		42		36	
30 June 1971	14		9		59		68		--	--	--	--
26 June 1972	50		33		133		141		149		147	
21 June 1973	20		--	--	69		65		--	--	--	--
					Early July							
6 July 1969	44		36		73		--	--	--	--	--	--
8 July 1970	24		18		57		66		55		58	
13 July 1971	26		24		88		102		--	--	--	--
10 July 1972	71		51		175		195		165		187	
					Late July							
20 July 1969	39		69		97		--	--	--	--	--	--
26 July 1970	51		26		79		82		53		91	
27 July 1971	56		56		120		106		--	--	--	--
24 July 1972	81		60		195		176		173		220	
16 July 1973	69		34		123		140		--	--	--	--
					Early August							
7 Aug. 1969	61		64		113		--	--	--	--	--	--
3 Aug. 1970	55		52		101		73		91		83	
9 Aug. 1971	61		59		108		115		--	--	--	--
7 Aug. 1972	120		75		205		238		183		198	
					Late August							
28 Aug. 1969	55		56		97		--	--	--	--	--	--
17 Aug. 1970	63		47		64		94		61		81	
24 Aug. 1971	58		52		125		138		--	--	--	--
21 Aug. 1972	94		191		209		136		226		179	
21 Aug. 1973	36		40		49		35		--	--	--	--
					Early September							
4 Sept. 1969	25		34		88		--	--	--	--	--	--
1 Sept. 1970	47		35		72		49		60		26	

Appendix Table 5. Standing crop (g/m^2) of all forbs: 1969-1973. The mean ($\bar{X}$) and standard error (SE) are given. Data from 25 May 1969 are summarized in Appendix Table 20.

Date	Treatment											
	4-ft site		8-ft site		Ungrazed				Grazed			
	1		1		1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
					Early June							
5 June 1969	15		--		37		--	--	--	--	--	--
8 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
15 June 1971	14		16		17		12		--	--	--	--
12 June 1972	42		47		34		54		61		67	
					Late June							
18 June 1969	--	--	--	--	71		--	--	--	--	--	--
22 June 1970	42		--	--	19		37		35		40	
30 June 1971	42		43		33		50		--	--	--	--
26 June 1972	73		54		55		93		74		88	
21 June 1973	47		--	--	36		72		--	--	--	--
					Early July							
6 July 1969	64		60		84		--	--	--	--	--	--
8 July 1970	68		37		42		55		44		53	
13 July 1971	64		55		61		66		--	--	--	--
10 July 1972	95		102		85		109		109		103	
					Late July							
20 July 1969	43		101		64		--	--	--	--	--	--
26 July 1970	81		68		51		78		46		59	
27 July 1971	86		74		85		86		--	--	--	--
24 July 1972	121		131		93		122		94		107	
16 July 1973	119		97		59		112		--	--	--	--
					Early August							
7 Aug. 1969	73		106		53		--	--	--	--	--	--
3 Aug. 1970	77		92		67		67		39		57	
9 Aug. 1971	89		63		82		97		--	--	--	--
7 Aug. 1972	134		148		85		109		76		78	
					Late August							
28 Aug. 1969	40		57		34		--	--	--	--	--	--
17 Aug. 1970	94		49		42		37		18		36	
24 Aug. 1971	69		63		69		70		--	--	--	--
21 Aug. 1972	93		132		93		63		53		66	
21 Aug. 1973	42		63		68		52		--	--	--	--
					Early September							
4 Sept. 1969	18		37		42		--	--	--	--	--	--
1 Sept. 1970	35		30		50		16		18		3	

Appendix Table 6. Standing crop (g/m^2) of *Festuca idahoensis*: 1969-1973. The mean ($\bar{X}$) and standard error (SE) are given. Data from May 1969 are summarized in Appendix Table 20.

Date	Treatment											
	4-ft site		8-ft site		Ungrazed				Grazed			
	1		1		1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
					Early June							
5 June 1969	15	--	--	--	19	--	--	--	--	--	--	--
8 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
15 June 1971	4	5	--	--	30	22	8	6	--	--	--	--
12 June 1972	11	11	20	25	56	31	61	19	44	22	63	18
					Late June							
18 June 1969	--	--	--	--	35	--	--	--	--	--	--	--
22 June 1970	8	6	--	--	14	5	25	14	26	15	22	13
30 June 1971	10	6	4	5	19	9	39	18	--	--	--	--
26 June 1972	17	10	12	12	54	20	80	35	66	25	96	32
21 June 1973	8	3	0	0	33	4	26	4	--	--	--	--
					Early July							
5 July 1969	24	--	15	--	43	--	--	--	--	--	--	--
8 July 1970	12	7	9	12	26	14	30	14	22	11	33	18
13 July 1971	14	9	6	4	40	15	56	25	--	--	--	--
10 July 1972	32	21	15	13	96	29	110	31	75	28	112	69
					Late July							
24 July 1969	23	--	35	--	50	--	--	--	--	--	--	--
20 July 1970	26	9	7	7	35	16	33	13	25	8	44	19
27 July 1971	32	18	10	9	47	15	62	40	--	--	--	--
24 July 1972	39	32	17	23	116	40	110	32	88	45	137	42
16 July 1973	27	6	5	2	44	5	41	5	--	--	--	--
					Early August							
7 Aug. 1969	27	--	19	--	29	--	--	--	--	--	--	--
3 Aug. 1970	23	7	15	9	38	13	34	24	38	13	40	20
9 Aug. 1971	29	14	14	10	39	18	48	28	--	--	--	--
7 Aug. 1972	67	42	11	10	111	35	137	73	84	22	88	41
					Late August							
28 Aug. 1969	29	--	25	--	47	--	--	--	--	--	--	--
17 Aug. 1970	27	9	15	9	32	12	56	22	29	7	42	17
24 Aug. 1971	27	29	5	3	70	34	64	25	--	--	--	--
21 Aug. 1972	31	19	33	37	94	36	70	65	77	45	101	31
21 Aug. 1973	3	1	1	--	14	4	8	1	--	--	--	--
					Early September							
4 Sept. 1969	14	--	17	--	27	--	--	--	--	--	--	--
1 Sept. 1970	25	12	17	9	29	7	33	16	30	13	22	10

Appendix Table 7. Standing crop (g/m^2) of *Agropyron subsecundum*: 1969-1973. The mean ($\bar{X}$) and standard error (SE) are given. Data from May 1969 are summarized in Appendix Table 20.

Date	Treatment											
	4-ft site		8-ft site		Ungrazed				Grazed			
	1		1		1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
					Early June							
5 June 1969	5	--	--	--	5	--	--	--	--	--	--	--
8 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
15 June 1971	2	4	--	--	12	7	7	3	--	--	--	--
12 June 1972	7	8	21	29	49	46	41	22	45	20	35	18
					Late June							
18 June 1969	--	--	--	--	--	--	--	--	--	--	--	--
22 June 1970	5	5	--	--	9	4	10	5	5	3	4	3
30 June 1971	3	2	4	4	24	11	17	8	--	--	--	--
26 June 1972	23	32	16	15	47	21	36	17	41	14	17	13
					Early July							
6 July 1969	3	--	10	--	12	--	--	--	--	--	--	--
8 July 1970	5	6	5	3	22	13	24	16	14	17	3	4
13 July 1971	6	5	6	6	24	19	23	18	--	--	--	--
10 July 1972	19	23	30	32	41	14	44	35	39	52	16	11
					Late July							
20 July 1969	3	--	10	--	16	--	--	--	--	--	--	--
26 July 1970	5	5	10	8	21	8	24	34	5	12	11	18
27 July 1971	10	13	11	12	42	33	13	6	--	--	--	--
24 July 1972	18	22	33	32	41	26	24	16	28	25	37	46
					Early August							
7 Aug. 1969	3	--	16	--	50	--	--	--	--	--	--	--
3 Aug. 1970	7	8	13	9	32	20	18	15	15	34	9	9
9 Aug. 1971	18	18	30	28	35	38	41	62	--	--	--	--
7 Aug. 1972	10	10	48	57	42	12	51	58	29	42	23	37
					Late August							
28 Aug. 1969	6	--	13	--	27	--	--	--	--	--	--	--
17 Aug. 1970	15	20	25	15	20	20	26	31	11	17	6	12
24 Aug. 1971	19	41	34	43	36	48	46	30	--	--	--	--
21 Aug. 1972	47	55	138	62	71	46	30	26	68	35	20	25
					Early September							
4 Sept. 1969	2	--	10	--	32	--	--	--	--	--	--	--
1 Sept. 1970	8	13	14	7	30	27	10	8	12	12	2	3

Appendix Table 8. Standing crop (g/m^2) of *Carex* spp.: 1969-1973. The mean ($\bar{X}$) and standard error (SE) are given. Data from May 1969 are summarized in Appendix Table 20.

Date	Treatment											
	4-ft site		8-ft site		Ungrazed				Grazed			
	1		1		1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
					Early June							
5 June 1969	1	--	--	--	1	--	--	--	--	--	--	--
8 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
15 June 1971	--	--	--	--	2	3	--	--	--	--	--	--
12 June 1972	2	1	1	2	1	1	2	2	12	10	8	3
					Late June							
18 June 1969	--	--	--	--	5	--	--	--	--	--	--	--
22 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
30 June 1971	1	1	--	--	2	3	5	7	--	--	--	--
26 June 1972	5	6	2	3	4	3	7	7	20	18	12	8
					Early July							
6 July 1969	3	--	3	--	4	--	--	--	--	--	--	--
8 July 1970	--	--	--	--	--	--	--	--	--	--	--	--
13 July 1971	1	2	1	1	2	2	5	4	--	--	--	--
10 July 1972	7	4	2	2	6	4	11	10	26	14	20	12
					Late July							
20 July 1969	2	--	3	--	3	--	--	--	--	--	--	--
26 July 1970	--	--	--	--	--	--	--	--	--	--	--	--
27 July 1971	3	4	1	2	5	7	4	7	--	--	--	--
24 July 1972	6	4	3	3	6	5	12	4	22	14	16	8
					Early August							
7 Aug. 1969	8	--	11	--	7	--	--	--	--	--	--	--
3 Aug. 1970	--	--	--	--	--	--	--	--	--	--	--	--
9 Aug. 1971	4	4	1	1	4	4	10	10	--	--	--	--
7 Aug. 1972	12	8	2	3	7	6	14	8	29	18	23	16
					Late August							
25 Aug. 1969	5	--	6	--	7	--	--	--	--	--	--	--
28 Aug. 1970	--	--	--	--	--	--	--	--	--	--	--	--
17 Aug. 1971	3	3	1	1	7	11	1	2	--	--	--	--
24 Aug. 1972	5	4	3	4	14	10	9	10	36	15	17	8
					Early September							
4 Sept. 1969	5	--	5	--	3	--	--	--	--	--	--	--
1 Sept. 1970	--	--	--	--	--	--	--	--	--	--	--	--

Appendix Table 9. Standing crop (g/m^2) of *Danthonia intermedia*: 1969-1973. The mean ($\bar{X}$) and standard error (SE) are given. Data from May 1969 are summarized in Appendix Table 20.

Date	Treatment											
	4-ft site		8-ft site		Ungrazed				Grazed			
	1		1		1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
					Early June							
5 June 1969	--	--	--	--	2	--	--	--	--	--	--	--
8 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
15 June 1971	--	--	--	--	--	--	--	--	--	--	--	--
12 June 1972	1	1	2	2	2	2	1	--	7	8	5	5
					Late June							
18 June 1969	--	--	--	--	3	--	--	--	--	--	--	--
22 June 1970	1	1	--	--	1	1	2	2	2	3	2	2
30 June 1971	1	1	1	1	3	3	2	3	--	--	--	--
26 June 1972	4	2	2	3	6	5	7	7	11	7	12	8
					Early July							
6 July 1969	8	--	2	--	8	--	--	--	--	--	--	--
8 July 1970	3	3	1	1	3	6	2	3	6	10	7	4
13 July 1971	2	2	1	1	6	5	5	3	--	--	--	--
10 July 1972	6	5	1	1	7	5	14	10	19	11	14	10
					Late July							
20 July 1969	7	--	6	--	12	--	--	--	--	--	--	--
26 July 1970	9	5	1	1	3	3	7	5	8	6	13	8
27 July 1971	6	5	1	1	5	6	12	7	--	--	--	--
24 July 1972	5	2	1	1	10	7	17	8	20	9	16	9
					Early August							
7 Aug. 1969	14	--	5	--	5	--	--	--	--	--	--	--
3 Aug. 1970	10	8	6	7	7	9	8	6	15	7	12	7
9 Aug. 1971	3	5	2	2	5	4	6	5	--	--	--	--
7 Aug. 1972	12	11	1	1	8	7	12	5	27	10	16	11
					Late August							
28 Aug. 1969	6	--	4	--	8	--	--	--	--	--	--	--
17 Aug. 1970	5	3	3	3	4	3	2	3	8	5	18	9
24 Aug. 1971	2	2	--	1	7	8	9	8	--	--	--	--
21 Aug. 1972	4	3	2	2	8	6	9	9	25	16	23	11
					Early September							
4 Sept. 1969	3	--	2	--	5	--	--	--	--	--	--	--
1 Sept. 1970	4	2	1	1	4	2	1	1	11	6	1	2

Appendix Table 10. Standing crop (g/m^2) of *Koeleria cristata*: 1969-1973. The mean ($\bar{X}$) and standard error (SE) are given. Data from May 1969 are summarized in Appendix Table 20.

Date	Treatment											
	4-ft site		8-ft site		Ungrazed				Grazed			
	1		1		1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
					Early June							
5 June 1969	--	--	--	--	--	--	--	--	--	--	--	--
8 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
15 June 1971	--	--	--	--	--	--	--	--	--	--	--	--
12 June 1972	--	--	--	--	--	--	--	--	--	--	--	--
					Late June							
18 June 1969	--	--	--	--	3	--	--	--	--	--	--	--
22 June 1970	1	1	--	--	1	1	1	1	2	2	1	1
30 June 1971	--	--	--	--	--	--	--	--	--	--	--	--
26 June 1972	1	2	--	--	2	2	2	3	2	2	1	2
					Early July							
6 July 1969	2	--	1	--	6	--	--	--	--	--	--	--
8 July 1970	1	1	--	--	1	2	2	2	1	1	--	1
13 July 1971	--	--	--	--	--	--	--	--	--	--	--	--
10 July 1972	5	4	--	1	6	5	11	7	4	2	5	3
					Late July							
20 July 1969	5	--	7	--	15	--	--	--	--	--	--	--
26 July 1970	5	3	--	1	2	3	4	4	1	2	4	2
27 July 1971	--	--	--	--	--	--	--	--	--	--	--	--
24 July 1972	8	8	1	1	12	7	9	8	12	14	6	4
					Early August							
7 Aug. 1969	5	--	8	--	3	--	--	--	--	--	--	--
3 Aug. 1970	7	3	3	5	--	--	2	2	--	--	2	2
9 Aug. 1971	--	--	--	--	--	--	--	--	--	--	--	--
7 Aug. 1972	8	9	1	1	19	10	13	8	6	7	6	4
					Late August							
28 Aug. 1969	7	--	7	--	8	--	--	--	--	--	--	--
17 Aug. 1970	--	--	--	--	--	--	--	--	--	--	--	--
24 Aug. 1971	--	--	--	--	--	--	--	--	--	--	--	--
21 Aug. 1972	2	1	8	12	11	12	9	7	8	6	8	6
					Early September							
4 Sept. 1969	1	--	--	--	1	--	--	--	--	--	--	--
1 Sept. 1970	--	--	--	--	--	--	--	--	--	--	--	--

Appendix Table 11. Standing crop (g/m^2) of live miscellaneous grasses: 1969-1973. The mean ($\bar{X}$) and standard error (SE) are given. Data from 25 May 1969 are summarized in Appendix Table 20. Note that the composition of this category changes from year to year and even within a season: it includes all graminoids not presented under other headings. *Stipa richardsonii* data from 15 June, 9 August, and 24 August 1971 appear in Appendix Table 21.

Date	Treatment											
	4-ft site		8-ft site		Ungrazed				Grazed			
	1		1		1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
Early June												
5 June 1969	3	--	--	--	--	--	--	--	--	--	--	--
8 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
15 June 1971	2	2	--	--	7	5	1	2	--	--	--	--
12 June 1972	--	--	--	--	1	2	1	3	--	--	--	--
Late June												
18 June 1969	--	--	--	--	--	--	--	--	--	--	--	--
22 June 1970	4	3	--	--	4	3	4	3	6	6	8	7
30 June 1971	1	1	1	1	6	6	5	6	--	--	--	--
26 June 1972	--	1	--	1	22	17	8	12	9	10	10	9
21 June 1973	12	3	--	--	36	5	39	6	--	--	--	--
Early July												
6 July 1969	3	--	4	--	--	--	--	--	--	--	--	--
8 July 1970	4	4	3	4	4	4	7	5	12	6	15	11
13 July 1971	3	3	10	13	16	10	12	7	--	--	--	--
10 July 1972	3	3	2	4	19	18	5	7	1	2	19	15
Late July												
20 July 1969	--	--	9	--	2	--	--	--	--	--	--	--
26 July 1970	7	3	6	11	17	17	13	9	14	10	19	6
27 July 1971	6	7	32	33	22	12	15	12	--	--	--	--
24 July 1972	5	8	6	5	11	8	5	9	4	6	8	8
16 July 1973	42	7	29	8	79	9	98	10	--	--	--	--
Early August												
7 Aug. 1969	4	--	5	--	18	--	--	--	--	--	--	--
3 Aug. 1970	8	4	15	5	25	9	12	12	24	13	20	15
9 Aug. 1971	4	2	8	7	19	19	8	8	--	--	--	--
7 Aug. 1972	10	8	11	13	17	15	11	11	7	5	42	35
Late August												
28 Aug. 1969	1	--	1	--	1	--	--	--	--	--	--	--
17 Aug. 1970	17	9	4	3	8	7	10	8	13	11	15	5
24 Aug. 1971	4	8	11	14	2	3	10	13	--	--	--	--
21 Aug. 1972	4	7	8	8	12	14	9	16	12	11	10	10
21 Aug. 1973	33	10	39	8	35	7	27	6	--	--	--	--
Early September												
4 Sept. 1969	--	--	--	--	21	--	--	--	--	--	--	--
1 Sept. 1970	10	7	4	5	9	5	5	5	7	8	1	2

Appendix Table 12. Standing crop (g/m^2) of *Lupinus argenteus*: 1969-1973. The mean ($\bar{X}$) and standard error (SE) are given. Data from May 1969 are summarized in Appendix Table 20.

Date	Treatment											
	4-ft site		8-ft site		Ungrazed				Grazed			
	1		1		1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
Early June												
5 June 1969	3	--	--	--	6	--	--	--	--	--	--	--
8 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
15 June 1971	1	2	--	--	--	1	--	--	--	--	--	--
12 June 1972	7	8	5	6	1	1	12	7	10	6	14	14
Late June												
18 June 1969	--	--	--	--	7	--	--	--	--	--	--	--
22 June 1970	6	4	--	--	3	3	6	5	8	9	10	10
30 June 1971	20	20	2	3	9	10	17	12	--	--	--	--
26 June 1972	12	10	14	24	6	3	20	17	8	10	26	18
21 June 1973	3	1	--	--	2	1	14	3				
Early July												
6 July 1969	22	--	23	--	31	--	--	--	--	--	--	--
8 July 1970	18	11	15	13	12	9	16	12	11	12	18	10
13 July 1971	23	26	9	5	14	6	26	20	--	--	--	--
10 July 1972	16	11	28	23	17	12	37	32	24	30	38	39
Late July												
20 July 1969	7	--	31	--	5	--	--	--	--	--	--	--
26 July 1970	22	27	29	14	20	16	17	17	15	14	24	21
27 July 1971	11	11	32	26	34	30	50	38	--	--	--	--
24 July 1972	16	8	18	12	18	16	40	34	22	22	44	51
16 July 1973	27	7	20	5	13	3	42	10	--	--	--	--
Early August												
7 Aug. 1969	15	--	43	--	17	--	--	--	--	--	--	--
3 Aug. 1970	21	14	21	14	21	21	27	32	8	10	26	21
9 Aug. 1971	22	18	25	19	35	18	51	37	--	--	--	--
7 Aug. 1972	27	20	31	23	25	20	33	29	19	21	26	33
Late August												
28 Aug. 1969	4	--	17	--	8	--	--	--	--	--	--	--
17 Aug. 1970	47	64	23	17	19	15	7	6	8	11	11	9
24 Aug. 1971	32	30	20	19	18	21	29	19	--	--	--	--
21 Aug. 1972	21	15	32	26	31	22	16	17	7	8	17	19
21 Aug. 1973	9	3	18	7	38	8	12	4	--	--	--	--
Early September												
4 Sept. 1969	1	--	4	--	8	--	--	--	--	--	--	--
1 Sept. 1970	12	13	13	16	23	22	4	8	--	--	--	--

Appendix Table 13. Standing crop (g/m^2) of *Arenaria congesta*: 1969-1973. The mean ($\bar{X}$) and standard error (SE) are given. Data from May 1969 are summarized in Appendix Table 20.

