

Technical Report No. 38  
COMPREHENSIVE NETWORK SITE DESCRIPTION  
BRIDGER

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GRASSLANDS BIOME  
U. S. International Biological Program

I. *Site name:* BRIDGER

- a. U. S. Forest Service Land - cooperative agreement with Montana State University.

II. *Location and Elevation*

- a. Bridger Mountain Range - 7600 ft
- b. Southwestern Montana
- c. 14 air miles northeast of Bozeman, Montana
- d. Summer access: Reached by following Bridger Canyon road northeast of Bozeman for 19 miles, then east on Brackett Creek road for eight miles, then south on Bangtail Grazing Association road for six miles (approximately 33 miles). The road is all weather except for Grazing Association road; access is good during July, August, September. Road is closed from October 1 - June 1. Winter Access: Snow machine only. Access must be cleared through MSU (Don Collins) as the gates are locked on Grazing Association road.

III. *Size*

Actual research area is approximately 35 acres; entire Bangtail Ridge is approximately 15 miles long by 10 miles wide. Census experiments may be conducted over large portions of the entire range if investigators will contact Don Collins well in advance so clearances can be obtained. The actual research site has been enclosed by fence and used as an occasional horse pasture by U. S. Forest Service personnel on infrequent occasions since the 1930's.

IV. *Vegetation type*

Mountain bunchgrass-forb type. Research site is level, all slopes and aspects available in close proximity of site.

- a. List of major vegetational species: This is included on attached sheets.
- b. Animal species: mule deer, black bear, pocket gophers, voles, badgers, weasels, coyotes, bobcats.
- c. Birds - a list of species is included on a separate page.
- d. Insects - a list of species is included on a separate page.
- e. Sheep and cattle during grazing season.

V. *Climate*

The most frequent storm situation is the passage of Pacific frontal systems which move into the area on prevailing westerlies and rise over the Bridger Range. These storms bring frequent moderate amounts of winter snow, especially to the higher elevations.

Occasional severe storms which form in the area bring very cold air from the northeast upslope against the eastern slopes of the Rockies and specifically up the eastern slopes of Bangtail Ridge and Bozeman Pass. While storms of this type are less common, they appear to bring more snow per storm than Pacific frontal storms, especially to valley locations.

- a. Rainfall and Temperature: The nearest meteorological recording station is the Forsyth Ranch, located four miles WNW from the experimental site at a lower elevation. It is estimated that the monthly totals should at least be doubled at the research site. Meteorological data are presently being gathered at the Bridger site but is not yet available.
- b. Forsyth Data:

Average annual ppt 12.17 inches

Monthly - 1969

January	.41 inches
February	.37
March	.59
April	.88
May	2.13
June	2.86
July	1.32
August	.89
September	1.04
October	.86
November	.50
December	.32

Temperature:

Annual max.	59.9
Annual min.	32.0
Mean annual	45.9

- c. Orographic features: The Bridger Range is a roughly north-south oriented mountain chain with precipitous slopes on both east and west, and a crest altitude generally exceeding 8,500 ft MSL. To the west, there is a broad plateau-valley at an elevation of approximately 4,500 ft MSL extending to the Tobacco Root Mountains about 35 miles away. To the east, the land slopes gently downward, reaching an average elevation of approximately 3,000 ft MSL 150 miles from the Bridger Range crest. Generally speaking, the landscape is gently rolling with a major or defile provided by the cutting action of the Yellowstone River. About 30 miles northeast of the Bridger Range, is the Crazy Mountain Range - a roughly circular array of jagged peaks which are largely inaccessible during the winter months.

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- d. Major recording station (weather): Montana State University - 14 air miles; Minor recording station: Forsyth Ranch - 4 miles.

#### VI. *Soils*

- a. Information is found on attached sheet titled "Bridger Site Soil Analysis"
- b. Topography - research area is level
- c. Exposure - all available in short distance

#### VII. *Facilities*

Limited facilities are available at the research site. Arrangements must be made in advance with Don Collins. A slight per diem charge is made.

#### VIII. *Studies*

At the present, two major investigations are being conducted:

- a. One is primarily concerned with environmental aspects of weather modification.
- b. The second with the ecological effects of weather modification. Both are in the third year of a proposed 10-year study. Aerial photo coverage is available.