Date	Treatment											
	4-ft site		8-ft site		Ungrazed				Grazed			
	1		1		1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
Early June												
5 June 1969	2	--	--	--	3	--	--	--	--	--	--	--
8 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
15 June 1971	1	2	--	--	3	4	2	2	--	--	--	--
12 June 1972	3	3	5	7	7	8	6	3	8	4	11	3
Late June												
18 June 1969	--	--	--	--	8	--	--	--	--	--	--	--
22 June 1970	2	3	--	--	1	1	4	3	2	1	3	3
30 June 1971	1	1	1	1	3	2	4	4	--	--	--	--
26 June 1972	9	7	3	5	10	6	20	23	11	10	10	7
Early July												
6 July 1969	6	--	3	--	6	--	--	--	--	--	--	--
8 July 1970	3	3	3	4	2	2	3	4	3	2	5	4
13 July 1971	3	3	2	2	5	4	7	5	--	--	--	--
10 July 1972	7	5	2	3	19	15	20	16	11	4	16	11
Late July												
20 July 1969	4	--	10	--	11	--	--	--	--	--	--	--
26 July 1970	8	8	4	3	3	5	7	6	3	3	5	4
27 July 1971	6	4	5	7	4	2	9	6	--	--	--	--
24 July 1972	7	5	5	5	13	8	21	21	20	15	11	11
Early August												
7 Aug. 1969	6	--	10	--	2	--	--	--	--	--	--	--
3 Aug. 1970	9	5	5	3	5	6	3	3	1	2	2	2
9 Aug. 1971	4	4	5	7	6	5	7	8	--	--	--	--
7 Aug. 1972	15	9	3	5	9	6	14	10	15	6	10	5
Late August												
28 Aug. 1969	2	--	5	--	4	--	--	--	--	--	--	--
17 Aug. 1970	4	1	3	3	2	3	3	1	1	2	3	1
24 Aug. 1971	5	6	2	3	7	4	6	6	--	--	--	--
21 Aug. 1972	5	3	8	8	13	11	12	17	12	12	9	12
Early September												
4 Sept. 1969	7	--	7	--	14	--	--	--	--	--	--	--
1 Sept. 1970	3	3	2	1	2	2	2	1	3	2	1	1

Appendix Table 14. Standing crop (g/m^2) of *Achillea millefolia*: 1969-1973. The mean ($\bar{X}$) and standard error (SE) are given. Data from May 1969 are summarized in Appendix Table 20.

Date	Treatment											
	4-ft site		8-ft site		Ungrazed				Grazed			
	1		1		1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
					Early June							
5 June 1969	1	--	--	--	1	--	--	--	--	--	--	--
8 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
15 June 1971	1	1	--	--	1	1	1	1	--	--	--	--
12 June 1972	1	2	4	5	2	1	1	1	4	3	2	1
					Late June							
18 June 1969	--	--	--	--	4	--	--	--	--	--	--	--
22 June 1970	5	4	--	--	1	1	1	1	1	1	1	1
30 June 1971	2	2	--	--	2	2	2	2	--	--	--	--
26 June 1972	3	2	3	3	3	2	4	2	6	5	3	2
					Early July							
6 July 1969	4	--	5	--	5	--	--	--	--	--	--	--
8 July 1970	4	2	2	2	1	2	4	5	3	2	3	2
13 July 1971	3	2	1	1	3	3	3	4	--	--	--	--
10 July 1972	6	5	8	12	2	1	5	3	9	6	3	3
					Late July							
20 July 1969	11	--	12	--	4	--	--	--	--	--	--	--
26 July 1970	7	2	3	4	2	1	3	3	4	3	6	3
27 July 1971	10	12	5	7	2	2	2	2	--	--	--	--
24 July 1972	7	6	18	39	6	4	6	5	9	7	4	3
					Early August							
7 Aug. 1969	11	--	9	--	4	--	--	--	--	--	--	--
3 Aug. 1970	7	4	9	8	3	4	2	2	4	4	5	4
9 Aug. 1971	5	4	5	5	2	37	2	1	--	--	--	--
7 Aug. 1972	13	17	10	13	7	7	7	6	8	8	6	4
					Late August							
28 Aug. 1969	9	--	5	--	2	--	--	--	--	--	--	--
17 Aug. 1970	11	11	5	4	1	1	2	1	2	2	3	2
24 Aug. 1971	7	6	2	2	2	2	4	3	--	--	--	--
21 Aug. 1972	6	6	24	19	5	5	6	6	7	8	3	2
					Early September							
4 Sept. 1969	1	--	4	--	3	--	--	--	--	--	--	--
1 Sept. 1970	4	3	5	5	2	2	1	1	4	3	1	1

Appendix Table 15. Standing crop (g/m^2) of *Agoseris* species: 1969-1973. The mean ($\bar{X}$) and standard error (SE) are given. Data from May 1969 are summarized in Appendix Table 20.

Date	Treatment											
	4-ft site		8-ft site		Ungrazed				Grazed			
	1		1		1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
Early June												
5 June 1969	2	--	--	--	2	--	--	--	--	--	--	--
8 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
15 June 1971	--	--	--	--	2	4	1	2	--	--	--	--
12 June 1972	2	5	4	8	--	1	2	3	1	1	3	6
Late June												
18 June 1969	--	--	--	--	3	--	--	--	--	--	--	--
22 June 1970	--	1	--	--	1	1	1	1	1	1	1	1
30 June 1971	5	6	1	1	4	6	3	5	--	--	--	--
26 June 1972	4	7	3	4	7	8	3	6	--	--	4	6
Early July												
6 July 1969	3	--	5	--	6	--	--	--	--	--	--	--
8 July 1970	2	3	1	2	1	1	--	--	--	--	3	3
13 July 1971	11	15	2	3	5	7	5	8	--	--	--	--
10 July 1972	13	16	9	15	4	4	7	11	--	1	3	4
Late July												
20 July 1969	5	--	13	--	3	--	--	--	--	--	--	--
26 July 1970	5	8	4	9	2	2	1	4	--	--	1	1
27 July 1971	8	10	7	9	9	12	3	8	--	--	--	--
24 July 1972	25	29	10	7	11	16	5	7	--	1	4	5
Early August												
7 Aug. 1969	7	--	12	--	2	--	--	--	--	--	--	--
3 Aug. 1970	2	3	7	7	4	10	2	4	--	--	2	3
9 Aug. 1971	3	4	6	8	5	9	2	3	--	--	--	--
7 Aug. 1972	11	13	15	25	10	10	9	18	--	--	3	4
Late August												
28 Aug. 1969	6	--	4	--	3	--	--	--	--	--	--	--
17 Aug. 1970	2	3	5	8	1	2	2	3	--	--	3	3
24 Aug. 1971	3	7	2	4	4	10	5	8	--	--	--	--
21 Aug. 1972	9	13	11	12	3	6	2	6	--	1	6	6
Early September												
4 Sept. 1969	--	--	2	--	2	--	--	--	--	--	--	--
1 Sept. 1970	1	1	1	8	2	2	--	1	1	4	--	1

Appendix Table 16. Standing crop (g/m^2) of *Erigeron speciosus*: 1969-1973. The mean ($\bar{X}$) and standard error (SE) are given. Data from May 1969 are summarized in Appendix Table 20.

Date	Treatment											
	4-ft site		8-ft site		Ungrazed				Grazed			
	1		1		1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
					Early June							
5 June 1969	--	--	--	--	1	--	--	--	--	--	--	--
8 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
15 June 1971	--	--	--	--	--	--	--	--	--	--	--	--
12 June 1972	3	6	1	1	3	1	2	2	3	5	--	1
					Late June							
18 June 1969	--	--	--	--	2	--	--	--	--	--	--	--
22 June 1970	--	1	--	--	1	1	--	1	--	--	1	2
30 June 1971	--	--	--	--	--	--	--	--	--	--	--	--
26 June 1972	1	3	--	--	1	2	1	1	--	--	--	--
					Early July							
6 July 1969	1	--	--	--	6	--	--	--	--	--	--	--
8 July 1970	3	10	1	4	3	6	1	3	--	--	--	--
13 July 1971	--	--	--	--	1	2	3	6	--	--	--	--
10 July 1972	1	3	--	1	9	8	4	4	--	--	--	--
					Late July							
20 July 1969	2	--	6	--	15	--	--	--	--	--	--	--
26 July 1970	3	6	--	--	--	--	6	8	1	3	--	--
27 July 1971	5	12	9	17	10	9	5	5	--	--	--	--
24 July 1972	3	9	10	19	6	7	4	10	--	--	--	--
					Early August							
7 Aug. 1969	12	--	8	--	9	--	--	--	--	--	--	--
3 Aug. 1970	5	7	7	9	6	6	4	5	--	--	--	2
9 Aug. 1971	4	6	4	6	6	8	9	11	--	--	--	--
7 Aug. 1972	8	18	2	3	4	5	5	5	1	2	--	--
					Late August							
28 Aug. 1969	--	--	5	--	9	--	--	--	--	--	--	--
17 Aug. 1970	--	--	--	--	--	--	--	--	--	--	--	--
24 Aug. 1971	3	7	3	6	16	27	12	10	--	--	--	--
21 Aug. 1972	8	16	19	23	8	9	3	5	--	--	--	--
					Early September							
4 Sept. 1969	--	--	--	--	1	--	--	--	--	--	--	--
1 Sept. 1970	--	--	--	--	--	--	--	--	--	--	--	--

Appendix Table 17. Standing crop (g/m^2) of *Cerastium arvensis*: 1969-1973. The mean ($\bar{X}$) and standard error (SE) are given. Data from May 1969 are summarized in Appendix Table 20.

Date	Treatment											
	4-ft site		8-ft site		Ungrazed				Grazed			
	1		1		1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
					Early June							
5 June 1969	--	--	--	--	2	--	--	--	--	--	--	--
8 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
15 June 1971	--	--	--	--	1	1	--	1	--	--	--	--
12 June 1972	--	--	1	3	2	3	1	1	--	--	3	5
					Late June							
18 June 1969	--	--	--	--	3	--	--	--	--	--	--	--
22 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
30 June 1971	--	--	--	--	2	2	1	2	--	--	--	--
26 June 1972	1	2	--	1	4	2	5	4	2	1	6	4
					Early July							
6 July 1969	2	--	3	--	5	--	--	--	--	--	--	--
8 June 1970	1	2	--	--	3	4	1	1	1	1	2	7
13 July 1971	1	1	--	--	4	2	3	2	--	--	--	--
10 July 1972	2	2	--	1	6	5	4	3	5	3	9	7
					Late July							
20 July 1969	1	--	4	--	14	--	--	--	--	--	--	--
26 July 1970	2	2	--	--	3	3	5	4	2	2	6	4
27 July 1971	1	1	--	1	6	4	2	3	--	--	--	--
24 July 1972	2	2	--	1	8	6	5	4	9	7	6	5
					Early August							
7 Aug. 1969	5	--	4	--	16	--	--	--	--	--	--	--
3 Aug. 1970	3	2	1	1	--	--	4	5	--	--	5	4
9 Aug. 1971	1	1	1	2	2	3	5	9	--	--	--	--
7 Aug. 1972	3	2	--	1	10	8	9	6	8	8	9	5
					Late August							
28 Aug. 1969	7	--	6	--	6	--	--	--	--	--	--	--
17 Aug. 1970	--	--	--	--	--	--	--	--	--	--	--	--
24 Aug. 1971	--	--	--	--	2	2	2	2	--	--	--	--
21 Aug. 1972	7	10	3	5	13	11	4	3	5	4	11	12
					Early September							
4 Sept. 1969	--	--	2	--	3	--	--	--	--	--	--	--
1 Sept. 1970	--	--	--	--	--	--	--	--	--	--	--	--

Appendix Table 18. Standing crop (g/m^2) of *Galium boreale*: 1969-1973. The mean ($\bar{X}$) and standard error (SE) are given. Data from May 1969 are summarized in Appendix Table 20.

Date	Treatment											
	4-ft site		8-ft site		Ungrazed				Grazed			
	1		1		1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
					Early June							
5 June 1969	--	--	--	--	2	--	--	--	--	--	--	--
8 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
15 June 1971	--	--	--	--	--	--	--	--	--	--	--	--
12 June 1972	2	3	3	3	1	2	3	4	--	--	--	--
					Late June							
18 June 1969	--	--	--	--	2	--	--	--	--	--	--	--
22 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
30 June 1971	1	2	1	3	2	3	3	6	--	--	--	--
26 June 1972	3	4	6	11	3	5	4	7	1	2	2	4
					Early July							
6 July 1969	4	--	--	--	1	--	--	--	--	--	--	--
8 July 1970	--	--	--	--	--	--	--	--	--	--	--	--
13 July 1971	2	3	5	5	5	6	5	5	--	--	--	--
10 July 1972	16	33	9	10	6	6	7	11	2	3	2	4
					Late July							
20 July 1969	5	--	9	--	4	--	--	--	--	--	--	--
26 July 1970	--	--	--	--	--	--	--	--	--	--	--	--
27 July 1971	14	12	6	7	8	13	2	3	--	--	--	--
24 July 1972	12	17	9	13	8	12	5	6	3	5	2	5
					Early August							
7 Aug. 1969	4	--	7	--	--	--	--	--	--	--	--	--
3 Aug. 1970	--	--	--	--	6	13	--	--	6	8	--	--
9 Aug. 1971	11	13	7	9	4	9	11	19	--	--	--	--
7 Aug. 1972	6	10	14	14	3	5	5	5	1	2	--	--
					Late August							
28 Aug. 1969	6	--	4	--	1	--	--	--	--	--	--	--
17 Aug. 1970	5	9	4	4	3	4	7	8	--	1	2	3
24 Aug. 1971	5	8	12	14	8	7	3	5	--	--	--	--
21 Aug. 1972	6	11	9	11	5	6	7	13	1	3	3	6
					Early September							
4 Sept. 1969	1	--	4	--	--	--	--	--	--	--	--	--
1 Sept. 1970	--	--	--	--	--	--	--	--	--	--	--	--

Appendix Table 19. Standing crop (g/m^2) of live miscellaneous forbs: 1969-1973. The mean ($\bar{X}$) and standard error (SE) are given. Data from 25 May 1969 are summarized in Appendix Table 20. Note that the composition of this category changes from year to year and even within a season: it includes all forbs not included in other categories.

Date	Treatment											
	4-ft site		8-ft site		Ungrazed				Grazed			
	1		1		1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
					Early June							
5 June 1969	8	--	--	--	20	--	--	--	--	--	--	--
8 June 1970	--	--	--	--	--	--	--	--	--	--	--	--
15 June 1971	13	9	--	--	10	3	7	4	--	--	--	--
12 June 1972	24	15	25	25	18	12	26	20	34	5	35	15
					Late June							
18 June 1969	--	--	--	--	21	--	--	--	--	--	--	--
22 June 1970	28	18	--	--	13	3	24	8	24	15	24	14
30 June 1971	14	7	8	6	13	5	19	14	--	--	--	--
26 June 1972	40	27	24	15	21	7	37	23	47	27	37	15
21 June 1973	44	8	--	--	33	4	58	7	--	--	--	--
					Early July							
6 July 1969	20	--	20	--	23	--	--	--	--	--	--	--
8 July 1970	37	19	15	9	21	12	30	20	26	10	21	7
13 July 1971	11	7	13	6	24	7	15	7	--	--	--	--
10 July 1972	33	23	45	30	22	9	24	15	56	27	32	17
					Late July							
20 July 1969	8	--	15	--	8	--	--	--	--	--	--	--
26 July 1970	35	28	29	20	20	7	38	12	20	12	18	9
27 July 1971	19	17	17	16	11	6	14	12	--	--	--	--
24 July 1972	49	28	61	26	24	8	35	21	31	13	35	27
15 July 1973	10	11	77	16	47	7	70	7	--	--	--	--
					Early August							
7 Aug. 1969	12	--	12	--	4	--	--	--	--	--	--	--
3 Aug. 1970	29	7	43	35	22	14	25	15	20	11	16	10
9 Aug. 1971	13	10	9	7	7	11	10	12	--	--	--	--
7 Aug. 1972	51	38	71	43	17	8	28	21	24	8	23	14
					Late August							
28 Aug. 1969	6	--	12	--	10	--	--	--	--	--	--	--
17 Aug. 1970	25	18	8	3	15	9	17	12	6	4	14	17
24 Aug. 1971	9	7	4	3	12	12	9	5	--	--	--	--
21 Aug. 1972	32	31	26	24	14	11	13	10	20	9	17	14
21 Aug. 1973	33	4	45	12	30	4	40	5	--	--	--	--
					Early September							
4 Sept. 1969	7	--	14	--	12	--	--	--	--	--	--	--
1 Sept. 1970	16	11	10	6	20	13	8	9	11	7	1	1

Appendix Table 20. Standing crops (g/m^2) of various herb categories, Bridger Site, 25 May 1969. Total live material at that time was 45.61 g/m^2.

Graminoids	Biomass (g/m^2)	Forbs	Biomass (g/m^2)
Agropyron subsecundum	1.39	*Achillea millefolium*	0.78
Carex spp.		*Agoseris* spp.	1.18
Danthonia intermedia	0.12	*Arenaria congesta*	0.71
Festuca idahoensis	26.78	*Cerastium arvensis*	1.80
Koeleria cristata	0.73	*Erigeron speciosus*	2.01
Miscellaneous grasses	0.76	*Galium boreale*	0.10
Total grasses	10.24	*Lupinus argenteus*	1.24
		Miscellaneous forbs	7.55
		Total forbs	15.37

Appendix Table 21. Standing crop (g/m^2) of *Stipa richardsonii* at the Bridger Site on 15 June, 9 August, and 24 August 1971. The mean ($\bar{X}$) and standard error (SE) are given.

Date	Treatment							
	4-ft site		8-ft site		Ungrazed--normal snow			
	1		2		1		2	
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE
15 June 1971	--	--	--	--	1	2	1	1
9 August 1971	4	6	4	5	7	6	3	4
24 August 1971	2	6	1	2	3	4	9	7

Appendix Table 22. Quantities of fungi (meters of hyphae/g dry soil) and bacteria (millions/g dry soil) in an alpine grassland dominated by *Bromus*, *Poa*, and *Elymus* on Mt. Allen, Alberta. Unpublished data of Bissett and Parkinson, University of Calgary, Alberta, Canada.

Depth	Fungi	Bacteria		
	May	2 June	17 July	4 September
0-2 cm	580	98	41	56
5-8 cm	224	37	38	29
15-18 cm	190	33	21	20

Appendix Table 23. Numbers of nematodes per m^2 at the Bridger Site on 2 October 1972. Unpublished data of J. Smolik, Plant Science Department, South Dakota State University, Brookings.

Depth	Grazed			Ungrazed		
	Plant Feeding	Predaceous	Saprophytes	Plant Feeding	Predaceous	Saprophytes
0-5	757,400	90,100	1,439,500	967,800	86,700	1,062,000
5-10	617,600	103,900	667,000	873,600	94,400	979,000
10-20	820,000	180,800	720,000	1,018,200	157,800	703,000
20-30	427,200	116,800	572,000	897,200	130,800	497,000
30-40	337,200	113,800	543,000	510,600	86,400	394,000
40-50	213,800	74,200	384,000	364,800	74,200	378,000
Total	3,173,200	679,600	4,325,500	4,632,200	630,300	4,013,000

Appendix Table 24. A list of insects identified to species at the Bridger Site in 1972.

Order	Family	Genus and species	Namer
Coleoptera	Anthicidae	*Anthicus* sp.	
	Carabidae	*Microlestes nigriuns*	Mann
Hemiptera	Pentatomidae	*Chlorochroa* sp.	
Diptera	Chloropidae	*Meromyza pratorum*	Meigen
Hymenoptera	Formicidae	*Myrmica americana?*	
	Formicidae	*Formica neogagates?*	
	Formicidae	*Tapinoma sissile*	Say
	Formicidae	*Formica obscuri*	Forel
	Formicidae	*Leptothorax rugulatus*	Emery
	Formicidae	*Solenopsis molesta*	Say
	Formicidae	*Lasius umbratus?*	
	Formicidae	*Leptothorax tricarinatus*	Emery
Homoptera	Cicadellidae	*Athysanella bifide*	Ball and Beamer
	Cicadellidae	*Aceratagallia fuscoscripta*	Oman
	Cicadellidae	*Dikraneura carneola*	(Stal)
	Cicadellidae	*Endria inimica*	(Say)
	Cicadellidae	*Commellus sexvittatus*	(Van Duzee)
	Cicadellidae	*Cabrulus labeculus*	(De Long)
	Cicadellidae	*Empoasca decora?*	
	Cicadellidae	*Auridius auratus?*	
	Cicadellidae	*Aphelonema rugosa*	Ball
	Cicadellidae	*Paraphlepsius lascivius*	Ball
	Cicadellidae	*Chlorolettin unicolor*	Fitch
Orthoptera	Acrididae	*Melanoplus oregonesis*	Thomas
	Acrididae	*Melanoplus bruneri*	Scudder
	Acrididae	*Melanoplus alpinus*	Scudder
	Acrididae	*Melanoplus dawsoni?*	(Scudder)
	Acrididae	*Camnula pellucida*	Scudder

'ppendix Table 25. Average weights of important insect species in grams.

Order	Family	Genus and species	Code	Insects (No.)	Average weight (g)
Coleoptera	Curculionidae		Co 317	15	0.0004
Coleoptera	Chrysomelidae		Co 89	6	0.0003
Coleoptera	Anthicidae		Co 133	9	0.0003
Diptera	Tabanidae		Di 125	1	0.0197
Hemiptera	Pentatomidae	*Chlorochroa* sp.	He 02	3	0.0450
Hemiptera	Miridae		He 57	26	0.0012
Hemiptera	Coreidae		He 22	18	0.0009
Hemiptera	Coreidae		He 80	18	0.0009
Hemiptera	Nabidae		He 50	6	0.0020
Homoptera	Chermidae		Ho 36	7	0.0004
Homoptera	Cicadellidae	*Aceratagallia fuscoscripta*	Ho 148	16	0.0004
Homoptera	Cicadellidae	*Empoasca decora*?	Ho 74	9	0.0004
Homoptera	Cicadellidae	*Dikraneura carneola*	Ho 110	7	0.0002
''ymenoptera	Formicidae	*Myrmica americana*?	Hy 30	14	0.0006
.ymenoptera	Formicidae	*Formica neogagates*?	Hy 36	12	0.0003
Lepidoptera	Cosmetperygidae		Le 56	11	0.0007
Orthoptera	Locustidae	*Melanoplus oregonensis*	Or 05[a/]	4	0.0626
Orthoptera	Locustidae	*Melanoplus oregonensis*	Or 05[b/]	5	0.1216

[a/] Male

[b/] Female

Appendix Table 26. Physical description of sites.

Sites	Years trapped	Grazing treatment	Location	Aspect	Slope	Altitude
1-IBP	1970, 1971 1972, 1973	Sheep	SE 1/4, Sec. 36, R. 7E, T. 1N	SE	2 deg	2340 m
2	1970, 1971	Sheep	NE 1/4, Sec. 75, R. 7E, T. 1N	E	8 deg	2250 m
3	1970, 1971	Cattle	NW 1/4, Sec. 8, R. 8E, T. 1S	NW	5 deg	2360 m
4	1971	Cattle	NE 1/4, Sec. 7, R. 8E, T. 1S	E	12 deg	2340 m
5-IBP	1970, 1972 1973	None	NE 1/4, Sec. 6, R. 8E, T. 1S	S	2-9 deg	2345 m

Appendix Table 27. Bridger Site small mammal trapping dates: 1970-1973.

Grid	Date	Live trapping-10	Assessment lines-17	Snap trapping-11	Traps per station	Mound count
1	15-26 July 1970			x	2	x
	12-17 June 1971	x			1	
	4-9 July 1971	x			1	
	6-11 Aug 1971	x			1	x
	31 Aug-5 Sept 1971	x			1	
	5-9 July 1972	x			2	
	10-14 July 1972		x		1	
	1-5 Aug 1972	x			2	
	6-10 Aug 1972		x		1	
	16-20 Aug 1972	x			2	
	21-25 Aug 1972		x		1	
	6-10 Aug 1973	x			1	
2	14-14 July 1970	x			1	
	10-15 Aug 1970	x			1	
	7-12 Sept 1970	x			1	
	19-24 June 1971	x			1	
	10-15 July 1971	x			1	
	12-17 Aug 1971	x			1	x
	6-11 Sept 1971	x			1	
3	21-26 July 1970	x			1	
	15-20 Aug 1970	x			1	
	13-18 Sept 1970	x			1	
	12-17 June 1971	x			1	
	4-9 July 1971	x			1	
	6-11 Aug 1971	x			1	
	31 Aug-5 Sept 1971	x			1	
4	19-24 June 1971	x			1	
	10-15 July 1971	x			1	
	12-17 Aug 1971	x			1	x
	6-11 Sept 1971	x			1	
	17-28 July 1970	x			2	x
	Sept 1970					x
5	12-16 July 1972	x			2	
	17-21 July 1972		x		1	
	6-10 Aug 1972	x			2	
	11-15 Aug 1972		x		1	
	21-25 Aug 1972	x			2	
	26-30 Aug 1972		x		1	
	6-10 Aug 1973	x			1	

APPENDIX II

FIELD DATA

Aboveground Plant Biomass

The aboveground herbage data for the Bridger Site in 1970 are Grassland Biome data set A2U0003 and for 1972 are data set A2U00E3. The data are recorded on Form NREL-01; a data form and a sample listing of the 1972 data follow.

IBP

GRASSLAND BIOME

U.S. INTERNATIONAL BIOLOGICAL PROGRAM

FIELD DATA SHEET - ABOVEGROUND BIOMASS

DATA TYPE	SITE	INITIALS	DATE DAY	DATE MO.	DATE YR.	TREATMENT	REPLICATE	PLOT SIZE	QUADRAT	CLIP-EST.	GROWTH FM.	GENUS	SPECIES	SUBSPECIES	CATEGORY	WEIGHT ESTIMATE	SACK NO.	DRY WEIGHT	CROWN PLOT SIZE	CROWN WEIGHT
1-2	3-4	5-7	8-9	10-11	12-13	14	15	16-19	21-23	25	27	29-30	31-32	34	35	36-40	42-45	47-52	54-57	59-64
01																				

DATA TYPE
01 Aboveground Biomass
02 Litter
03 Belowground Biomass
10 Vertebrate - Live Trapping
11 Vertebrate - Snap Trapping
12 Vertebrate - Collection
20 Avian Flush Census
21 Avian Road Count
22 Avian Road Count Summary
23 Avian Collection - Internal
24 Avian Collection - External
25 Avian Collection - Plumage
30 Invertebrate
40 Microbiology - Decomposition
41 Microbiology - Nitrogen
42 Microbiology - Biomass
43 Microbiology - Root Decomposition
44 Microbiology - Respiration

SITE
01 Ale
02 Bison
03 Bridger
04 Cottonwood
05 Dickinson
06 Hays
07 Hopland
08 Jornada
09 Osage
10 Pantex
11 Pawnee

CLIP-ESTIMATE
1 Harvested
2 Harvest and Est.
3 Estimated
4 Est. for Insect
5 Est. for Reference
6 Est. for Future Clip

GROWTH FORM
1 Perennial grass
2 Annual grass
3 Sedge, rush, etc.
4 Annual forb
5 Biennial forb
6 Perennial forb
7 Half-shrub
8 Shrub
9 Tree
0 Miscellaneous

TREATMENT
1 Ungrazed
2 Lightly grazed
3 Moderately grazed
4 Heavily grazed
5 Grazed 1969, ungrazed 1970
6 Grazed 1970, ungrazed 1971
7
8
9

CATEGORY
1 Live
2 Old dead
3 Recent dead

+++ EXAMPLE OF DATA +++

```
         1         2         3         4         5         6         7
1234567890123456789012345678901234567890123456789012345678901234567890123

1 3DDC120672110.50 001 1 0 MIGR  1                35.11                  1
1 3DDC120672110.50 001 1 6 CEAR 41                00.48                  1
1 3DDC120672110.50 001 1 1 FEID  3                00.59                  1
1 3DDC120672110.50 001 1 6 ERSP 41                01.30                  1
1 3DDC120672110.50 001 1 1 AGSU  3                05.40                  1
1 3DDC120672110.50 001 1 1 AGSU  1                07.65                  1
1 3DDC120672110.50 001 1 0 MIOT  2                25.26                  1
1 3DDC120672110.50 001 1 6 LUAR 31                00.46                  1
1 3DDC120672110.50 001 1 0 MIFO  1                03.60                  1
1 3DDC120672110.50 001 1 1 FEID  1                00.65                  1
1 3DDC120672110.50 002 1 1 FEID  1                29.50                  1
1 3DDC120672110.50 002 1 1 FEID  3                06.45                  1
1 3DDC120672110.50 002 1 0 MIOT  2                01.26                  1
1 3DDC120672110.50 002 1 6 CEAR 41                01.00                  1
1 3DDC120672110.50 002 1 1 AGSU  1                12.06                  1
1 3DDC120672110.50 002 1 1 AGSU  3                01.42                  1
1 3DDC120672110.50 002 1 6 LUAR 31                01.03                  1
1 3DDC120672110.50 002 1 6 ERSP 41                01.52                  1
1 3DDC120672110.50 002 1 6 ACMI 21                00.60                  1
1 3DDC120672110.50 002 1 6 ARCO 51                04.26                  1
1 3DDC120672110.50 002 1 0 MIFO  1                08.99                  1
1 3DDC120672110.50 002 1 1 DAIN  1                02.65                  1
1 3DDC120672110.50 003 1 0 MIGR  1                03.58                  1
1 3DDC120672110.50 003 1 6 AGOS E1                00.16                  1
1 3DDC120672110.50 003 1 0 MIOT  2                08.87                  1
1 3DDC120672110.50 003 1 6 CEAR 41                01.12                  1
1 3DDC120672110.50 003 1 6 ACMI 21                02.29                  1
1 3DDC120672110.50 003 1 6 ERSP 41                01.22                  1
1 3DDC120672110.50 003 1 6 ARCO 51                00.10                  1
1 3DDC120672110.50 003 1 1 AGSU  3                08.14                  1
1 3DDC120672110.50 003 1 0 MIFO  1                05.82                  1
1 3DDC120672110.50 003 1 1 FEID  3                03.40                  1
1 3DDC120672110.50 003 1 3 CARE X1                00.24                  1
1 3DDC120672110.50 003 1 1 AGSU  1                11.44                  1
1 3DDC120672110.50 003 1 1 FEID  1                06.40                  1
1 3DDC120672110.50 003 1 6 LUAR 31                01.17                  1
1 3DDC120672110.50 003 1 6 GABO 21                00.10                  1
1 3DDC120672110.50 004 1 1 FEID  1                18.70                  1
1 3DDC120672110.50 004 1 0 MIFO  1                11.90                  1
1 3DDC120672110.50 004 1 3 CARE X1                00.50                  1
1 3DDC120672110.50 004 1 6 AGOS E1                00.26                  1
1 3DDC120672110.50 004 1 6 CEAR 41                04.46                  1
1 3DDC120672110.50 004 1 1 AGSU  3                08.03                  1
1 3DDC120672110.50 004 1 0 MIGR  1                03.16                  1
1 3DDC120672110.50 004 1 1 FEID  3                06.60                  1
1 3DDC120672110.50 004 1 6 ARCO 51                00.86                  1
1 3DDC120672110.50 004 1 6 ACMI 21                01.23                  1
1 3DDC120672110.50 004 1 0 MIOT  2                03.88                  1
1 3DDC120672110.50 004 1 6 LUAR 31                00.51                  1
1 3DDC120672110.50 004 1 6 ERSP 41                01.03                  1
```

1	3DDC120672110.50	004	1	1	AGSU	1	10.43	1
1	3DDC120672110.50	004	1	6	GABO	21	03.06	1
1	3DDC120672110.50	005	1	1	DAIN	1	03.00	1
1	3DDC120672110.50	005	1	6	GABO	21	00.63	1
1	3DDC120672110.50	005	1	6	ERSP	41	01.66	1
1	3DDC120672110.50	005	1	1	AGSU	1	08.63	1
1	3DDC120672110.50	005	1	1	FEID	1	31.30	1
1	3DDC120672110.50	005	1	1	FEID	3	20.90	1
1	3DDC120672110.50	005	1	0	MIGR	1	01.50	1
1	3DDC120672110.50	005	1	1	AGSU	3	02.95	1
1	3DDC120672110.50	005	1	0	MIOT	2	11.30	1
1	3DDC120672110.50	005	1	6	ACMI	21	00.97	1
1	3DDC120672110.50	005	1	6	LUAR	31	00.70	1
1	3DDC120672110.50	005	1	6	ARCO	51	03.70	1
1	3DDC120672110.50	005	1	0	MIFO	1	07.70	1
1	3DDC120672110.50	005	1	3	CARE	X1	00.50	1
1	3DDC120672110.50	005	1	6	CEAR	41	00.44	1
1	3DDC120672110.50	006	1	1	FEID	3	12.99	1
1	3DDC120672110.50	006	1	6	ERSP	41	01.44	1
1	3DDC120672110.50	006	1	1	AGSU	3	02.40	1
1	3DDC120672110.50	006	1	0	MIFO	1	06.50	1
1	3DDC120672110.50	006	1	1	FEID	1	20.16	1
1	3DDC120672110.50	006	1	6	LUAR	31	00.30	1
1	3DDC120672110.50	006	1	1	AGSU	1	09.47	1
1	3DDC120672110.50	006	1	3	CARE	X1	00.50	1
1	3DDC120672110.50	006	1	6	ACMI	21	01.00	1
1	3DDC120672110.50	006	1	6	CEAR	41	00.35	1
1	3DDC120672110.50	006	1	0	MIOT	2	02.47	1
1	3DDC120672110.50	006	1	6	ARCO	51	09.34	1
1	3DDC120672110.50	007	1	1	AGSU	3	08.40	1
1	3DDC120672110.50	007	1	1	FEID	3	19.07	1
1	3DDC120672110.50	007	1	1	FEID	1	21.10	1
1	3DDC120672110.50	007	1	1	AGSU	1	10.12	1
1	3DDC120672110.50	007	1	6	LUAR	31	01.01	1
1	3DDC120672110.50	007	1	3	CARE	X1	00.22	1
1	3DDC120672110.50	007	1	0	MIFO	1	25.40	1
1	3DDC120672110.50	007	1	1	DAIN	1	00.80	1
1	3DDC120672110.50	007	1	6	ACMI	21	01.02	1
1	3DDC120672110.50	007	1	6	CEAR	41	00.50	1
1	3DDC120672110.50	007	1	6	AGOS	E1	01.20	1
1	3DDC120672110.50	007	1	6	GABO	21	00.28	1
1	3DDC120672110.50	007	1	6	ERSP	41	01.22	1
1	3DDC120672110.50	007	1	6	ARCO	51	02.62	1
1	3DDC120672110.50	007	1	0	MIOT	2	12.12	1
1	3DDC120672110.50	008	1	1	AGSU	3	10.40	1
1	3DDC120672110.50	008	1	1	FEID	3	13.88	1
1	3DDC120672110.50	008	1	0	MIOT	2	05.57	1
1	3DDC120672110.50	008	1	0	MIFO	1	06.21	1
1	3DDC120672110.50	008	1	1	AGSU	1	23.35	1
1	3DDC120672110.50	008	1	3	CARE	X1	02.15	1
1	3DDC120672110.50	008	1	1	MIGR	1	01.31	1
1	3DDC120672110.50	008	1	6	ARCO	51	04.80	1
1	3DDC120672110.50	008	1	6	ACMI	21	00.40	1
1	3DDC120672110.50	008	1	1	FEID	1	18.63	1
1	3DDC120672110.50	008	1	6	GABO	21	00.16	1
1	3DDC120672110.50	009	1	1	AGSU	3	62.73	1
1	3DDC120672110.50	009	1	6	ACMI	21	01.03	1
1	3DDC120672110.50	009	1	0	MIGR	1	03.80	1
1	3DDC120672110.50	009	1	6	ERSP	41	02.00	1
1	3DDC120672110.50	009	1	6	ARCO	51	00.20	1

1	3DDC120672110.50	009	1	0	MIFO	1	07.00	1
1	3DDC120672110.50	009	1	6	AGOS	E1	00.43	1
1	3DDC120672110.50	009	1	3	CARE	X1	00.56	1
1	3DDC120672110.50	009	1	0	MIOT	2	16.50	1
1	3DDC120672110.50	009	1	1	AGSU	1	25.10	1
1	3DDC120672110.50	009	1	1	FEID	1	06.70	1
1	3DDC120672110.50	009	1	1	FEID	3	05.80	1
1	3DDC120672110.50	010	1	6	GABO	21	01.81	1
1	3DDC120672110.50	010	1	1	DAIN	1	01.20	1
1	3DDC120672110.50	010	1	1	FEID	3	11.03	1
1	3DDC120672110.50	010	1	0	MIOT	2	01.04	1
1	3DDC120672110.50	010	1	6	ARCO	51	11.05	1
1	3DDC120672110.50	010	1	1	AGSU	3	08.86	1
1	3DDC120672110.50	010	1	1	FEID	1	25.57	1
1	3DDC120672110.50	010	1	1	MIGR	1	02.20	1
1	3DDC120672110.50	010	1	6	LUAR	31	00.85	1
1	3DDC120672110.50	010	1	6	ACMI	21	00.30	1
1	3DDC120672110.50	010	1	1	AGSU	1	10.10	1
1	3DDC120672110.50	010	1	6	ERSP	41	01.53	1
1	3DDC120672110.50	010	1	0	MIFO	1	08.08	1
1	3DDC120672120.50	001	1	6	LUAR	31	11.89	1
1	3DDC120672120.50	001	1	1	AGSU	1	20.34	1
1	3DDC120672120.50	001	1	3	CARE	X1	03.39	1
1	3DDC120672120.50	001	1	1	DAIN	1	00.19	1
1	3DDC120672120.50	001	1	1	AGSU	3	11.32	1
1	3DDC120672120.50	001	1	0	MIGR	1	01.28	1
1	3DDC120672120.50	001	1	6	ERSP	41	01.64	1
1	3DDC120672120.50	001	1	0	MIOT	2	11.55	1
1	3DDC120672120.50	001	1	1	FEID	1	13.71	1
1	3DDC120672120.50	001	1	0	MIFO	1	13.53	1
1	3DDC120672120.50	001	1	1	FEID	3	12.52	1
1	3DDC120672120.50	001	1	6	ACMI	21	01.37	1
1	3DDC120672120.50	001	1	6	ARCO	51	04.18	1
1	3DDC120672120.50	001	1	1	DAIN	1	00.15	1
1	3DDC120672120.50	002	1	1	FEID	3	18.40	1
1	3DDC120672120.50	002	1	0	MIGR	3	04.55	1
1	3DDC120672120.50	002	1	1	AGSU	3	04.43	1
1	3DDC120672120.50	002	1	0	MIGR	1	02.29	1
1	3DDC120672120.50	002	1	1	FEID	1	23.24	1
1	3DDC120672120.50	002	1	1	DAIN	1	00.27	1
1	3DDC120672120.50	002	1	6	ARCO	51	03.92	1
1	3DDC120672120.50	002	1	6	LUAR	31	10.04	1
1	3DDC120672120.50	002	1	0	MIFO	1	17.25	1
1	3DDC120672120.50	002	1	3	CARE	X1	01.87	1
1	3DDC120672120.50	002	1	1	AGSU	1	12.21	1
1	3DDC120672120.50	002	1	6	ERSP	41	01.36	1
1	3DDC120672120.50	002	1	6	ACMI	21	00.39	1
1	3DDC120672120.50	003	1	1	AGSU	3	08.10	1
1	3DDC120672120.50	003	1	0	MIOT	2	05.14	1
1	3DDC120672120.50	003	1	1	AGSU	1	18.36	1
1	3DDC120672120.50	003	1	6	LUAR	31	00.89	1
1	3DDC120672120.50	003	1	6	ARCO	51	02.39	1
1	3DDC120672120.50	003	1	1	FEID	3	12.50	1
1	3DDC120672120.50	003	1	6	GABO	21	03.19	1
1	3DDC120672120.50	003	1	3	CARE	X1	01.14	1
1	3DDC120672120.50	003	1	6	ERSP	41	02.68	1
1	3DDC120672120.50	003	1	0	MIFO	1	09.37	1
1	3DDC120672120.50	003	1	1	FEID	1	13.82	1
1	3DDC120672120.50	003	1	6	ACMI	21	00.61	1
1	3DDC120672120.50	003	1	6	CEAR	41	01.46	1