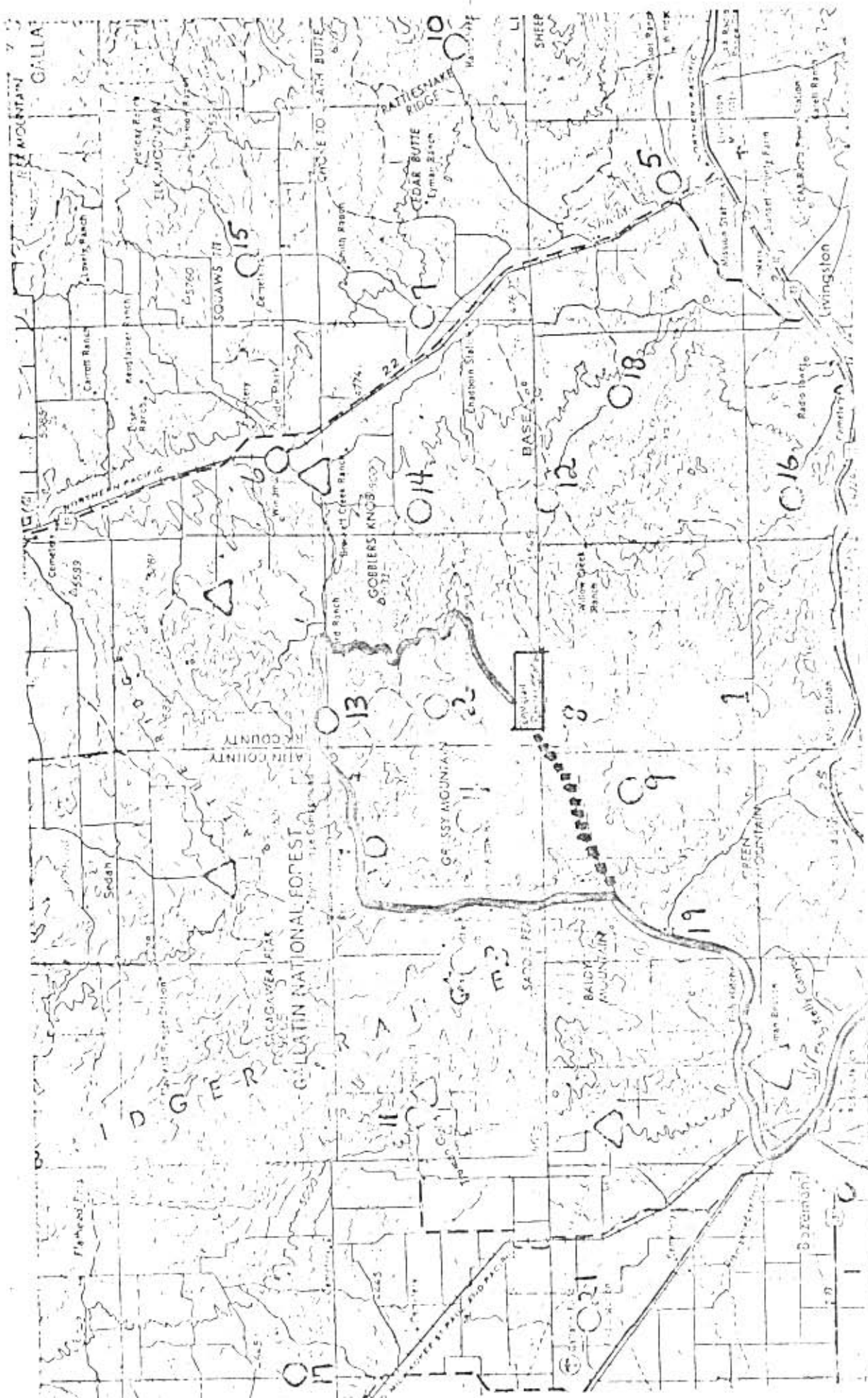
#### IX. *Publications*

Heady, H. F., R. T. Clark, and T. Lommasson. 1947. Range management and sheep production in the Bridger Mountains, Montana. Montana State Coll. Agr. Exp. Sta. Bull. 44.

Tryon, C. A. 1947. The biology of the pocket gopher in Montana. Montana State Coll. Agr. Exp. Sta. Bull. 48.

#### X. *Map*

Map of experimental area is enclosed.



MAP OF EXPERIMENTAL AREA

$\Delta$  Proposed AgI Seeding Sites  
 $\circ$  Precipitation Gauges  
 --- Bridger Ridge "A" Frame  
 ..... Snow machine trail  
 — Road

Montana State University Campus  
 10 Statute Miles  
 Scale 1:250,000  
 FIGURE 1

# Species List of Plants Occurring at Bangtail Research Site

Plant	Plant
Agoseris glauca	Galium boreale
Agoseris grandiflora	Galium trifidum
Agropyron subsecundum	Grindelia squarrosa
Anemone drummondii	Hackelia floribunda
Anemone patens	Heuchera cylindrica
Antennaria pulcherrima	Koeleria cristata
Antennaria rosea	Lomatium cous
Arnica lonchophylla	Lupinus argenteus
Artemisia michauxiana	Luzula spicata
Astragalus miser	Melice spectabilis
Besseyia cinerea	Mertensia oblongifolia
Bromus mollis	Myosotis sylvatica
Bupleurum americanum	Orthocarpus luteus
Carduus acanthoides	Oxytropis besseyi
Carex brevior	Oxytropis sericea
Carex eleocharis	Penstemon eriantherus
Carex geyeri	Phacelia heterophylla
Castilleja miniata	Phleum alpinum
Castilleja linariaefolia	Poa canbyi
Cerastium arvense	Polemonium pulcharrimum
Chrysopsis villosa	Potentilla gracilis
Claytonia lanceolata	Potentilla ovina
Clematis hirsutissima	Pteryxia terebinthina
Collomia linearis	Ranunculus glaberrimus
Danthonia intermedia	Rumex gaucifolous
Dianthus armeria	Saxifraga rhomboidea
Dodecatheon conjugens	Sedum stemopetalum
Draba nuttalli	Senecio canus
Erigeron caespitosus	Senecio integerrimus
Erigeron simplex	Silene parryi
Erigeron speciosus	Stipa viridula
Eriogonum flavum	Taraxicum laevigatum
Eriogonum umbellatum	Thlaspi fendleri or arvense
Erysimum asperum	Towsendia exscapa
Frasera speciosa	Valeriana occidentalis
Fritillaria pudica	Xanthium strumarium