1	3DDC120672120.50	003	1	0	MIGR	1	00.61	1
1	3DDC120672120.50	003	1	0	MIGR	1	00.29	1
1	3DDC120672120.50	004	1	0	MIFO	1	06.63	1
1	3DDC120672120.50	004	1	0	MIGR	1	00.44	1
1	3DDC120672120.50	004	1	6	AGOS	E1	02.82	1
1	3DDC120672120.50	004	1	6	ARCO	51	02.62	1
1	3DDC120672120.50	004	1	1	FEID	3	13.93	1
1	3DDC120672120.50	004	1	1	AGSU	3	03.70	1
1	3DDC120672120.50	004	1	1	AGSU	1	15.78	1
1	3DDC120672120.50	004	1	0	MIOT	2	08.91	1
1	3DDC120672120.50	004	1	3	CARE	X1	00.23	1
1	3DDC120672120.50	004	1	6	CEAR	41	00.54	1
1	3DDC120672120.50	004	1	6	ACMI	21	00.98	1
1	3DDC120672120.50	004	1	6	LUAR	31	05.85	1
1	3DDC120672120.50	004	1	1	DAIN	1	00.41	1
1	3DDC120672120.50	004	1	1	FEID	1	14.52	1
1	3DDC120672120.50	004	1	6	GABO	21	04.99	1
1	3DDC120672120.50	004	1	6	ERSP	41	01.17	1
1	3DDC120672120.50	005	1	0	MIFO	1	38.97	1
1	3DDC120672120.50	005	1	1	FEID	3	12.50	1
1	3DDC120672120.50	005	1	6	ARCO	51	04.01	1
1	3DDC120672120.50	005	1	6	LUAR	31	06.06	1
1	3DDC120672120.50	005	1	6	AGOS	E1	03.69	1
1	3DDC120672120.50	005	1	6	ACMI	21	00.59	1
1	3DDC120672120.50	005	1	1	AGSU	1	06.92	1
1	3DDC120672120.50	005	1	0	MIOT	2	04.25	1
1	3DDC120672120.50	005	1	6	CEAR	41	00.36	1
1	3DDC120672120.50	005	1	1	AGSU	3	05.95	1
1	3DDC120672120.50	005	1	1	FEID	1	25.06	1
1	3DDC120672120.50	006	1	1	AGSU	3	04.93	1
1	3DDC120672120.50	006	1	6	ACMI	21	00.63	1
1	3DDC120672120.50	006	1	6	LUAR	31	04.82	1
1	3DDC120672120.50	006	1	1	AGSU	1	08.37	1
1	3DDC120672120.50	006	1	6	ARCO	51	00.44	1
1	3DDC120672120.50	006	1	0	MIFO	1	09.97	1
1	3DDC120672120.50	006	1	1	FEID	3	13.45	1
1	3DDC120672120.50	006	1	1	DAIN	1	00.13	1
1	3DDC120672120.50	006	1	1	FEID	1	18.66	1
1	3DDC120672120.50	006	1	6	GABO	21	01.95	1
1	3DDC120672120.50	006	1	3	CARE	X1	00.92	1
1	3DDC120672120.50	006	1	6	CEAR	41	00.33	1
1	3DDC120672120.50	006	1	6	ERSP	41	00.37	1
1	3DDC120672120.50	007	1	0	MIOT	2	10.78	1
1	3DDC120672120.50	007	1	6	LUAR	31	02.44	1
1	3DDC120672120.50	007	1	6	ACMI	21	00.87	1
1	3DDC120672120.50	007	1	1	DAIN	1	00.11	1
1	3DDC120672120.50	007	1	6	CEAR	41	00.10	1
1	3DDC120672120.50	007	1	1	FEID	1	08.54	1
1	3DDC120672120.50	007	1	1	AGSU	1	08.39	1
1	3DDC120672120.50	007	1	1	AGSU	3	03.97	1
1	3DDC120672120.50	007	1	1	FEID	3	04.46	1
1	3DDC120672120.50	007	1	0	MIGR	1	00.95	1
1	3DDC120672120.50	007	1	6	AGOS	E1	01.45	1
1	3DDC120672120.50	007	1	3	CARE	X1	00.32	1
1	3DDC120672120.50	007	1	0	MIFO	1	14.97	1
1	3DDC120672120.50	007	1	6	ARCO	51	01.60	1
1	3DDC120672120.50	008	1	0	MIGR	1	02.75	1
1	3DDC120672120.50	008	1	6	ACMI	21	00.84	1
1	3DDC120672120.50	008	1	1	FEID	1	07.12	1
1	3DDC120672120.50	008	1	6	LUAR	31	09.39	1

```
 04/11/74 +CSU SCOPE 3.3  B    C012 C013 C140 C141 02/08/74
14.50.11.TA601ZU   FROM  AB        SA
14.50.11.TA601,AFZR****,T20,MT1.CVB/TR.
14.50.11.FTN.
14.50.20.       .300 CP SECONDS COMPILATION TIME
14.50.20.REWIND(OUTPUT)
14.50.21.MAP(OFF)
14.50.21.RFL(10000)
14.50.21.FL= 010000 CP 00000.310SEC.  IO 00002.200SEC.
14.50.21.REQUEST,TAPE1,HY,VSN=D0918,READ.
14.50.40. OP-JRS
14.50.42. (23 ASSIGNED)
14.50.47.REWIND(TAPE1)
14.50.47.SKIPF(TAPE1,1,17,C)
14.50.54.RFL(30000)
14.50.54.FL= 030000 CP 00000.313SEC.  IO 00005.708SEC.
14.50.54.LGO.
14.51.01.FL= 014500 CP 00000.587SEC.  IO 00006.353SEC.
14.51.03.STOP
14.51.03.RFL(10000)
14.51.03.FL= 010000 CP 00001.732SEC.  IO 00007.150SEC.
14.51.03.REWIND(TAPE1,TAPE6)
14.51.05.COPYSBF(TAPE6)
14.51.05.FL= 000300 CP 00001.814SEC.  IO 00007.532SEC.
14.51.05.FL= 010000 CP 00001.815SEC.  IO 00007.532SEC.
14.51.06.CP       1.815 SEC.
14.51.06.IO       7.532 SEC.
```

Belowground Plant Biomass

The belowground biomass were collected at the Bridger Site on Form NREL-03 for 1972. These data have the Grassland Biome designation of A2U0023. Examples of the data form and data follow.

IBP

GRASSLAND BIOME

U.S. INTERNATIONAL BIOLOGICAL PROGRAM

FIELD DATA SHEET - BELOWGROUND BIOMASS

DATA TYPE	SITE	INITIALS	DATE Day	DATE Mo	DATE Yr	TREATMENT	REPLICATE	PLOT SIZE	QUADRAT	CORE DIAM.	HORIZON	TOP DEPTH	BOTTOM DEP.	LENGTH	WASH WT.	DRY WT.	ASH WT.	CROWN DRY WT.
1-2	3-4	5-7	8-9	10-11	12-13	14	15	16-19	21-23	25-27	29	31-33	35-37	39-41	43-47	49-54	56-61	63-68

DATA TYPE
01 Aboveground Biomass
02 Litter
03 Belowground Biomass
10 Vertebrate - Live Trapping
11 Vertebrate - Snap Trapping
12 Vertebrate - Collection
20 Avian Flush Census
21 Avian Road Count
22 Avian Road Count Summary
23 Avian Collection - Internal
24 Avian Collection - External
25 Avian Collection - Plumage
30 Invertebrate
40 Microbiology - Decomposition
41 Microbiology - Nitrogen
42 Microbiology - Biomass
43 Microbiology - Root Decomposition
44 Microbiology - Respiration

SITE
01 Ale
02 Bison
03 Bridger
04 Cottonwood
05 Dickinson
06 Hays
07 Hopland
08 Jornada
09 Osage
10 Pantex
11 Pawnee

TREATMENT
1 Ungrazed
2 Lightly grazed
3 Moderately grazed
4 Heavily grazed
5 Grazed 1969, ungrazed 1970
6
7
8
9

HORIZON
1 AO
2 A
3 B
4 C

FIELD DATA

1 2 3 4 5 6 7

123456789012345678901234567890123456789012345678901234567890123456789012345

0303TLH081172110.50	001	2.5	00	10	10	3.0	.67	.47
0303TLH081172110.50	001	2.5	10	20	10	3.0	.16	.10
0303TLH081172110.50	001	2.5	20	30	10	3.0	.13	.05
0303TLH081172110.50	001	2.5	30	40	10	3.0	.05	.04
0303TLH081172110.50	001	2.5	40	50	10	3.0	.06	.04
0303TLH081172110.50	002	2.5	00	10	10	3.0	.23	.14
0303TLH081172110.50	002	2.5	10	20	10	3.0	.30	.17
0303TLH081172110.50	002	2.5	20	30	10	3.0	.06	.04
0303TLH081172110.50	002	2.5	30	40	10	3.0	.07	.04
0303TLH081172110.50	002	2.5	40	50	10	3.0	.05	.02
0303TLH081172110.50	003	2.5	00	10	10	3.0	.53	.28
0303TLH081172110.50	003	2.5	10	20	10	3.0	.37	.10
0303TLH081172110.50	003	2.5	20	30	10	3.0	.10	.04
0303TLH081172110.50	003	2.5	30	40	10	3.0	.10	.02
0303TLH081172110.50	003	2.5	40	50	10	3.0	.05	.03
0303TLH081172110.50	004	2.5	00	10	10	3.0	1.31	.72
0303TLH081172110.50	004	2.5	10	20	10	3.0	.20	.06
0303TLH081172110.50	004	2.5	20	30	10	3.0	.08	.05
0303TLH081172110.50	004	2.5	30	40	10	3.0	.07	.04
0303TLH081172110.50	004	2.5	40	50	10	3.0	.04	.02
0303TLH081172110.50	005	2.5	00	10	10	3.0	1.18	.67
0303TLH081172110.50	005	2.5	10	20	10	3.0	.06	.04
0303TLH081172110.50	005	2.5	20	30	10	3.0	.12	.05
0303TLH081172110.50	005	2.5	30	40	10	3.0	.18	.06
0303TLH081172110.50	005	2.5	40	50	10	3.0	.14	.07
0303TLH081172110.50	006	2.5	00	10	10	3.0	.87	.57
0303TLH081172110.50	006	2.5	10	20	10	3.0	.22	.13
0303TLH081172110.50	006	2.5	20	30	10	3.0	.08	.04
0303TLH081172110.50	006	2.5	30	40	10	3.0	.03	.02
0303TLH081172110.50	006	2.5	40	50	10	3.0	.03	.02
0303TLH081172110.50	007	2.5	00	10	10	3.0	.88	.56
0303TLH081172110.50	007	2.5	10	20	10	3.0	.34	.13
0303TLH081172110.50	007	2.5	20	30	10	3.0	.11	.05
0303TLH081172110.50	007	2.5	30	40	10	3.0	.03	.02
0303TLH081172110.50	007	2.5	40	50	10	3.0	.37	.06
0303TLH081172110.50	008	2.5	00	10	10	3.0	1.76	1.43
0303TLH081172110.50	008	2.5	10	20	10	3.0	.15	.09
0303TLH081172110.50	008	2.5	20	30	10	3.0	.09	.04
0303TLH081172110.50	008	2.5	30	40	10	3.0	.02	.00
0303TLH081172110.50	008	2.5	40	50	10	3.0	.05	.02
0303TLH081172110.50	009	2.5	00	10	10	3.0	1.57	.84
0303TLH081172110.50	009	2.5	20	30	10	3.0	.10	.06
0303TLH081172110.50	009	2.5	30	40	10	3.0	.05	.04
0303TLH081172110.50	009	2.5	40	50	10	3.0	.06	.06
0303TLH081172110.50	010	2.5	00	10	10	3.0	.45	.32
0303TLH081172110.50	010	2.5	10	20	10	3.0	.35	.16
0303TLH081172110.50	010	2.5	20	30	10	3.0	.07	.04
0303TLH081172110.50	010	2.5	30	40	10	3.0	.03	.03
0303TLH081172110.50	010	2.5	40	50	10	3.0	.05	.03
0303TLH081172120.50	001	2.5	00	10	10	3.0	.60	.44
0303TLH081172120.50	001	2.5	10	20	10	3.0	.31	.11
0303TLH081172120.50	001	2.5	20	30	10	3.0	.09	.04
0303TLH081172120.50	001	2.5	30	40	10	3.0	.08	.05

0303TLH081172120.50	001	2.5	40	50	10	3.0	.05	.04
0303TLH081172120.50	002	2.5	00	10	10	3.0	.73	.42
0303TLH081172120.50	002	2.5	10	20	10	3.0	.36	.13
0303TLH081172120.50	002	2.5	20	30	10	3.0	.12	.05
0303TLH081172120.50	002	2.5	30	40	10	3.0	.03	.03
0303TLH081172120.50	002	2.5	40	50	10	3.0	.03	.02
0303TLH081172120.50	003	2.5	00	10	10	3.0	.92	.53
0303TLH081172120.50	003	2.5	10	20	10	3.0	.34	.12
0303TLH081172120.50	003	2.5	20	30	10	3.0	.18	.08
0303TLH081172120.50	003	2.5	30	40	10	3.0	.08	.04
0303TLH081172120.50	003	2.5	40	50	10	3.0	.02	.02
0303TLH081172120.50	004	2.5	00	10	10	3.0	.77	.49
0303TLH081172120.50	004	2.5	10	20	10	3.0	.28	.09
0303TLH081172120.50	004	2.5	20	30	10	3.0	.07	.04
0303TLH081172120.50	004	2.5	30	40	10	3.0	.03	.02
0303TLH081172120.50	004	2.5	40	50	10	3.0	.05	.02
0303TLH081172120.50	005	2.5	00	10	10	3.0	.35	.21
0303TLH081172120.50	005	2.5	10	20	10	3.0	.11	.05
0303TLH081172120.50	005	2.5	20	30	10	3.0	.08	.04
0303TLH081172120.50	005	2.5	30	40	10	3.0	.01	.01
0303TLH081172120.50	005	2.5	40	50	10	3.0	.01	.01
0303TLH081172120.50	006	2.5	00	10	10	3.0	.71	.40
0303TLH081172120.50	006	2.5	10	20	10	3.0	.50	.24
0303TLH081172120.50	006	2.5	20	30	10	3.0	.08	.04
0303TLH081172120.50	006	2.5	30	40	10	3.0	.09	.06
0303TLH081172120.50	006	2.5	40	50	10	3.0	.04	.03
0303TLH081172120.50	007	2.5	00	10	10	3.0	.51	.31
0303TLH081172120.50	007	2.5	10	20	10	3.0	.25	.14
0303TLH081172120.50	007	2.5	20	30	10	3.0	.07	.00
0303TLH081172120.50	007	2.5	30	40	10	3.0	.03	.04
0303TLH081172120.50	007	2.5	40	50	10	3.0	.05	.03
0303TLH081172120.50	008	2.5	00	10	10	3.0	.42	.31
0303TLH081172120.50	008	2.5	10	20	10	3.0	.06	.04
0303TLH081172120.50	008	2.5	20	30	10	3.0	.04	.03
0303TLH081172120.50	008	2.5	30	40	10	3.0	.03	.03
0303TLH081172120.50	008	2.5	40	50	10	3.0	.03	.02
0303TLH081172120.50	009	2.5	00	10	10	3.0	.68	.52
0303TLH081172120.50	009	2.5	10	20	10	3.0	.05	.05
0303TLH081172120.50	009	2.5	20	30	10	3.0	.02	.02
0303TLH081172120.50	009	2.5	30	40	10	3.0	.02	.02
0303TLH081172120.50	009	2.5	40	50	10	3.0	.02	.02
0303TLH081172120.50	010	2.5	00	10	10	3.0	.52	.43
0303TLH081172120.50	010	2.5	10	20	10	3.0	.08	.07
0303TLH081172120.50	010	2.5	20	30	10	3.0	.07	.06
0303TLH081172120.50	010	2.5	30	40	10	3.0	.03	.03
0303TLH081172120.50	010	2.5	40	50	10	3.0	.01	.01
0303TLH081172510.50	001	2.5	00	10	10	3.0	.70	.50
0303TLH081172510.50	001	2.5	10	20	10	3.0	.09	.07
0303TLH081172510.50	001	2.5	20	30	10	3.0	.01	.01
0303TLH081172510.50	001	2.5	30	40	10	3.0	.00	.00
0303TLH081172510.50	001	2.5	40	50	10	3.0	.01	.01
0303TLH081172510.50	002	2.5	00	10	10	3.0	.55	.30
0303TLH081172510.50	002	2.5	10	20	10	3.0	.34	.24
0303TLH081172510.50	002	2.5	20	30	10	3.0	.08	.03
0303TLH081172510.50	002	2.5	30	40	10	3.0	.02	.01
0303TLH081172510.50	002	2.5	40	50	10	3.0	.01	.00
0303TLH081172510.50	003	2.5	00	10	10	3.0	.85	.61
0303TLH081172510.50	003	2.5	10	20	10	3.0	.22	.15
0303TLH081172510.50	003	2.5	20	30	10	3.0	.12	.06

0303TLH081172510.50	003	2.5	30	40	10	3.0	.03	.02
0303TLH081172510.50	003	2.5	40	50	10	3.0	.02	.00
0303TLH081172510.50	004	2.5	00	10	10	3.0	.86	.54
0303TLH081172510.50	004	2.5	10	20	10	3.0	.06	.03
0303TLH081172510.50	004	2.5	20	30	10	3.0	.06	.04
0303TLH081172510.50	004	2.5	30	40	10	3.0	.04	.01
0303TLH081172510.50	004	2.5	40	50	10	3.0	.02	.00
0303TLH081172510.50	005	2.5	00	10	10	3.0	1.10	.69
0303TLH081172510.50	005	2.5	10	20	10	3.0	.21	.08
0303TLH081172510.50	005	2.5	20	30	10	3.0	.09	.04
0303TLH081172510.50	005	2.5	30	40	10	3.0	.04	.03
0303TLH081172510.50	005	2.5	40	50	10	3.0	.02	.01
0303TLH081172510.50	006	2.5	00	10	10	3.0	1.31	.73
0303TLH081172510.50	006	2.5	10	20	10	3.0	.23	.11
0303TLH081172510.50	006	2.5	20	30	10	3.0	.06	.02
0303TLH081172510.50	006	2.5	30	40	10	3.0	.05	.01
0303TLH081172510.50	006	2.5	40	50	10	3.0	.07	.02
0303TLH081172510.50	007	2.5	00	10	10	3.0	.88	.56
0303TLH081172510.50	007	2.5	10	20	10	3.0	.11	.04
0303TLH081172510.50	007	2.5	20	30	10	3.0	.06	.03
0303TLH081172510.50	007	2.5	30	40	10	3.0	.01	.00
0303TLH081172510.50	007	2.5	40	50	10	3.0	.04	.01
0303TLH081172510.50	008	2.5	00	10	10	3.0	.99	.61
0303TLH081172510.50	008	2.5	10	20	10	3.0	.18	.09
0303TLH081172510.50	008	2.5	20	30	10	3.0	.09	.03
0303TLH081172510.50	008	2.5	30	40	10	3.0	.06	.03
0303TLH081172510.50	008	2.5	40	50	10	3.0	.03	.01
0303TLH081172510.50	009	2.5	00	10	10	3.0	.77	.55
0303TLH081172510.50	009	2.5	10	20	10	3.0	.11	.05
0303TLH081172510.50	009	2.5	20	30	10	3.0	.07	.04
0303TLH081172510.50	009	2.5	30	40	10	3.0	.04	.03
0303TLH081172510.50	009	2.5	40	50	10	3.0	.02	.01
0303TLH081172510.50	010	2.5	00	10	10	3.0	.40	.20
0303TLH081172510.50	010	2.5	10	20	10	3.0	.29	.13
0303TLH081172510.50	010	2.5	20	30	10	3.0	.08	.05
0303TLH081172510.50	010	2.5	30	40	10	3.0	.03	.02
0303TLH081172510.50	010	2.5	40	50	10	3.0	.02	.02
0303TLH081172520.50	001	2.5	00	10	10	3.0	.83	.52
0303TLH081172520.50	001	2.5	10	20	10	3.0	.27	.15
0303TLH081172520.50	001	2.5	20	30	10	3.0	.03	.03
0303TLH081172520.50	001	2.5	30	40	10	3.0	.03	.03
0303TLH081172520.50	002	2.5	00	10	10	3.0	.63	.40
0303TLH081172520.50	002	2.5	10	20	10	3.0	.19	.10
0303TLH081172520.50	002	2.5	20	30	10	3.0	.15	.08
0303TLH081172520.50	002	2.5	30	40	10	3.0	.05	.02
0303TLH081172520.50	003	2.5	00	10	10	3.0	.38	.22
0303TLH081172520.50	003	2.5	10	20	10	3.0	.18	.10
0303TLH081172520.50	003	2.5	20	30	10	3.0	.14	.09
0303TLH081172520.50	003	2.5	30	40	10	3.0	.08	.06
0303TLH081172520.50	004	2.5	00	10	10	3.0	.68	.43
0303TLH081172520.50	004	2.5	10	20	10	3.0	.17	.09
0303TLH081172520.50	004	2.5	20	30	10	3.0	.15	.07
0303TLH081172520.50	004	2.5	30	40	10	3.0	.10	.05
0303TLH081172520.50	004	2.5	40	50	10	3.0	.05	.02
0303TLH081172520.50	005	2.5	00	10	10	3.0	.73	.48
0303TLH081172520.50	005	2.5	10	20	10	3.0	.11	.05
0303TLH081172520.50	005	2.5	20	30	10	3.0	.07	.03
0303TLH081172520.50	005	2.5	30	40	10	3.0	.04	.02
0303TLH081172520.50	005	2.5	40	50	10	3.0	.06	.03

0303TLH081172520.50	006	2.5	00	10	10	3.0	1.41	.88
0303TLH081172520.50	006	2.5	10	20	10	3.0	.18	.09
0303TLH081172520.50	006	2.5	20	30	10	3.0	.05	.02
0303TLH081172520.50	006	2.5	30	40	10	3.0	.05	.05
0303TLH081172520.50	006	2.5	40	50	10	3.0	.05	.02
0303TLH081172520.50	007	2.5	00	10	10	3.0	.27	.21
0303TLH081172520.50	007	2.5	10	20	10	3.0	.06	.04
0303TLH081172520.50	007	2.5	20	30	10	3.0	.02	.02
0303TLH081172520.50	008	2.5	00	10	10	3.0	.90	.60
0303TLH081172520.50	008	2.5	10	20	10	3.0	.31	.11
0303TLH081172520.50	008	2.5	20	30	10	3.0	.09	.08
0303TLH081172520.50	008	2.5	30	40	10	3.0	.05	.04
0303TLH081172520.50	008	2.5	40	50	10	3.0	.02	.02
0303TLH081172520.50	009	2.5	00	10	10	3.0	1.20	.80
0303TLH081172520.50	009	2.5	10	20	10	3.0	.29	.16
0303TLH081172520.50	009	2.5	20	30	10	3.0	.15	.07
0303TLH081172520.50	009	2.5	30	40	10	3.0	.12	.07
0303TLH081172520.50	009	2.5	40	50	10	3.0	.06	.04
0303TLH081172520.50	010	2.5	00	10	10	3.0	.38	.30
0303TLH081172520.50	010	2.5	10	20	10	3.0	.12	.06
0303TLH081172520.50	010	2.5	20	30	10	3.0	.03	.02
0303TLH081172520.50	010	2.5	30	40	10	3.0	.01	.00

Litter

The litter data for Bridger were collected on Form NREL-02. Four-foot and nine-foot snow fence areas were sampled. The snow fence treatment numbers are 6 and 7, respectively. These data have the Grassland Biome designation of A2U0013. Examples of the data form and data follow.

IBP

GRASSLAND BIOME

U.S. INTERNATIONAL BIOLOGICAL PROGRAM

FIELD DATA-SHEET - LITTER

J TA TYPE	SITE	INITIALS	DATE			TREATMENT	REPLICATE	PLOT SIZE	QUADRAT	TYPE	SACK NO.	DRY WT.	SACK WT.	ASH WT.	PREVIOUS DATE			
			Day	Mo	Yr										Day	Mo	Yr	
1-2	3-4	5-7	8-9	10-11	12-13	14	15	16-19	21-23	25	27-30	32-37	39-42	44-49	51-52	53-54	55-56	

DATA TYPE
- 01 Aboveground Biomass
- 02 Litter
- 03 Belowground Biomass
- 10 Vertebrate - Live Trapping
- 11 Vertebrate - Snap Trapping
- 12 Vertebrate - Collection
- 20 Avian Flush Census
- 21 Avian Road Count
- 22 Avian Road Count Summary
- 23 Avian Collection - Internal
- 24 Avian Collection - External
- 25 Avian Collection - Plumage
- 30 Invertebrate
- 40 Microbiology - Decomposition
- 41 Microbiology - Nitrogen
- ,2 Microbiology - Biomass
- 43 Microbiology - Root Decomposition
- 44 Microbiology - Respiration

SITE
- 01 Ale
- 02 Bison
- 03 Bridger
- 04 Cottonwood
- 05 Dickinson
- 06 Hays
- 07 Hopland
- 08 Jornada
- 09 Osage
- 10 Pantex
- 11 Pawnee

TREATMENT
- 1 Ungrazed
- 2 Lightly grazed
- 3 Moderately grazed
- 4 Heavily grazed
- 5 Grazed 1969, ungrazed 1970
- 6
- 7
- 8
- 9

YPE
- 1 Quadrat, total
- 2 Quadrat, part
- 3 Cleared plot
- 4 Litter bag

****EXAMPLE OF DATA****

```
         1         2         3         4         5         6         7
1234567890123456789012345678901234567890123456789012345678901234567890123

0203DDC270672110.50 001 1         50.23 2.00  1.59
0203DDC270672110.50 002 1         45.33 2.00  1.59
0203DDC270672110.50 003 1         51.48 2.00  1.59
0203DDC270672110.50 004 1         52.71 2.00  1.59
0203DDC270672110.50 005 1         56.93 2.00  1.59
0203DDC270672110.50 006 1         72.70 2.00  1.59
0203DDC270672110.50 007 1         48.20 2.00  1.59
0203DDC270672110.50 008 1         83.80 2.00  1.59
0203DDC270672110.50 009 1        108.22 2.00  1.59
0203DDC270672110.50 010 1         76.90 2.00  1.59
0203DDC270672120.50 001 1         40.21 2.00  1.73
0203DDC270672120.50 002 1         49.74 2.00  1.73
0203DDC270672120.50 003 1         37.72 2.00  1.73
0203DDC270672120.50 004 1         28.08 2.00  1.73
0203DDC270672120.50 005 1         40.39 2.00  1.73
0203DDC270672120.50 006 1         54.26 2.00  1.73
0203DDC270672120.50 007 1         30.96 2.00  1.73
0203DDC270672120.50 008 1         35.49 2.00  1.73
0203DDC270672120.50 009 1         49.27 2.00  1.73
0203DDC270672120.50 010 1         69.35 2.00  1.73
0203DDC280672610.50 001 1         15.40
0203DDC280672610.50 002 1         13.10
0203DDC280672610.50 003 1         07.88
0203DDC280672610.50 004 1         14.86
0203DDC280672610.50 005 1         11.49
0203DDC280672610.50 006 1         12.88
0203DDC280672610.50 007 1         12.89
0203DDC280672610.50 008 1         09.30
0203DDC280672610.50 009 1         10.97
0203DDC280672610.50 010 1         56.72
0203DDC280672710.50 001 1         02.63
0203DDC280672710.50 002 1         15.86
0203DDC280672710.50 003 1         04.85
0203DDC280672710.50 004 1         18.48
0203DDC280672710.50 005 1         11.72
0203DDC280672710.50 006 1         05.69
0203DDC280672710.50 007 1         15.98
0203DDC280672710.50 008 1        107.94
0203DDC280672710.50 009 1         09.93
0203DDC280672710.50 010 1         66.01
0203DDC270672510.50 001 1         86.63 2.00  1.56
0203DDC270672510.50 002 1         80.19 2.00  1.56
0203DDC270672510.50 003 1         93.50 2.00  1.56
0203DDC270672510.50 004 1         47.94 2.00  1.56
0203DDC270672510.50 005 1         27.22 2.00  1.56
0203DDC270672510.50 006 1         34.72 2.00  1.56
0203DDC270672510.50 007 1         47.72 2.00  1.56
0203DDC270672510.50 008 1         39.51 2.00  1.56
0203DDC270672510.50 009 1         88.86 2.00  1.56
0203DDC270672510.50 010 1         65.83 2.00  1.56
0203DDC270672520.50 001 1         27.72 2.00  1.82
0203DDC270672520.50 002 1         36.24 2.00  1.82
```

```
0203DDC270672520.50 003 1        36.45 2.00  1.82
0203DDC270672520.50 004 1        28.72 2.00  1.82
0203DDC270672520.50 005 1        24.24 2.00  1.82
0203DDC270672520.50 006 1        13.00 2.00  1.82
0203DDC270672520.50 007 1        25.00 2.00  1.82
0203DDC270672520.50 008 1        39.20 2.00  1.82
0203DDC270672520.50 009 1        35.39 2.00  1.82
0203DDC270672520.50 010 1        26.56 2.00  1.82
```

Aboveground Invertebrate Data

Aboveground invertebrate data collected in 1972 at the Bridger Site were recorded on Form NREL-30. These data are stored as Grassland Biome data set A2U30E3. A sample data form and an example of the data are attached.

IBP

GRASSLAND BIOME

U.S. INTERNATIONAL BIOLOGICAL PROGRAM

FIELD DATA SHEET - INVERTEBRATE

DATA TYPE	SITE	INITIALS	DATE			TREATMENT	REPLICATE	PLOT SIZE	QUADRAT	TROPHIC	HOST	ORDER	FAMILY	GENUS	SPECIES	SUBSPECIES	LIFE STAGE	TOTAL NO.	DRY WT.	NO. WEIGH
			Day	Mo	Yr															
1-2	3-4	5-7	8-9	10-11	12-13	14	15	[illegible]	20-21	22	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

DATA TYPE
- 01 Aboveground Biomass
- 02 Litter
- 03 Belowground Biomass
- 10 Vertebrate - Live Trapping
- 11 Vertebrate - Snap Trapping
- 12 Vertebrate - Collection
- 20 Avian Flush Census
- 21 Avian Road Count
- 22 Avian Road Count Summary
- 23 Avian Collection - Internal
- 24 Avian Collection - External
- 25 Avian Collection - Plumage
- 30 Invertebrate
- 40 Microbiology - Decomposition
- 41 Microbiology - Nitrogen
- 42 Microbiology - Biomass
- 43 Microbiology - Root Decomposition
- '4 Microbiology - Respiration

SITE
- 01 Ale
- 02 Bison
- 03 Bridger
- 04 Cottonwood
- 05 Dickinson
- 06 Hays
- 07 Hopland
- 08 Jornada
- 09 Osage
- 10 Pantex
- 11 Pawnee

TROPHIC
- 0 Unknown
- 1 Plant feeding (tissue)
- 2 Plant feeding (sap)
- 3 Plant feeding (pollen and nectar)
- 4 Plant feeding (seed)
- 5 Predator
- 6 Parasitoid
- 7 Parasite
- 8 Scavenger
- 9 Non-feeding stage

TREATMENT
- 1 Ungrazed
- 2 Lightly grazed
- 3 Moderately grazed
- 4 Heavily grazed
- 5 Grazed 1969, ungrazed 1970
- 6
- 7
- 8
- 9

LIFE STAGE
- 00 Undetermined
- 10 Adult
- 20 Pupae
- 30 Egg
- 40 Nymph or Larva
- 41 Nymph or Larva, early
- 42 Nymph or Larva, middle
- 43 Nymph or Larva, late
- 50 Instar
- 51 Instar, 1st
- 52 Instar, 2nd
- 53 Instar, 3rd

+++ EXAMPLE OF DATA +++

```
        1         2         3         4         5         6         7
12345678901234567890123456789012345678901234567890123456789012345678901

3003RSD24077211  .501         COLECURC        10      1
3003RSD24077211  .501         COLE            10      2
3003RSD24077211  .501         ORTHIETT        42      1
3003RSD24077211  .501         HYMEFORM        10      7
3003RSD24077211  .501         HEMIMIRI        10      2
3003RSD24077211  .501         COLE            40      3
3003RSD24077211  .501         HEMIPENT        40      1
3003RSD24077211  .502         HYMEFORM        10      7
3003RSD24077211  .502         HYME            10      2
3003RSD24077211  .502         COLECERA        10      2
3003RSD24077211  .502         COLECURC        10      1
3003RSD24077211  .502         COLECHRY        10      1
3003RSD24077211  .502         COLE            10      1
3003RSD24077211  .502         COLE            40      4
3003RSD24077211  .503         ORTHACRI        42      1
3003RSD24077211  .503         HYMEFORM        10      9
3003RSD24077211  .503         HOMOCICA        10      1
3003RSD24077211  .503         HEMIMIRI        10      1
3003RSD24077211  .503         LEPI            10      1
3003RSD24077211  .503         COLECHRY        10      2
3003RSD24077211  .503         COLE            40      0
3003RSD24077211  .503         LEPI            40      1
3003RSD24077211  .503         HEMIPENT        40      1
3003RSD24077211  .503         HOMOCICA        40      5
3003RSD24077211  .504         ORTHACRI        10      1
3003RSD24077211  .504         DIPT            10      1
3003RSD24077211  .504         HYMEFORM        10      1
3003RSD24077211  .504         COLECURC        10      1
3003RSD24077211  .504         ARAN            00      1
3003RSD24077211  .504         HOMOALEY        10      2
3003RSD24077211  .504         HOMOCICA        40      8
3003RSD24077211  .504         HEMIPENT        40      2
3003RSD24077211  .504         COLE            40      3
3003RSD24077211  .504         DIPT            40      1
3003RSD24077211  .505         ORTHIETT        42      1
3003RSD24077211  .505         ORTHACRI        41      1
3003RSD24077211  .505         HEMIMIRI        10      4
3003RSD24077211  .505         COLE            10      1
3003RSD24077211  .505         HYMEFORM        10      2
3003RSD24077211  .505         DIPT            10      2
3003RSD24077211  .505         HOMOCICA        10      1
3003RSD24077211  .505         HEMIPENT        40      3
3003RSD24077211  .505         LEPI            40      2
3003RSD24077211  .505         HOMOCICA        40      1
3003RSD24077211  .505         COLE            40      2
3003RSD24077211  .505         HYME            40      1
3003RSD24077211  .501         THYS            00     23
3003RSD24077211  .501         ACAR            00     24
3003RSD24077211  .502         THYS            00     14
3003RSD24077211  .502         ACAR            00      8
3003RSD24077211  .503         THYS            00     16
3003RSD24077211  .503         ACAR            00     49
3003RSD24077211  .504         THYS            00    108
3003RSD24077211  .504         ACAR            00     16
3003RSD24077211  .505         THYS            00     40
```

3003RSD24077211	.505	ACAR	00	11
3003RSD26077212	.501	DIPITABA	10	1
3003RSD26077212	.501	HYME	10	1
3003RSD26077212	.501	ORTHACRI	10	2
3003RSD26077212	.501	ORTHACRI	40	2
3003RSD26077212	.501	HYMEFORM	10	4
3003RSD26077212	.501	ARAN	00	2
3003RSD26077212	.501	HEMIMIRI	10	7
3003RSD26077212	.501	HEMINAHI	10	1
3003RSD26077212	.501	HOMOALEY	10	2
3003RSD26077212	.501	HEMI	10	5
3003RSD26077212	.501	HEMIPENT	40	8
3003RSD26077212	.501	HEMIMIRI	40	1
3003RSD26077212	.501	HOMOCICA	40	8
3003RSD26077212	.501	COLE	40	1
3003RSD26077212	.501	COLECHRY	10	3
3003RSD26077212	.501	COLECURC	10	1
3003RSD26077212	.501	THYS	00	32
3003RSD26077212	.501	ACAR	00	6
3003RSD26077212	.502	ORTHACRI	10	2
3003RSD26077212	.502	ORTHACRI	42	1
3003RSD26077212	.502	ORTHTETT	41	1
3003RSD26077212	.502	ARAN	00	1
3003RSD26077212	.502	DIPT	10	1
3003RSD26077212	.502	HYMEFORM	10	2
3003RSD26077212	.502	HEMIMIRI	10	14
3003RSD26077212	.502	HEMIPENT	40	2
3003RSD26077212	.502	HEMICORI	40	4
3003RSD26077212	.502	HOMOALEY	10	1
3003RSD26077212	.502	HOMOCICA	40	8
3003RSD26077212	.502	LEPI	40	1
3003RSD26077212	.502	THYS	00	56
3003RSD26077212	.502	ACAR	00	14
3003RSD26077212	.503	ORTHTETT	41	1
3003RSD26077212	.503	ORTHACRI	42	1
3003RSD26077212	.503	DIPT	10	1
3003RSD26077212	.503	ARAN	00	3
3003RSD26077212	.503	COLE	10	1
3003RSD26077212	.503	HOMOCICA	40	1
3003RSD26077212	.503	HYMEFORM	10	9
3003RSD26077212	.503	HEMIMIRI	10	15
3003RSD26077212	.503	HEMINAHI	10	1
3003RSD26077212	.503	HEMISCUT	40	2
3003RSD26077212	.503	HEMIPENT	40	4
3003RSD26077212	.503	HEMI	10	2
3003RSD26077212	.503	HEMI	40	3
3003RSD26077212	.503	LEPI	40	1
3003RSD26077212	.503	DIPT	40	8
3003RSD26077212	.503	THYS	00	32
3003RSD26077212	.503	ACAR	00	13
3003RSD26077212	.504	ORTHACRI	41	1
3003RSD26077212	.504	ORTHTETT	41	2
3003RSD26077212	.504	HYMEFORM	10	10
3003RSD26077212	.504	ARAN	00	4
3003RSD26077212	.504	HEMIMIRI	10	5
3003RSD26077212	.504	HEMINABI	10	1
3003RSD26077212	.504	HEMI	10	1
3003RSD26077212	.504	COLECARA	10	3
3003RSD26077212	.504	HOMOCICA	40	3
3003RSD26077212	.504	LEPI	40	1

3003RSD26077212	.504	COLE	40	2
3003RSD26077212	.504	DIPT	40	1
3003RSD26077212	.504	THYS	00	17
3003RSD26077212	.504	ACAR	00	8
3003RSD26077212	.505	ORTHACRI	10	2
3003RSD26077212	.505	HYMEFORM	10	11
3003RSD26077212	.505	ARAN	00	1
3003RSD26077212	.505	HOMOCICA	10	1
3003RSD26077212	.505	HOMOALEY	10	2
3003RSD26077212	.505	HEMICORI	40	1
3003RSD26077212	.505	HEMIMIRI	10	8
3003RSD26077212	.505	HEMIPENT	40	2
3003RSD26077212	.505	HEMI	40	8
3003RSD26077212	.505	COLECURC	10	1
3003RSD26077212	.505	COLE	40	1
3003RSD26077212	.505	THYS	00	446
3003RSD26077212	.505	ACAR	00	8
3003RSD24077221	.501	COLECHRY	10	1
3003RSD24077221	.501	COLESCAR	10	1
3003RSD24077221	.501	COLECARA	10	1
3003RSD24077221	.501	ARAN	00	1
3003RSD24077221	.501	HOMOCICA	10	2
3003RSD24077221	.501	DIPT	10	1
3003RSD24077221	.501	HEMINABI	10	1
3003RSD24077221	.501	HEMIMIRI	10	1
3003RSD24077221	.501	HEMIMIRI	40	2
3003RSD24077221	.501	HEMIPENT	40	2
3003RSD24077221	.502	ARAN	00	2
3003RSD24077221	.502	HEMIMIRI	10	2
3003RSD24077221	.502	HYMEFORM	10	6
3003RSD24077221	.502	COLECHRY	10	1
3003RSD24077221	.502	COLECARA	10	1
3003RSD24077221	.502	LEPI	40	1
3003RSD24077221	.502	HYME	40	1
3003RSD24077221	.502	HOMOCICA	40	1
3003RSD24077221	.503	ORTHACRI	41	1
3003RSD24077221	.503	HYMEFORM	10	4
3003RSD24077221	.503	COLECHRY	10	1
3003RSD24077221	.503	HEMICORI	40	2
3003RSD24077221	.503	HEMIMIRI	10	4
3003RSD24077221	.503	HEMIMIRI	40	1
3003RSD24077221	.503	HEMIPENT	40	3
3003RSD24077221	.503	HOMOCICA	40	4
3003RSD24077221	.503	LEPI	40	1
3003RSD24077221	.503	COLE	40	2
3003RSD24077221	.504	HYME	10	1
3003RSD24077221	.504	ARAN	00	1
3003RSD24077221	.504	DIPT	10	1
3003RSD24077221	.504	HEMICORI	40	6
3003RSD24077221	.504	COLECHRY	10	2
3003RSD24077221	.504	COLEELAT	10	1
3003RSD24077221	.504	HEMIMIRI	10	1
3003RSD24077221	.504	HOMOCICA	10	1
3003RSD24077221	.504	HOMO	40	8
3003RSD24077221	.504	DIPT	40	1
3003RSD24077221	.504	LEPI	40	1
3003RSD24077221	.505	ORTHACRI	10	1
3003RSD24077221	.505	COLEENTO	10	1