The following bird species may be found in the area. Resident species are starred. Species are listed in order of approximate abundance.

Audubon's warbler	Red-tailed hawk
Pine siskin	*Ruffed grouse
Warbling viree	*Gray jay
Ruby-crowned kinglet	*Common raven
*Mountain chickadee	*Brown creeper
Oregon junco	Green-tailed towhee
White-crowned sparrow	*Great horned owl
MacGillivray's warbler	Calliope hummingbird
Chipping sparrow	*Northern three-toed woodpecker
Yellow warbler	*Golden-crowned kinglet
Cassin's finch	Fox sparrow
Western tanager	Rock wren
Lincoln's sparrow	*Goshawk
Wilson's warbler	*Golden eagle
Swainson's thrush	Blackbilled magpie
Lazuli bunting	*Pygmy owl
*Clark's nutcracker	Williamson's sapsucker
Red-breasted nuthatch	*Great gray owl
Veery	*Black-backed three-toed woodpecker
Mountain bluebird	
Robin	
Hammond's flycatcher	
Hermit thrush	
Orange-crowned warbler	
Evening grosbeak	
Red crossbill	
Horned lark	
Vesper sparrow	
*Blue grouse	
*Hairy woodpecker	
Dusky flycatcher	
Western wood pewee	
*Dipper	
*Townsend's solitaire	
Brown-headed cowbird	
Olive-sided flycatcher	
*Steller's jay	
Mourning dove	
Red-shafted flicker	
Yellow-bellied sapsucker	
Violet-green swallow	
Tree swallow	
Black-headed grosbeak	
*Pine grosbeak	
American goldfinch	
Western meadowlark	

Orthoptera from the Bangtail:

Acrididae

- Brunneria brunnea* (Thomas)
- Camula pellucida* (Scudder)
- Chorthippus longicornis* (Latreille)
- Chloealtis conspersa* (Harris)
- Melanoplus alpinus* (Scudder)
- Melanoplus bivittatus* (Say)
- \**Melanoplus bruneri* (Scudder)
- \**Melanoplus oregonensis* (Thomas)
- Neopodismopsis abdominalis* (Thomas)
- Trimerotropis suffusa* (Scudder)

Tettigoniidae

- Orchelimum* sp.
- Steiroxys trilineata* (Thomas)

\*Dominant species

## BRIDGER SITE SOIL ANALYSIS

Transect # 3  
Tube # 4

Date: August 5, 1969  
Area: Research Site

HORIZON	A <sub>11</sub>	A <sub>12</sub>	B <sub>2</sub>	B <sub>3</sub>	R
Thickness:					
cm	0-8 8	8-38 30	38-81 43	81-110 29	110+
Inches	0-3 3	3-15 12	15-32 17	32-43 11	43+
Texture:					
Field	50-30-20	50-30-20	45-30-25	50-27-23	
Lab	72-22-6	62-27-11	57-31-12	62-28-10	
Course Fragments:					
Field	1	5	70	85	90+
Sample	1%	4%	28%	41%	
Bulk:					
Field	.96	1.22-1.30	1.35		
P.H.S.P.					
Lab	5.75	5.70	5.35	5.35	
O.M.%	5.98	4.24	2.51	1.70	
P LBS/A	40	50	56	68	
K LBS/A	1360	1200	600	640	
CA++Meg/100g	>12	>12	>12	>12	
MG++Meg/100g	5.88	7.48	>8.23	>8.23	
NA Meg/100g	.4	.6	.6	.7	
SAT %	67	50	36		
Roots	VF.F >14 M 1-3 C 1-3	UF.F 4-14 M 1-3 C 1-3	UF.F 4-14 M 1-3	VF 4-14	
Pores	N.U.	UF >14	VF 4-14	VF 1-3	
Structure	MFG	WMP (FG)	MMSBK	Massive	
Charcoal	None				
Krotovinas	None				

BRIDGER SITE SOIL ANALYSIS (continued)

SITE CHARACTERS

PPT Aug.	3.24
PPT Sept.	2.37
Temp. 50 cm	9
Depth to bedrock	43" 110 cm
Rooting depth	43" 110 cm
Depth of tube	34.0"
g/m <sup>2</sup>	151 TDM veg.