3003RSD24077221	.505	LEPI	10	1
3003RSD24077221	.505	DIPT	10	2
3003RSD24077221	.505	ARAN	00	1
3003RSD24077221	.505	HYMEFORM	10	11
3003RSD24077221	.505	COLECARA	10	1
3003RSD24077221	.505	COLECHRY	10	1
3003RSD24077221	.505	COLEANTH	10	1
3003RSD24077221	.505	HEMIPENT	40	4
3003RSD24077221	.505	HEMIMIRI	10	1
3003RSD24077221	.505	HOMOCICA	40	13
3003RSD24077221	.505	HEMI	40	1
3003RSD24077221	.505	LEPI	40	1
3003RSD24077221	.505	COLE	40	1
3003RSD24077221	.505	DIPT	40	4
3003RSD24077221	.501	THYS	00	29
3003RSD24077221	.501	ACAR	00	29
3003RSD24077221	.502	THYS	00	8
3003RSD24077221	.502	ACAR	00	24
3003RSD24077221	.503	THYS	00	31
3003RSD24077221	.503	ACAR	00	32
3003RSD24077221	.504	THYS	00	43
3003RSD24077221	.504	ACAR	00	31
3003RSD24077221	.505	THYS	00	126
3003RSD24077221	.505	ACAR	00	7
3003RSD26077222	.501	HYMEFORM	10	170
3003RSD26077222	.501	ARAN	00	1
3003RSD26077222	.501	COLECURC	10	1
3003RSD26077222	.501	COLECARA	10	2
3003RSD26077222	.501	DIPT	40	2
3003RSD26077222	.501	HYME	40	2
3003RSD26077222	.501	HEMI	40	1
3003RSD26077222	.501	THYS	00	47
3003RSD26077222	.501	ACAR	00	3
3003RSD26077222	.502	HYME	10	2
3003RSD26077222	.502	HYMEFORM	10	3
3003RSD26077222	.502	COLLENTO	10	1
3003RSD26077222	.502	LEPI	40	1
3003RSD26077222	.502	HEMIMIRI	10	1
3003RSD26077222	.502	HEMIPENT	40	1
3003RSD26077222	.502	HEMI	40	1
3003RSD26077222	.502	COLECURC	10	1
3003RSD26077222	.502	COLECARA	10	2
3003RSD26077222	.502	COLECHRY	10	1
3003RSD26077222	.502	THYS	00	26
3003RSD26077222	.502	ACAR	00	7
3003RSD26077222	.503	HYME	10	1
3003RSD26077222	.503	ARAN	00	1
3003RSD26077222	.503	HYMEFORM	10	1
3003RSD26077222	.503	HEMIPENT	40	3
3003RSD26077222	.503	HEMIMIRI	40	2
3003RSD26077222	.503	COLEELAT	10	1
3003RSD26077222	.503	COLECURC	10	1
3003RSD26077222	.503	COLECHRY	10	1
3003RSD26077222	.503	LEPI	40	1
3003RSD26077222	.503	COLE	40	4
3003RSD26077222	.503	THYS	00	17

3003RSD26077222	.503	ACAR	00	29
3003RSD26077222	.504	ORTHTETT	42	1
3003RSD26077222	.504	ORTHACRI	42	1
3003RSD26077222	.504	HOMOCICA	40	10
3003RSD26077222	.504	ARAN	00	2
3003RSD26077222	.504	HYMEFORM	10	4
3003RSD26077222	.504	HOMOCICA	10	1
3003RSD26077222	.504	HEMICORI	40	2
3003RSD26077222	.504	HEMIMIRI	40	2
3003RSD26077222	.504	COLECORC	10	2
3003RSD26077222	.504	COLECHRY	10	1
3003RSD26077222	.504	HYME	40	1
3003RSD26077222	.504	COLE	40	1
3003RSD26077222	.504	THYS	00	93
3003RSD26077222	.504	ACAR	00	9
3003RSD26077222	.505	ARAN	00	1
3003RSD26077222	.505	HYMEFORM	10	7
3003RSD26077222	.505	DIPT	10	3
3003RSD26077222	.505	HOMOCICA	10	2
3003RSD26077222	.505	HOMOCICA	40	15
3003RSD26077222	.505	HEMIMIRI	10	6
3003RSD26077222	.505	HEMIMIRI	40	2
3003RSD26077222	.505	HEMIPENT	40	1
3003RSD26077222	.505	HEMICORI	40	1
3003RSD26077222	.505	LEPI	40	1
3003RSD26077222	.505	THYS	00	135
3003RSD26077222	.505	ACAR	00	11

Soil Microarthropod Data

Soil microarthropod data collected at the Bridger Site were recorded on Form NREL-37. These data are stored as Grassland Biome data set A2U30L3. A sample data form and a listing of the data are attached.

IBP

GRASSLAND BIOME

U.S. INTERNATIONAL BIOLOGICAL PROGRAM

FIELD DATA SHEET--MICROARTHROPOD CORES

Data Type	Site	Initials	Date Day	Date Month	Date Year	Treatment	Replicate	Core Diameter	Quadrat	Trophic Level	Top Depth	Bottom Depth	Class	Order	Suborder	Family	Genus	Species	Life Stage	Total Number
1-2	3-4	5-7	8-9	10-11	12-13	14	15	16-18	20-22	24	25-26	27-28	29-32	33-37	39-42	44-47	49-52	54-57	59-60	62-65
37																				

Site
01 ALE
02 Bison
03 Bridger
04 Cottonwood
05 Dickinson
06 Hays
07 Annual
08 Jornada
09 Osage
10 Pantex
11 Pawnee
12

Trophic Level
0 Unknown
1 Plant feeding (tissue)
2 Plant feeding (sap)
3 Plant feeding (pollen & nectar)
4 Plant feeding (seed)
5 Predator
6 Parasite or parasitoid
7 Omnivore
8 Scavenger
9 Non-feeding stage
A Root feeding (tissue)
B Root feeding (sap)

Treatment
1 Ungrazed
2 Lightly grazed
3 Moderately grazed
4 Heavily grazed
5 Ungrazed current year only
A Diet light
B Diet moderate
C Diet heavy
D ESA - 0
E ESA - W
F ESA - N
G ESA - WN

Life Stage
00 Undetermined
10 Adult
11 Adult male
12 Adult female
20 Pupa
30 Egg
31 Egg case
32 Egg case, with eggs
33 Egg case, with nymphs
40 Nymph or larva
41 Nymph or larva, early
42 Nymph or larva, middle
43 Nymph or larva, late
50 Instar
51 Instar, 1st
52 Instar, 2nd
533 Instar, 3rd
54 Instar, 4th
55 Instar, 5th
56 Instar, 6th
57 Instar, 7th

+++ LISTING OF DATA +++

```
         1         2         3         4         5         6
1234567890123456789012345678901234567890123456789012345678901234
```

1003BMH1608723	2.76	PEMA	0	3	36		9	22	6	8	3
1003BMH1608723	2.76	PEMA	0	3	60		6	20	0	7	12
1003BMH1608723	2.76	PEMA	0	3	140		9	26	0	7	2
1003BMH1608723	2.76	PEMA	0	3	12	6		18	0	7	1
1003BMH1608723	2.76	PEMA	0	3	61		1	12	0	6	2
1003BMH1608723	2.76	PEMA	0	3	41		0	19	0	5	8
1003BMH1608723	2.76	PEMA	0	3	62	6		23	0	4	2
1003BMH1608723	2.76	PEMA	0	3	42		9	26	0	2	7
1003BMH1608723	2.76	PEMA	0	3	43	6		25	0	6	1
1003BMH1608723	2.76	PEMA	0	3	20		6	23	0	1	1
1003BMH1608723	2.76	PEMA	0	3	39		0	16	0	11	1
1003BMH1708723	2.76	PEMA	0	3	36		9	20	0	9	1
1003BMH1708723	2.76	PEMA	0	3	140		9	30	0	7	3
1003BMH1708723	2.76	PEMA	0	3	60		9	24	0	7	12
1003BMH1708723	2.76	FEMA	1	1					6	4	9
1003BMH1708723	2.76	PEMA	0	3	41		0	16	0	2	9
1003BMH1708723	2.76	PEMA	0	3	43	6		14	0	1	7
1003BMH1708723	2.76	PEMA	0	3	20		6	20	0	1	3
1003BMH1808723	2.76	PEMA	0	3	39		0	15	0	10	1
1003BMH1808723	2.76	PEMA	0	3	60		9	23	0	7	12
1003BMH1808723	2.76	PEMA	0	3	64		9	26	0	7	11
1003BMH1808723	2.76	PEMA	0	3	11	6		15	0	7	5
1003BMH1808723	2.76	PEMA	0	3	140		9	27	0	6	3
1003BMH1808723	2.76	PEMA	0	3	20		6	23	0	2	3
1003BMH1808723	2.76	PEMA	0	3	43	6		19	0	2	5
1003BMH1808723	2.76	PEMA	0	3	42		9	24	0	2	7
1003BMH1908723	2.76	MIMO	3	3	100		0		0	12	11
1003BMH1908723	2.76	PEMA	0	3	39		0	15	6	10	1
1003BMH1908723	2.76	PEMA	0	3	12	6		18	0	8	3
1003BMH1908723	2.76	PEMA	0	3	60		9	25	0	7	12
1003BMH1908723	2.76	PEMA	0	3	64		9	26	6	7	11
1003BMH1908723	2.76	PEMA	0	3	140		9	22	6	6	3
1003BMH1908723	2.76	PEMA	0	3	11	6		21	0	5	6
1003BMH1908723	2.76	PEMA	0	3	62	6		21	0	4	11
1003BMH2008723	2.76	PEMA	3	3	39		0	17	6	10	1
1003BMH2008723	2.76	PEMA	3	3	14	6		21	0	7	12
1003BMH2008723	2.76	PEMA	0	3	140		9		0	6	5
1003BMH2008723	2.76	PEMA	3	3	11	6		16	0	7	5
1003BMH2008723	2.76	PEMA	0	3	41		9		0	2	9
1003BMH0608721	2.76	MIMO	3	3	4		6		0	3	1
1003BMH0608721	2.76	MIMO	2	3	1		9		0	10	2
1003BMH0608721	2.76	MIMO	3	3	5		9		0	9	2
1003BMH0608721	2.76	MIMO	3	3	6		0		0	8	6
1003BMH0608721	2.76	PEMA	3	1			0		0	12	10
1003BMH0608721	2.76	PEMA	0	3	10		6		0	12	11
1003BMH0608721	2.76	PEMA	3	3	6	6			0	10	11
1003BMH0608721	2.76	PEMA	3	3	11		9		0	9	12
1003BMH0608721	2.76	PEMA	0	3	5	0			0	9	12
1003BMH0608721	2.76	PEMA	3	3	3		0		0	8	11
1003BMH0608721	2.76	PEMA	3	3	7		6		0	2	12
1003BMH0608721	2.76	MIMO	3	3	7	6			0	8	12
1003BMH0708721	2.76	MIMO	0	3	2		9	31	0	3	1
1003BMH0708721	2.76	PEMA	0	3	9		9	23	0	2	9
1003BMH0708721	2.76	PEMA	0	3	1	6		16	0	12	10
1003BMH0708721	2.76	PEMA	0	3	12	6		16	0	12	11

1003BMH0708721	2.76	PEMA	1	1		2		14	0	10	11
1003BMH0708721	2.76	PEMA	3	3	30	2		13	0	10	11
1003BMH0708721	2.76	PEMA	0	3	5	0		17	0	7	12
1003BMH0708721	2.76	PEMA	0	3	4	3		13	0	1	12
1003BMH0808721	2.76	PEMA	3	3	10		0	22	0	12	11
1003BMH0808721	2.76	PEMA	0	3	31	1		13	0	10	11
1003BMH0808721	2.76	PEMA	3	3	5	0		14	0	7	12
1003BMH0808721	2.76	PEMA	0	3	4	6		13	0	1	12
1003BMH0808721	2.76	PEMA	0	3	9		6	20	0	2	10
1003BMH0808721	2.76	MIMO	0	3	10		9	39	0	2	11
1003BMH0808721	2.76	ZAPR	0	3	4		9	32	0	9	6
1003BMH0808721	2.76	MIMO	0	3	2		0	35	0	3	1
1003BMH0908721	2.76	MUFR	1	1					6	2	9
1003BMH0908721	2.76	PEMA	0	3	12	6			0	12	10
1003BMH0908721	2.76	PEMA	0	3	1	6			0	10	11
1003BMH1008721	2.76	MIMO	3	3	11		9	35	0	9	9
1003BMH0108723	2.76	PEMA	0	3	36		1	18.	0	9	3
1003BMH0108723	2.76	PEMA	0	3	37	0		22	0	8	1
1003BMH0108723	2.76	PEMA	0	3	12	6		20	0	8	1
1003BMH0108723	2.76	PEMA	0	3	11	6		22	0	7	6
1003BMH0108723	2.76	PEMA	0	3	38	0		18	0	4	1
1003BMH0108723	2.76	PEMA	0	3	19	6		21	0	4	10
1003BMH0108723	2.76	PEMA	0	3	20		9	24	0	1	2
1003BMH0208723	2.76	MUFR	0	1					6	12	2
1003BMH0208723	2.76	PEMA	0	3	12	6			0	9	1
1003BMH0208723	2.76	PEMA	0	3	39		0		0	9	1
1003BMH0208723	2.76	PEMA	0	3	32	0			0	8	1
1003BMH0208723	2.76	PEMA	0	3	17	6			0	8	11
1003BMH0208723	2.76	PEMA	0	3	19	6			0	7	11
1003BMH0208723	2.76	PEMA	0	3	140		0		0	7	6
1003BMH0208723	2.76	PEMA	0	3	11	6			0	4	9
1003BMH0208723	2.76	PEMA	0	3	41		1		0	4	9
1003BMH0208723	2.76	PEMA	0	3	14	6			0	2	5
1003BMH0208723	2.76	PEMA	0	3	20		9		0	1	3
1003BMH0308723	2.76	PEMA	0	3	140		0	17	0	7	6
1003BMH0308723	2.76	PEMA	0	3	11	6		25	0	4	10
1003BMH0308723	2.76	PEMA	0	3	20		9	25	0	1	3
1003BMH0408723	2.76	PEMA	0	3	20		9		6	1	3
1003BMH0408723	2.76	PEMA	0	3	19	6		21	6	6	12
1003BMH0408723	2.76	PEMA	0	3	140		0	17	6	7	6
1003BMH0408723	2.76	PEMA	0	3	12	6		20	6	8	1
1003BMH0508723	2.76	PEMA	0	3	12	6			6	9	2
1003BMH0508723	2.76	PEMA	0	3	37	1			6	8	1
1003BMH0508723	2.76	PEMA	0	3	19	4			6	7	12
1003BMH0508723	2.76	PEMA	0	3	11	6			6	4	9
1003BMH0508723	2.76	PEMA	0	3	42		1		6	3	7
1003BMH0508723	2.76	PEMA	0	3	43	6			6	2	7
1003BMH0508723	2.76	PEMA	0	3	20		9		6	1	3
1003BMH2108721	2.76	MIMO	0	3	20		9	45	0	5	5
1003BMH2108721	2.76	PEMA	0	3	60	0		16	2	9	5
1003BMH2108721	2.76	MIMO	3	3	21		0	25	0	3	10
1003BMH2108721	2.76	PEMA	0	3	9		9	27	4	2	11
1003BMH2108721	2.76	PEMA	0	3	61		2	9	0	4	11
1003BMH2108721	2.76	PEMA	0	3	43	2		12	0	6	11
1003BMH2108721	2.76	PEMA	0	3	62		1	12	0	7	11
1003BMH2108721	2.76	PEMA	0	3	12	0		14	0	12	12
1003BMH2108721	2.76	PEMA	0	3	63		2	8	0	12	12
1003BMH2108721	2.76	PEMA	0	3	64	2		11	0	10	12
1003BMH2108721	2.76	PEMA	0	3	4	0		16	0	3	12

1003BMH2208721	2.76	MIMO	0	3	22		0	24	0	4	7
1003BMH2208721	2.76	PEMA	0	3	65	1		13	0	2	7
1003BMH2208721	2.76	PEMA	0	3	66		0	17	0	3	12
1003BMH2208721	2.76	PEMA	0	3	31	0		17	0	10	12
1003BMH2208721	2.76	PEMA	0	3	8	0		15	0	10	10
1003BMH2208721	2.76	PEMA	0	3	12	0		17	0	12	12
1003BMH2208721	2.76	PEMA	3	3	64	2		11	0	10	10
1003BMH2208721	2.76	MIMO	0	3	23		9	41	0	11	12
1003BMH2308721	2.76	MIMO	0	3	24		1		6	9	2
1003BMH2308721	2.76	MIMO	0	3	25		1		0	1	3
1003BMH2308721	2.76	MIMO	0	3	26		2		6	5	5
1003BMH2308721	2.76	MIMO	0	3	27		6		0	5	8
1003BMH2308721	2.76	MIMO	0	3	28	6			6	3	10
1003BMH2308721	2.76	PEMA	0	3	67	1			6	12	12
1003BMH2408721	2.76	MUFR	1	1					6	3	3
1003BMH2408721	2.76	MIMO	3	3	29	1		20	0	2	5
1003BMH2408721	2.76	MIMO	0	3	23		9	46	0	10	12
1003BMH2508721	2.76	MIMO	0	3	27		0	26	0	5	8
1003BMH2508721	2.76	MIMO	0	3	28	6		42	0	3	11
1003BMH2508721	2.76	MIMO	0	3	30	0		29	0	11	12
1003BMH1207721	2.76	PEMA	0	3	2	6		20	0	3	8
1003BMH1207721	2.76	PEMA	0	3	3		3	17	0	12	11
1003BMH1207721	2.76	PEMA	0	3	4	6		16	0	1	12
1003BMH1207721	2.76	PEMA	0	3	5	0		16	0	7	12
1003BMH1207721	2.76	PEMA	0	3	6	6		24	0	12	12
1003BMH1307721	2.76	PEMA	0	3	1	6			0	10	1
1003BMH1307721	2.76	PEMA	0	3	7		9		0	3	8
1003BMH1307721	2.76	PEMA	0	3	3		3		0	9	8
1003BMH1307721	2.76	PEMA	0	3	8	2		8	0	11	9
1003BMH1307721	2.76	PEMA	0	3	9		6	22	0	12	10
1003BMH1307721	2.76	PEMA	0	3	6	6			0	12	10
1003BMH1307721	2.76	PEMA	0	3	10		9	28	0	12	11
1003BMH1307721	2.76	PEMA	0	3	4	6			0	3	12
1003BMH1307721	2.76	PEMA	0	3	11		3	20	0	7	12
1003BMH1307721	2.76	PEMA	0	3	12	6		20	0	12	12
1003BMH1207721	2.76	PEMA	0	3	1	6		24	0	10	1
1003BMH1407721	2.76	PEMA	0	3	2	6			0	2	7
1003BMH1407721	2.76	PEMA	0	3	7		9	21	0	4	8
1003BMH1407721	2.76	PEMA	0	3	1	6			0	11	9
1003BMH1407721	2.76	PEMA	0	3	9		9	22	0	2	10
1003BMH1407721	2.76	PEMA	0	3	3		3		0	10	11
1003BMH1407721	2.76	PEMA	0	3	13	6		23	0	1	12
1003BMH1407721	2.76	PEMA	0	3	14	6		18	0	7	12
1003BMH1407721	2.76	PEMA	0	3	12	6			0	12	12
1003BMH1507721	2.76	PEMA	0	3	1	6			0	9	8
1003BMH1507721	2.76	PEMA	0	3	10		9	31	0	12	11
1003BMH1507721	2.76	PEMA	0	3	6	6			0	12	12
1003BMH1507721	2.76	PEMA	0	3	14	6		19	0	7	12
1003BMH1607721	2.76	MIMO	0	3	1		9	30	0	10	1
1003BMH1607721	2.76	MIMO	0	3	2		3	20	0	3	1
1003BMH1607721	2.76	MIMO	0	3	3	6		23	0	3	1
1003BMH1607721	2.76	PEMA	0	3	7		9		0	4	8
1003BMH1607721	2.76	PEMA	3	3	2	6			0	6	6
1003BMH1607721	2.76	ZAPR	0	3	1		9	24	0	2	6
1003BMH1607721	2.76	ZAPR	0	3	2		9	26	0	3	7
1003BMH1607721	2.76	PEMA	3	3	14	6			0	7	12
1003BMH1607721	2.76	PEMA	0	3	6	6			0	12	12
1003BMH1607721	2.76	PEMA	0	3	15	6		24	0	12	12

1003BMH1607721	2.76	PEMA	0	3	1	6			0	10	12
1003BMH0507723	2.76	PEMA	0	3	1	6		23	0	7	12
1003BMH0507723	2.76	PEMA	0	1			1	18	0	1	5
1003BMH0507723	2.76	MIMO	0	3	1		6	41	0	1	4
1003BMH0507723	2.76	PEMA	0	3	2		2	11	0	4	1
1003BMH0507723	2.76	PEMA	0	3	3		1	18	0	5	10
1003BMH0507723	2.76	PEMA	0	3	4	6		21	0	7	6
1003BMH0507723	2.76	PEMA	0	3	5	6		24	0	7	1
1003BMH0507723	2.76	PEMA	0	3	6	6			0	8	3
1003BMH0507723	2.76	PEMA	0	3	7		9	28	0	10	33
1003BMH0607723	2.76	PEMA	0	3	8		3	25	0	7	1
1003BMH0607723	2.76	PEMA	0	3	9	6		22	0	1	1
1003BMH0607723	2.76	PEMA	0	3	10	6		21	0	2	9
1003BMH0607723	2.76	PEMA	0	3	11	6		17	0	3	12
1003BMH0607723	2.76	PEMA	0	3	3		1	16	0	5	8
1003BMH0607723	2.76	PEMA	0	3	1	6		20	0	6	12
1003BMH0607723	2.76	PEMA	0	3	4	6			0	7	10
1003BMH0607723	2.76	PEMA	0	3	6	6		22	0	9	6
1003BMH0707723	2.76	PEMA	0	3	4	6			6	7	12
1003BMH0707723	2.76	PEMA	3	3	1	6		18	0	6	12
1003BMH0707723	2.76	PEMA	0	3	10	6			6	1	10
1003BMH0707723	2.76	PEMA	0	3	8		9		6	2	1
1003BMH0707723	2.76	PEMA	0	3	5	6			6	4	8
1003BMH0707723	2.76	PEMA	0	3	3		1		6	4	8
1003BMH0707723	2.76	PEMA	0	3	6	6			6	7	6
1003BMH0707723	2.76	PEMA	0	3	7		3		6	7	1
1003BMH0707723	2.76	PEMA	0	3	12	6		17		8	1
1003BMH0807723	2.76	PEMA	0	3	12	6			6	8	1
1003BMH0807723	2.76	PEMA	0	3	9	6			6	3	1
1003BMH0807723	2.76	PEMA	0	3	5	6			6	3	2
1003BMH0807723	2.76	PEMA	3	3	8		9		0	3	2
1003BMH0807723	2.76	PEMA	0	3	13	6		22	0	1	1
1003BMH0807723	2.76	PEMA	0	3	14	6		21	0	1	3
1003BMH0807723	2.76	PEMA	0	3	15	6		23	0	1	7
1003BMH0807723	2.76	MIMO	0	3	1		6	38	6	1	4
1003BMH0807723	2.76	PEMA	0	3	10	6			6	3	10
1003BMH0807723	2.76	PEMA	0	3	11	6			6	3	12
1003BMH0807723	2.76	PEMA	0	3	4	6			6	4	6
1003BMH0807723	2.76	PEMA	3	3	3		1			5	8
1003BMH0807723	2.76	PEMA	1	1		6		17	0	7	12
1003BMH0807723	2.76	PEMA	1	1		6		18	0	7	12
1003BMH0807723	2.76	PEMA	1	1		6		24	6	11	8
1003BMH0807723	2.76	PEMA	3	3	7		3	22	0	12	22
1003BMH0907723	2.76	PEMA	0	3	12	6			6	11	1
1003BMH0907723	2.76	PEMA	0	3	6	6			6	11	8
1003BMH0907723	2.76	PEMA	2	3	16	6			0	7	12
1003BMH0907723	2.76	PEMA	0	3	17	6		18	0	7	11
1003BMH0907723	2.76	PEMA	3	3	18	6			0	6	6
1003BMH0907723	2.76	PEMA	0	3	14	6			0	5	6
1003BMH0907723	2.76	PEMA	0	3	5	6			6	2	3
1003BMH0907723	2.76	PEMA	2	3	10	6			6	2	9
1003BMH0907723	2.76	PEMA	0	3	11	6			0	3	11
1003BMH0907723	2.76	PEMA	0	3	19	6			0	3	12
1003BMH0907723	2.76	PEMA	0	3	15	6			0	1	7
1003BMH0907723	2.76	PEMA	3	3	9	6			0	1	1

Small Mammal Live Trapping Data, Grids

Small mammal live trapping data collected on grids at the Bridger Site were recorded on Form NREL-10. Data collected in 1970 are stored as Grassland Biome data set A2U1003; 1972 data are stored as Grassland Biome data set A2U10B3; 1973 data are stored as Grassland Biome data set A2U10F3. A sample data form and a listing of the 1972 data are attached.

IBP

GRASSLAND BIOME

U.S. INTERNATIONAL BIOLOGICAL PROGRAM

FIELD DATA SHEET - VERTEBRATE - LIVE TRAPPING

DATA TYPE	SITE	INITIALS	DATE			TREATMENT	REPLICATE	PLOT SIZE	[illegible]	SPECIES	SUBSPECIES	CONDITION	[illegible]	NUMBER	[illegible]	[illegible]	[illegible]	[illegible]	LOCATION		PREVIOUS NO.
			Day	Mo	Yr														[illegible]	[illegible]	

DATA TYPE
- 01 Aboveground Biomass
- 02 Litter
- 03 Belowground Biomass
- 10 Vertebrate - Live Trapping
- 11 Vertebrate - Snap Trapping
- 12 Vertebrate - Collection
- 20 Avian Flush Census
- 21 Avian Road Count
- 22 Avian Road Count Summary
- 23 Avian Collection - Internal
- 24 Avian Collection - External
- 25 Avian Collection - Plumage
- 30 Invertebrate
- 40 Microbiology - Decomposition
- 41 Microbiology - Nitrogen
- 42 Microbiology - Biomass
- 43 Microbiology - Root Decomposition
- 4 Microbiology - Respiration

SITE
- 01 Ale
- 02 Bison
- 03 Bridger
- 04 Cottonwood
- 05 Dickinson
- 06 Hays
- 07 Hopland
- 08 Jornada
- 09 Osage
- 10 Pantex
- 11 Pawnee

TREATMENT
- 1 Ungrazed
- 2 Lightly grazed
- 3 Moderately grazed
- 4 Heavily grazed
- 5 Grazed 1969, ungrazed 1970
- 6
- 7
- 8
- 9

MALE
- 0 Adult, non-breeding
- 1 Subadult, non-breeding
- 2 Juvenile, non-breeding
- Adult breeding ?
- Subadult breeding ?
- 5 Juvenile breeding ?
- 6 Adult breeding
- 7 Subadult breeding
- 8 Juvenile breeding
- 9 Undetermined

FEMALE
- 0 Adult, vulva inactive
- 1 Subadult, vulva inactive
- 2 Juvenile, vulva inactive
- 3 Adult, vulva turgid
- 4 Subadult, vulva turgid
- 5 Juvenile, vulva turgid
- 6 Adult, vulva cornified
- 7 Subadult, vulva cornified
- 8 Juvenile, vulva cornified
- 9 Pregnant

CONDITION
- 0 Normal
- 1 Escaped
- 2 Torpid
- 3 Dead

MOLT
- 0 No evidence
- 1 Post-juvenile
- 2 Post-subadult
- 3 Adult (vernal)
- 4 Adult (autumnal)
- 5 Molt of unknown stage
- 6 Undetermined

MARK
- 0 Normal
- 1 Unmarked
- 2 Ear tag
- 3 Toe Clip
- 4 Ear tag and toe clip
- 5 Natural amputation

*** LISTING OF DATA ***

```
         1         2         3         4         5         6         7
1234567890123456789012345678901234567890123456789012345678901234567890l

3703RSD10077211.05 001   0510ARACACAR                       00   23
3703RSD10077211.05 001   0510INSECOLL        PODU           40    2
3703RSD10077211.05 001   0005ARACACAR                       00   26
3703RSD10077211.05 001   0005INSECOLL        ENTO           40    6
3703RSD10077211.05 001   0005INSECOLL        PODU           40    6
3703RSD10077211.05 002   0510ARACACAR                       00    8
3703RSD10077211.05 002   0510INSECOLL        PODU           40    1
3703RSD10077211.05 002   0005INSECOLE                       40    1
3703RSD10077211.05 002   0005ARACACAR                       00   38
3703RSD10077211.05 002   0005INSECOLL        ENTO           40    2
3703RSD10077211.05 003   0510ARACACAR                       00    2
3703RSD10077211.05 003   0005ARACACAR                       00   32
3703RSD10077211.05 003   0005INSECOLE                       40    1
3703RSD10077211.05 003   0005INSEHYME                       10    1
3703RSD10077211.05 003   0005INSECOLL        ENTO           40    6
3703RSD10077211.05 003   0005INSECOLL        PODU           40   10
3703RSD10077211.05 004   0510ARACACAR                       00    2
3703RSD10077211.05 004   0005INSECOLL        ENTO           40    7
3703RSD10077211.05 004   0005INSECOLL        PODU           40    5
3703RSD10077211.05 004   0005ARACACAR                       00   19
3703RSD10077211.05 005   0510ARACACAR                       00    6
3703RSD10077211.05 005   0005ARACACAR                       00   16
3703RSD10077211.05 005   0005INSECOLL        ENTO           40    1
3703RSD10077211.05 005   0005INSEHOMO        CICA           40    1
3703RSD12077212.05 001   0510ARACACAR                       00    6
3703RSD12077212.05 001   0005ARACACAR                       00   79
3703RSD12077212.05 001   0005INSECOLL        ENTO           40    1
3703RSD12077212.05 001   0005INSEHEMI                       40    1
3703RSD12077212.05 002   0510ARACACAR                       00   28
3703RSD12077212.05 002   0005ARACACAR                       00   86
3703RSD12077212.05 002   0005INSECOLL        PODU           40    4
3703RSD12077212.05 002   0005INSECOLL        ENTO           40    1
3703RSD12077212.05 003   0510INSEHYME        FORM           10    3
3703RSD12077212.05 003   0510ARACACAR                       00   34
3703RSD12077212.05 003   0510INSECOLL        ENTO           40    1
3703RSD12077212.05 003   0510INSECOLL        PODU           40    1
3703RSD12077212.05 003   0005ARACACAR                       00   37
3703RSD12077212.05 003   0005INSECOLL        PODU           40    4
3703RSD12077212.05 003   0005INSECOLL        ENTO           40    5
3703RSD12077212.05 004   0510ARACACAR                       00    2
3703RSD12077212.05 004   0005ARACACAR                       00   59
3703RSD12077212.05 004   0005INSETHYS                       10    1
3703RSD12077212.05 004   0005INSECOLE                       40    1
3703RSD12077212.05 005   0510ARACACAR                       00    1
3703RSD12077212.05 005   0005ARACACAR                       00   85
3703RSD12077212.05 005   0005INSECOLL        ENTO           40    1
3703RSD10077221.05 001   0510ARACACAR                       00    9
3703RSD10077221.05 001   0005INSEHOMO        PHYL           40   38
3703RSD10077221.05 001   0005ARACACAR                       00   61
3703RSD10077221.05 002   0510ARACACAR                       00   19
3703RSD10077221.05 002   0510INSECOLL        ENTO           40    3
3703RSD10077221.05 002   0510INSECOLL        PODU           40    1
3703RSD10077221.05 002   0005ARACACAR                       00   30
3703RSD10077221.05 002   0005INSECOLE                       40    2
3703RSD10077221.05 002   0005INSECOLL        PODU           40    1
```

3703RSD10077221.05	002	0005INSECOLL	ENTO	40	1
3703RSD10077221.05	003	0510ARACACAR		00	15
3703RSD10077221.05	003	0005ARACACAR		00	64
3703RSD10077221.05	003	0005INSECOLL	PODU	40	5
3703RSD10077221.05	003	0005INSECOLL	ENTO	40	5
3703RSD10077221.05	004	0510INSECOLL	ENTO	40	9
3703RSD10077221.05	004	0510ARACACAR		00	3
3703RSD10077221.05	004	0005ARACACAR		00	74
3703RSD10077221.05	004	0005INSETHYS		40	1
3703RSD10077221.05	004	0005INSECOLL	ENTO	40	10
3703RSD10077221.05	004	0005INSEHOMO		40	1
3703RSD10077221.05	004	0005INSECOLE		40	1
3703RSD10077221.05	005	0510ARACACAR		00	11
3703RSD10077221.05	005	0005ARACACAR		00	44
3703RSD10077221.05	005	0005INSECOLL	ENTO	40	1
3703RSD10077221.05	005	0005INSECOLE		40	1
3703RSD12077222.05	001	0510ARACACAR		00	18
3703RSD12077222.05	001	0005ARACACAR		00	48
3703RSD12077222.05	002	0510ARACACAR		00	25
3703RSD12077222.05	002	0005ARACPSEU		10	1
3703RSD12077222.05	002	0005ARACACAR		00	92
3703RSD12077222.05	002	0005INSECOLL	PODU	40	4
3703RSD12077222.05	003	0510ARACACAR		00	9
3703RSD12077222.05	003	0005ARACACAR		00	73
3703RSD12077222.05	004	0510ARACACAR		00	18
3703RSD12077222.05	004	0510INSECOLL	ENTO	40	2
3703RSD12077222.05	004	0005INSECOLL	ENTO	10	2
3703RSD12077222.05	004	0005ARACACAR		00	121
3703RSD12077222.05	004	0005INSECOLL	ENTO	40	8
3703RSD12077222.05	004	0005INSECOLL	PODU	40	4
3703RSD12077222.05	005	0510ARACACAR		00	4
3703RSD12077222.05	005	0005ARACACAR		00	33
3703RSD12077222.05	005	0005INSEDIPT		10	1
3703RSD24077211.05	001	0510ARACACAR		00	51
3703RSD24077211.05	001	0510INSECOLL	ENTO	40	1
3703RSD24077211.05	001	0005ARACACAR		00	84
3703RSD24077211.05	001	0005INSECOLL	ENTO	40	2
3703RSD24077211.05	001	0005INSECOLE		40	1
3703RSD24077211.05	002	0510ARACACAR		00	51
3703RSD24077211.05	002	0005INSECOLL	ENTO	40	1
3703RSD24077211.05	002	0005ARACACAR		00	5
3703RSD24077211.05	003	0510ARACACAR		00	17
3703RSD24077211.05	003	0510INSECOLL		40	2
3703RSD24077211.05	003	0005ARACACAR		00	88
3703RSD24077211.05	003	0005INSECOLL	ENTO	40	1
3703RSD24077211.05	004	0510ARACACAR		00	12
3703RSD24077211.05	004	0005INSECOLL	ENTO	40	3
3703RSD24077211.05	004	0005ARACACARAN		00	14
3703RSD24077211.05	005	0510ARACACARAN		00	5
3703RSD24077211.05	005	0510INSECOLL	PODU	40	2
3703RSD24077211.05	005	0005ARACACARAN		00	24
3703RSD24077211.05	005	0005INSECOLE		40	1
3703RSD26077212.05	001	0510ARACACAR		00	8
3703RSD26077212.05	001	0510INSECOLL	ENTO	40	3
3703RSD26077212.05	001	0005ARACACAR		00	7
3703RSD26077212.05	001	0005INSECOLL	ENTO	40	2
3703RSD26077212.05	002	0510ARACACAR		00	20
3703RSD26077212.05	002	0510INSECOLL		40	1
3703RSD26077212.05	002	0005ARACACAR		00	44

3703RSD26077212.05	002	0005INSECOLL	PODU	40	1
3703RSD26077212.05	002	0005INSECOLL	ENTO	40	1
3703RSD26077212.05	003	0510INSECOLL	ENTO	40	9
3703RSD26077212.05	003	0510ARACACAR		00	3
3703RSD26077212.05	003	0005ARACACAR		00	8
3703RSD26077212.05	003	0005INSECOLL	ENTO	40	3
3703RSD26077212.05	004	0510ARACACAR		00	4
3703RSD26077212.05	004	0510INSECOLL	ENTO	40	1
3703RSD26077212.05	004	0005ARACACAR		00	25
3703RSD26077212.05	004	0005INSECOLL	PODU	40	2
3703RSD26077212.05	004	0005INSECOLL	ENTO	40	1
3703RSD26077212.05	005	0510ARACACAR		00	04
3703RSD26077212.05	005	0510INSECOLL	ENTO	40	3
3703RSD26077212.05	005	0005ARACACAR		00	47
3703RSD24077221.05	001	0510ARACACAR		00	12
3703RSD24077221.05	001	0510INSECOLL	PODU	40	1
3703RSD24077221.05	001	0005ARACACAR		00	04
3703RSD24077221.05	001	0005INSECOLL	PODU	40	1
3703RSD24077221.05	002	0510ARACACAR		00	3
3703RSD24077221.05	002	0005ARACACAR		00	20
3703RSD24077221.05	003	0510ARACACAR		00	2
3703RSD24077221.05	003	0510INSECOLL	ENTO	40	1
3703RSD24077221.05	003	0005ARACACAR		00	26
3703RSD24077221.05	004	0510ARACACAR		00	3
3703RSD24077221.05	004	0510INSECOLL	ENTO	40	1
3703RSD24077221.05	004	0005ARACACAR		00	16
3703RSD24077221.05	004	0005INSECOLL	ENTO	40	1
3703RSD24077221.05	005	0510INSETHYS		40	1
3703RSD24077221.05	005	0510ARACACAR		00	1
3703RSD24077221.05	005	0005ARACACAR		00	10
3703RSD24077221.05	005	0005INSEHYME	FORM	10	1
3703RSD26077222.05	001	0510ARACACAR		00	12
3703RSD26077222.05	001	0510INSECOLL	PODU	40	1
3703RSD26077222.05	001	0005ARACACAR		00	38
3703RSD26077222.05	001	0005INSECOLL	PODU	40	05
3703RSD26077222.05	002	0510ARACACAR		00	15
3703RSD26077222.05	002	0510INSECOLE	STAP	10	2
3703RSD26077222.05	002	0005ARACACAR		00	77
3703RSD26077222.05	002	0005INSECOLL	ENTO	40	6
3703RSD26077222.05	003	0510ARACACAR		00	9
3703RSD26077222.05	003	0005ARACACAR		00	39
3703RSD26077222.05	003	0005INSECOLL	ENTO	20	05
3703RSD26077222.05	004	0510ARACACAR		00	11
3703RSD26077222.05	004	0510INSECOLL	ENTO	40	1
3703RSD26077222.05	004	0005ARACACAR		00	47
3703RSD26077222.05	004	0005INSECOLL	PODU	40	3
3703RSD26077222.05	005	0510ARACACAR		00	18
3703RSD26077222.05	005	0005ARACACAR		00	44
3703RSD26077222.05	005	0005INSECOLL	PODU	40	2
3703RSD07087211.05	001	0510INSECOLL	ENTO	10	4
3703RSD07087211.05	001	0510ARACACAR		00	2
3703RSD07087211.05	001	0510INSE		00	3
3703RSD07087211.05	001	0005INSECOLE		40	1
3703RSD07087211.05	001	0005ARACACAR		00	15
3703RSD07087211.05	001	0005INSE		40	1
3703RSD07087211.05	001	0005INSECOLL	ENTO	40	7
3703RSD07087211.05	002	0510INSECOLL	PODU	40	3
3703RSD07087211.05	002	0510INSECOLL	ENTO	40	1
3703RSD07087211.05	002	0510ARACACAR		00	2

3703RSD07087211.05	002	0005ARACACAR		00	27
3703RSD07087211.05	002	0005INSECOLL	PODU	00	1
3703RSD07087211.05	002	0005INSECOLL	ENTO	10	1
3703RSD07087211.05	003	0510ARACACAR		00	1
3703RSD07087211.05	003	0510INSECOLL	PODU	00	3
3703RSD07087211.05	003	0005INSEHOMO	APHI	40	4
3703RSD07087211.05	003	0005ARACACAR		00	28
3703RSD07087211.05	003	0005INSECOLL	PODU	40	6
3703RSD07087211.05	003	0005INSECOLL	ENTO	40	5
3703RSD07087211.05	004	0510INSECOLL	PODU	40	1
3703RSD07087211.05	004	0510ARACACAR		00	1
3703RSD07087211.05	004	0005INSECOLL	PODU	40	9
3703RSD07087211.05	004	0005ARACACAR		00	20
3703RSD07087211.05	004	0005INSEHOMO	APHI	40	1
3703RSD07087211.05	005	0510ARACACAR		00	4
3703RSD07087211.05	005	0005ARACACAR		00	15
3703RSD09087212.05	001	0510ARACACAR		00	29
3703RSD09087212.05	001	0510INSECOLL	ENTO	40	1
3703RSD09087212.05	001	0005INSECOLL	ENTO	40	9
3703RSD09087212.05	001	0005INSECOLL	ENTO	10	1
3703RSD09087212.05	001	0005ARACACAR		00	32
3703RSD09087212.05	002	0510ARACACAR		00	5
3703RSD09087212.05	002	0510INSEHEMI		40	1
3703RSD09087212.05	002	0005ARACACAR		00	5
3703RSD09087212.05	003	0510ARACACAR		00	04
3703RSD09087212.05	003	0005ARACACAR		00	19
3703RSD09087212.05	003	0005INSECOLL	ENTO	40	7
3703RSD09087212.05	004	0510ARACACAR		00	30
3703RSD09087212.05	004	0005ARACACAR		00	37
3703RSD09087212.05	004	0005INSECOLL	PODU	40	1
3703RSD09087212.05	005	0510INSECOLL	ENTO	40	22
3703RSD09087212.05	005	0510ARACACAR		00	7
3703RSD09087212.05	005	0005INSECOLL	ENTO	40	13
3703RSD09087212.05	005	0005ARACACAR		00	27
3703RSD07087221.05	001	0510ARACACAR		00	17
3703RSD07087221.05	001	0005INSECOLE		40	1
3703RSD07087221.05	001	0005ARACACAR		00	67
3703RSD07087221.05	001	0005INSECOLL	ENTO	40	1
3703RSD07087221.05	002	0510ARACACAR		00	7
3703RSD07087221.05	002	0510INSE		40	3
3703RSD07087221.05	002	0510INSECOLL	ENTO	40	1
3703RSD07087221.05	002	0005ARACACAR		00	86
3703RSD07087221.05	002	0005INSEHOMO	APHI	40	1
3703RSD07087221.05	002	0005INSECOLE		10	1
3703RSD07087221.05	002	0005INSETHYS		00	1
3703RSD07087221.05	002	0005INSECOLL	ENTO	40	1
3703RSD07087221.05	003	0510ARACACAR		00	10
3703RSD07087221.05	003	0005ARACACAR		00	59
3703RSD07087221.05	003	0005INSECOLL	PODU	40	1
3703RSD07087221.05	004	0510INSEHYME	FORM	10	1
3703RSD07087221.05	004	0510INSE		40	1
3703RSD07087221.05	004	0510INSEHOMO		00	1
3703RSD07087221.05	004	0510ARACACAR		00	6
3703RSD07087221.05	004	0005ARACARAN		00	104
3703RSD07087221.05	004	0005INSECOLL	ENTO	10	1
3703RSD07087221.05	004	0005INSECOLL	ENTO	40	3
3703RSD07087221.05	005	0510ARACACAR		00	9
3703RSD07087221.05	005	0005ARACACAR		00	24
3703RSD07087221.05	005	0005INSECOLL	ENTO	10	1

3703RSD07087221.05	005	0005INSECOLL	ENTO	40	1
3703RSD09087222.05	001	0510ARACACAR		00	1
3703RSD09087222.05	001	0005INSECOLE		40	1
3703RSD09087222.05	001	0005INSEHYME		10	1
3703RSD09087222.05	001	0005ARACACAR		00	9
3703RSD09087222.05	002	0510ARACACAR		00	7
3703RSD09087222.05	002	0510INSECOLL	ENTO	40	3
3703RSD09087222.05	002	0005INSECOLE		40	1
3703RSD09087222.05	002	0005ARACACAR		00	18
3703RSD09087222.05	002	0005INSECOLL	ENTO	40	1
3703RSD09087222.05	002	0005INSECOLL	PODU	40	1
3703RSD09087222.05	003	0005ARACACAR		00	21
3703RSD09087222.05	003	0005INSECOLL	ENTO	40	1
3703RSD09087222.05	004	0510INSECOLL	ENTO	40	6
3703RSD09087222.05	004	0510INSECOLL	PODU	40	2
3703RSD09087222.05	004	0510ARACACAR		00	3
3703RSD09087222.05	004	0005ARACACAR		00	17
3703RSD09087222.05	004	0005INSECOLL	ENTO	40	2
3703RSD09087222.05	005	0510INSECOLL	PODU	40	1
3703RSD09087222.05	005	0510INSECOLL	ENTO	40	4
3703RSD09087222.05	005	0510ARACACAR		00	12
3703RSD09087222.05	005	0005ARACACAR		00	19
3703RSD21087211.05	001	0510ARACACAR		00	4
3703RSD21087211.05	001	0510INSECOLL	PODU	40	1
3703RSD21087211.05	001	0005ARACACAR		00	74
3703RSD21087211.05	001	0005INSECOLE		40	2
3703RSD21087211.05	001	0005INSECOLL		40	2
3703RSD21087211.05	002	0510INSECOLL	PODU	40	7
3703RSD21087211.05	002	0510ARACACAR		00	16
3703RSD21087211.05	002	0005ARACACAR		00	75
3703RSD21087211.05	002	0005INSECOLL	PODU	40	4
3703RSD21087211.05	002	0005INSECOLL	ENTO	40	1
3703RSD21087211.05	003	0510ARACACAR		00	5
3703RSD21087211.05	003	0510INSECOLL	PODU	40	1
3703RSD21087211.05	003	0005ARACACAR		00	49
3703RSD21087211.05	003	0005INSECOLL	ENTO	40	3
3703RSD21087211.05	004	0510ARACACAR		00	12
3703RSD21087211.05	004	0005ARACACAR		00	52
3703RSD21087211.05	004	0005INSECOLL	ENTO	40	2
3703RSD21087211.05	005	0510ARACACAR		00	2
3703RSD21087211.05	005	0005ARACACAR		00	33
3703RSD21087211.05	005	0005INSETHYS		10	1
3703RSD21087211.05	005	0005INSETHYS		40	1
3703RSD25087212.05	001	0510INSECOLL	ENTO	40	2
3703RSD25087212.05	001	0510ARACACAR		00	9
3703RSD25087212.05	001	0005ARACACAR		00	28
3703RSD25087212.05	001	0005INSECOLL	ENTO	40	1
3703RSD25087212.05	001	0005INSECOLL	PODU	40	1
3703RSD25087212.05	002	0510ARACACAR		00	12
3703RSD25087212.05	002	0005INSECOLL	ENTO	40	17
3703RSD25087212.05	002	0005ARACACAR		00	21
3703RSD25087212.05	003	0510ARACACAR		00	5
3703RSD25087212.05	003	0510INSECOLE		40	2
3703RSD25087212.05	003	0005ARACACAR		00	6
3703RSD25087212.05	004	0510ARACACAR		00	23
3703RSD25087212.05	004	0510INSE		40	2
3703RSD25087212.05	004	0005ARACACAR		00	36
3703RSD25087212.05	004	0005INSECOLE	STAP	10	1
3703RSD25087212.05	005	0510INSE		40	1
3703RSD25087212.05	005	0005ARACACAR		00	42

3703RSD25087212.05	005	0005INSECOLL	ENTO	40	10
3703RSD21087221.05	001	0510ARACACAR		00	5
3703RSD21087221.05	001	0005ARACACAR		00	36
3703RSD21087221.05	001	0005INSECOLE		40	1
3703RSD21087221.05	001	0005INSECOLL	ENTO	40	1
3703RSD21087221.05	001	0005INSECOLL	ENTO	10	1
3703RSD21087221.05	002	0510ARACACAR		00	2
3703RSD21087221.05	002	0005ARACACAR		00	18
3703RSD21087221.05	002	0005INSECOLL	ENTO	40	2
3703RSD21087221.05	003	0510ARACACAR		00	1
3703RSD21087221.05	003	0005ARACACAR		00	15
3703RSD21087221.05	003	0005INSEDIPT		40	1
3703RSD21087221.05	004	0510ARACACAR		00	3
3703RSD21087221.05	004	0510INSECOLL		40	3
3703RSD21087221.05	004	0005ARACACAR		00	12
3703RSD21087221.05	004	0005INSEHOMO	PHYL	40	1
3703RSD21087221.05	005	0510ARACACAR		00	5
3703RSD21087221.05	005	0005ARACACAR		00	28
3703RSD21087221.05	005	0005INSECOLE		40	1
3703RSD21087221.05	005	0005INSEDIPT		40	1
3703RSD25087222.05	001	0510ARACACAR		00	3
3703RSD25087222.05	001	0510INSECOLL	PODU	40	3
3703RSD25087222.05	001	0005ARACACAR		00	7
3703RSD25087222.05	002	0510INSECOLL	ENTO	40	1
3703RSD25087222.05	002	0510ARACACAR		00	15
3703RSD25087222.05	002	0005ARACACAR		00	7
3703RSD25087222.05	003	0510ARACACAR		00	1
3703RSD25087222.05	003	0510INSECOLL	ENTO	40	1
3703RSD25087222.05	003	0005ARACACAR		00	5
3703RSD25087222.05	004	0510ARACACAR		00	7
3703RSD25087222.05	004	0005INSECOLL	ENTO	40	5
3703RSD25087222.05	004	0005INSECOLL	PODU	40	1
3703RSD25087222.05	004	0005ARACACAR		00	6
3703RSD25087222.05	005	0510INSECOLL	PODU	40	1
3703RSD25087222.05	005	0510ARACACAR		00	7
3703RSD25087222.05	005	0005INSECOLL	ENTO	40	4
3703RSD25087222.05	005	0005ARACACAR		00	22

Small Mammal Live Trapping Data, Assessment Lines

Small mammal live trapping data collected on assessment lines at the Bridger Site in 1972 were recorded on Form NREL-17. These data, like the corresponding grid data, are stored as Grassland Biome data set A2U10B3. A sample data form and a listing of the data are attached.

IBP

GRASSLAND BIOME

U.S. INTERNATIONAL BIOLOGICAL PROGRAM

FIELD DATA SHEET--VERTEBRATE - ASSESSMENT LINES

Data Type	Site	Initials	Date Day	Date Month	Date Year	Treatment	Replicate	Genus	Species	Subspecies	Condition	Mark	Number	Male	Female	Weight	Molt	Line Number	Trap Number	Previous Number
1-2	3-4	5-7	8-9	10-11	12-13	14	15	21-22	23-24	25	27	29	31-34	36	38	40-44	46	49	51-52	54-57
17																				

Data Type
17 Vertebrate - assessment lines

Site
01 ALE
02 Bison
03 Bridger
04 Cottonwood
05 Dickinson
06 Hays
07 Annual
08 Jornada
09 Osage
10 Pantex
11 Pawnee
12

Treatment
1 Ungrazed
2 Lightly grazed
3 Moderately grazed
4 Heavily grazed
5 Ungrazed current year only
A Diet light
B Diet moderate
C Diet heavy
D ESA - O
E ESA - W
F ESA - N
G ESA - WN

Male
0 Adult, non-breeding
1 Subadult, non-breeding
2 Juvenile, non-breeding
3 Adult breeding?
4 Subadult breeding?
5 Juvenile breeding?
6 Adult breeding
7 Subadult breeding
8 Juvenile breeding
9 Undetermined

Female
0 Adult, vulva inactive
1 Subadult, vulva inactive
2 Juvenile, vulva inactive
3 Adult, vulva turgid
4 Subadult, vulva turgid
5 Juvenile, vulva turgid
6 Adult, vulva cornified
7 Subadult, vulva cornified
8 Juvenile, vulva cornified
9 Pregnant

Condition
0 Normal
1 Escaped
2 Torpid
3 Dead

Molt
0 No evidence
1 Post-juvenile
2 Post-subadult
3 Adult (vernal)
4 Adult (autumnal)
5 Molt of unknown stage
6 Undetermined

Mark
0 Normal
1 Unmarked
2 Ear tag
3 Toe clip
4 Ear tag and toe clip
5 Natural amputation

+++ LISTING OF DATA +++

```
         1         2         3         4         5         6
12345678901234567890123456789012345678901234567890123456789012345678
```

17038MH2108723	PEMA	0	3	20		9	26	0	8	13
17038MH2108723	PEMA	0	3	140		6	18	0	7	14
17038MH2108723	PEMA	0	3	38	0		19	0	7	10
17038MH2208723	PEMA	0	3	38	0		19	0	8	13
17038MH2308723	PEMA	0	3	12	6			6	7	13
17038MH2308723	PEMA	0	3	140		6		6	7	15
17038MH2308723	PEMA	0	3	20				6	6	13
17038MH2308723	PEMA	0	3	41		9		6	3	17
17038MH2308723	PEMA	0	3	61		1		6	3	5
17038MH2308723	PEMA	0	3	74		0		6	5	3
17038MH2408723	PEMA	0	3	140		6	21	0	7	16
17038MH2408723	PEMA	0	3	62	6		20	0	1	17
17038MH2408723	PEMA	0	3	43	0		16	0	1	9
17038MH2408723	PEMA	0	3	26		9	38	0	1	1
17038MH2508723	PEMA	0	3	140		6	21	0	7	15
17038MH1108721	PEMA	0	3	40	6		22	0	7	6
17038MH1108721	PEMA	0	3	41	1		14	0	1	8
17038MH1108721	PEMA	0	3	42	6		19	0	2	13
17038MH1108721	PEMA	0	3	16		9	18	0	2	12
17038MH1108721	PEMA	0	3	43	2		9	0	3	12
17038MH1108721	PEMA	0	3	44	2		10	0	3	12
17038MH1208721	PEMA	0	3	45	1		13	0	6	9
17038MH1208721	PEMA	0	3	40	6		24	0	7	6
17038MH1208721	MIMO	0	3	12	3		36	0	7	15
17038MH1208721	MIMO	3	3	2		0	30	0	8	13
17038MH1208721	PEMA	0	3	46		6	22	0	8	5
17038MH1208721	PEMA	0	3	47	0		17	0	8	4
17038MH1208721	PEMA	0	3	48		9	24	0	1	6
17038MH1208721	PEMA	0	3	49	6		24	0	1	7
17038MH1208721	MIMO	0	3	10		3	29	0	2	14
17038MH1208721	PEMA	0	3	50		2	10	0	1	8
17038MH1208721	PEMA	0	3	16		6	19	0	2	12
17038MH1308721	PEMA	0	3	51	6		18	0	6	6
17038MH1308721	PEMA	3	3	52	1		14	0	1	7
17038MH1308721	PEMA	0	3	41	1		14	0	1	8
17038MH1308721	PEMA	0	3	16		6	16	0	2	12
17038MH1308721	PEMA	3	3	53	1		13	0	3	12
17038MH1308721	PEMA	0	3	54	3		18	0	6	9
17038MH1308721	PEMA	3	3	55	0		16	0	7	3
17038MH1308721	PEMA	0	3	56		1	13	0	7	6
17038MH1408721	PEMA	3	3	40	0		19	0	7	6
17038MH1408721	PEMA	0	3	46		6	19	0	8	5
17038MH1408721	MIMO	0	3	17		6	26	0	5	2
17038MH1508721	PEMA	3	3	56		0	18	6	7	6
17038MH1508721	MIMO	0	3	18		0	35	6	8	11
17038MH1508721	PEMA	3	6		1			6	1	7
17038MH1508721	PEMA	0	3	16		6	15	0	2	12
17038MH0608723	PEMA	0	3	36		1		6	6	15
17038MH0608723	PEMA	0	3	42		1		0	1	13
17038MH0608723	PEMA	0	3	44		4		0	1	9
17038MH0608723	PEMA	0	3	14	6			0	8	13
17038MH0608723	PEMA	0	3	38	0			0	7	12
17038MH0608723	PEMA	3	3	45		0		0	8	15
17038MH0608723	PEMA	0	3	37	1			0	7	10
17038MH0608723	PEMA	0	3	46	3			0	7	7

1703BMH0708723	PEMA	0	3	19	6		19	0	6	7
1703BMH0708723	PEMA	0	3	27	6		16	0	7	3
1703BMH0708723	PEMA	0	3	47	6		19	0	6	11
1703BMH0708723	PEMA	0	3	36		0	20	0	6	14
1703BMH0708723	PEMA	0	3	48		6	18	0	4	11
1703BMH0708723	PEMA	0	3	49		6	19	0	2	11
1703BMH0708723	MIMO	3	3	2	6		26	0	2	8
1703BMH0708723	PEMA	0	3	14	6		18	0	8	13
1703BMH0708723	PEMA	0	3	31	6		18	0	8	13
1703BMH0708723	PEMA	3	3	37	1		14		7	12
1703BMH0708723	PEMA	0	3	32	1		16		7	9
1703BMH0708723	PEMA	0	3	12	6		18		7	8
1703BMH0808723	PEMA	3	3	19	6		19	0	6	7
1703BMH0808723	PEMA	3	3	32	1		13	0	7	9
1703BMH0808723	PEMA	0	3	47	6		18	0	5	12
1703BMH0808723	PEMA	3	3	50	3		17	0	5	3
1703BMH0808723	PEMA	1	1					6	5	2
1703BMH0808723	PEMA	0	3	51	6		15	0	2	10
1703BMH0808723	PEMA	0	3	15	6		16	0	2	13
1703BMH0808723	PEMA	0	3	52	1		13	0	1	4
1703BMH0808723	MIMO	0	3	3		1	16	0	8	2
1703BMH0808723	PEMA	0	3	20		9	25	0	8	12
1703BMH0808723	PEMA	0	3	140		6	15	0	7	14
1703BMH0808723	PEMA	0	3	46	6		15	0	7	6
1703BMH0908723	PEMA	3	3	47	6			0	6	11
1703BMH0908723	PEMA	0	3	24	6			0	5	2
1703BMH0908723	PEMA	0	3	48		6		0	4	11
1703BMH0908723	PEMA	0	3	41		1		0	3	16
1703BMH0908723	PEMA	3	3	15	6			0	2	11
1703BMH0908723	PEMA	0	3	14	6			0	1	14
1703BMH0908723	PEMA	0	3	43	3			0	1	13
1703BMH0908723	PEMA	3	3	31	6			0	8	13
1703BMH0908723	PEMA	0	3	140		6		0	7	17
1703BMH1008723	PEMA	0	3	54	6		21	0	6	1
1703BMH1008723	PEMA	0	3	40	6		16	0	6	9
1703BMH1008723	PEMA	0	3	26		0	19	0	6	14
1703BMH1008723	PEMA	0	3	14	6		16	0	1	16
1703BMH1008723	MUFR	3	3	2			153	0	3	15
1703BMH1008723	PEMA	0	3	43	6		17	0	1	12
1703BMH1008723	PEMA	0	3	55	6		20	0	7	4
1703BMH1008723	PEMA	0	3	28		9	34	0	7	3
1703BMH2608721	MIMO	3	3	31		0	31	0	4	11
1703BMH2608721	MIMO	0	3	20		6	30	0	7	16
1703BMH2708721	PEMA	0	3	9		0	20	0	2	14
1703BMH2708721	MIMO	0	3	32		0	26	0	4	11
1703BMH2708721	MIMO	0	3	33		0	47	0	5	5
1703BMH2708721	PEMA	0	3	76		9	28	0	6	9
1703BMH2808721	PEMA	0	3	77	0		16	0	1	8
1703BMH2808721	PEMA	0	3	76		9	25	0	6	9
1703BMH2908721	PEMA	3	3	78	0		17	0	1	5
1703BMH2908721	PEMA	0	3	9		0	20	0	2	15
1703BMH3008721	PEMA	0	3	76		9	20	0	6	9
1703BMH3008721	THTA	3	3	1	1		41	0	7	16
1703BMH3008721	PEMA	0	3	79	2		11	0	1	16
1703BMH3008721	PEMA	0	3	60		2	9	0	1	15
1703BMH3008721	PEMA	0	3	41		1	13	0	1	7
1703BMH3008721	PEMA	0	3	81	1		14	0	2	10
1703BMH1707721	PEMA	0	3	6	6			0	4	13
1703BMH1807721	ZAPR	0	3	3		6	23	0	3	15

1703BMH1807721	PEMA	0	3	16		0	20	0	2	11
1703BMH1807721	PEMA	0	3	12	6		19	0	4	9
1703BMH1907721	PEMA	3	3	18	6			6	1	6
1703BMH2007721	PEMA	0	3	17	6			6	4	8
1703BMH2107721										
1703BMH1007723	PEMA	0	3	19	6		18	0	6	8
1703BMH1007723	PEMA	0	3	6	6			6	6	14
1703BMH1007723	PEMA	0	3	16	6			6	3	10
1703BMH1007723	MUFR	3	3	1				6	1	9
1703BMH1007723	PEMA	0	3	20		6	19	0	8	13
1703BMH1007723	PEMA	0	3	5	6			6	7	12
1703BMH1007723	PEMA	0	3	21		9	23	0	7	6
1703BMH1107723	PEMA	0	3	22	3		24	0	6	3
1703BMH1107723	PEMA	0	3	23		1	15	0	6	6
1703BMH1107723	PEMA	1	1					6	6	8
1703BMH1107723	PEMA	1	1					6	6	14
1703BMH1107723	PEMA	3	3	16	6			0	3	10
1703BMH1107723	PEMA	0	3	14	6			0	1	16
1703BMH1107723	PEMA	3	3	5	6			0	7	12
1703BMH1207723	PEMA	0	3	22	6			6	6	5
1703BMH1207723	PEMA	0	3	24	3		23	0	6	6
1703BMH1207723	PEMA	3	3	25	6		19	0	6	8
1703BMH1207723	PEMA	3	3	6	6			0	6	14
1703BMH1207723	PEMA	0	3	26		9	29	0	1	1
1703BMH1207723	PEMA	0	3	20		6		6	8	10
1703BMH1207723	PEMA	0	3	27	6		20	0	7	3
1703BMH1207723	PEMA	0	3	28		9	29	0	7	2
1703BMH1307723	PEMA	0	3	29	3		19	0	6	2
1703BMH1307723	PEMA	0	3	23		1		0	6	5
1703BMH1307723	PEMA	0	3	40	6		21	0	6	7
1703BMH1307723	PEMA	0	3	19		3		6	6	8
1703BMH1307723	PEMA	0	3	30	4		14	0	3	9
1703BMH1307723	PEMA	0	3	31	3		18	0	1	1
1703BMH1307723	PEMA	0	3	32	2		11	0	8	13
1703BMH1307723	PEMA	0	3	12	6		17	0	7	9
1703BMH1307723	PEMA	0	3	15	6			0	1	16
1703BMH1407723	PEMA	0	3	33		3	24	0	6	3
1703BMH1407723	PEMA	0	3	26		9	31	0	1	1
1703BMH1407723	PEMA	0	3	24	3			0	6	6
1703BMH1407723	PEMA	0	3	23		1		0	6	7
1703BMH1407723	PEMA	0	3	29	3			0	6	8
1703BMH1407723	PEMA	0	3	34	6		24	0	6	10
1703BMH1407723	PEMA	0	3	17	6			0	3	10
1703BMH1407723	PEMA	0	3	35	6		19	0	1	17
1703BMH1407723	PEMA	0	3	12	6			0	7	12
1703BMH1407723	PEMA	0	3	28		9	30	0	7	3
1703BMH1407723	PEMA	1	1					6	7	3
1703BMH1407723	PEMA	0	3	14	6			0	8	15