

HARDWARE GRAVEL PIT - TREND STUDY NO. 2-42

Site Information

Site Description: The study is located in about a mile northwest of the Hardware Ranch visitor center near an old gravel pit. Hardware Ranch is administered by the Utah Division of Wildlife Resources (UDWR). The study monitors a mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and antelope bitterbrush (*Purshia tridentata*) community within winter range that is crucial to deer and elk. The study was placed in a location that has experienced a high amount of winter kill in recent years prior to the study establishment. Hunting is not allowed within the area. Deer pellet groups were sampled in moderate abundance in 2011. Elk pellet groups were sampled in low abundance in 2011 (Table - Pellet Group Data).

Browse: The key browse species within the community are mountain big sagebrush and antelope bitterbrush. The big sagebrush in the area displays growth attributes of basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*) but fluoresces like mountain big sagebrush. The plants are likely a hybrid of the two species. It appears these plants are less palatable to wildlife, similar to basin big sagebrush. All of the big sagebrush plants were classified as mountain big sagebrush for the purposes of this study. The mountain big sagebrush is a moderately dense, mature population with a high amount of decadence within the population. Utilization of sagebrush plants was moderate. There was no recruitment of young sagebrush plants sampled. The antelope bitterbrush population is small and decadent. Utilization of bitterbrush plants was heavy. There was no recruitment of young bitterbrush plants sampled. Other browse species found on the study include the highly preferred Saskatoon serviceberry (*Amelanchier alnifolia*), the weedy increaser broom snakeweed (*Gutierrezia sarothrae*), and Utah juniper (*Juniperus osteosperma*) (Table - Browse Characteristics).

Herbaceous Understory: The herbaceous understory is comprised almost entirely of annual grass and forb species. The most abundant perennial grass species are Sandberg bluegrass (*Poa secunda*) and bluebunch wheatgrass (*Agropyron spicatum*), yet occur infrequently. The weedy annual species Japanese chess (*Bromus japonicus*) and cheatgrass (*B. tectorum*) are the most common grass species, and provide the bulk of herbaceous production. An annual muhly species (*Muhlenbergia* sp.) is also frequent on the study. The forb community is moderately diverse, but is dominated by annual species. The most abundant perennial forb is the weedy species mulesears wyethia (*Wyethia amplexicaulis*). Annual forbs are abundant and include pale alyssum (*Alyssum alyssoides*), annual stickseed (*Lappula occidentalis*), storksbill (*Erodium cicutarium*), and willowweed (*Epilobium brachycarpum*) (Table - Herbaceous Trends).

Soil: The soil is part of the Yeates Hollow component, which is found on mountain slopes. The parent material consists of residuum, colluvium, and alluvium derived from quartzite and sandstone (Soil Survey Staff 2011). The soil texture is a sandy loam with a neutral soil reaction (pH 6.6) (Table - Soil Analysis Data). Exposed bare ground cover occurs rarely, and is irregularly distributed. Protective ground cover is abundant and is provided by high amounts of rock, vegetation, and litter (Table - Basic Cover). The soil erosion condition was classified as stable in 2011.

DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --
Management unit 2, study no: 42

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover (-POBU)	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
11	21.0	2.3	1.4	4.7	-19.1	10.0	0.0	20.4	Very Poor

HERBACEOUS TRENDS--

Management unit 02, Study no: 42

Type	Species	Nested	Average
		Frequency	Cover %
		'11	'11
G	Agropyron spicatum	29	.84
G	Bromus japonicus (a)	374	14.20
G	Bromus tectorum (a)	202	7.23
G	Muhlenbergia sp. (a)	45	3.99
G	Poa bulbosa	4	.04
G	Poa fendleriana	12	.25
G	Poa secunda	89	1.18
G	Sitanion hystrix	5	.06
Total for Annual Grasses		621	25.42
Total for Perennial Grasses		139	2.38
Total for Grasses		760	27.80
F	Achillea millefolium	7	.33
F	Agoseris glauca	10	.02
F	Alyssum alyssooides (a)	208	.92
F	Arenaria serpyllifolia	9	.53
F	Artemisia ludoviciana	2	.03
F	Camelina microcarpa (a)	1	.03
F	Cirsium sp.	10	.33
F	Collinsia parviflora (a)	98	.28
F	Collomia linearis (a)	112	.51
F	Descurainia pinnata (a)	38	.16
F	Draba sp. (a)	64	.25
F	Epilobium brachycarpum (a)	105	1.23
F	Erodium cicutarium (a)	116	.79
F	Galium aparine (a)	2	.03
F	Holosteum umbellatum (a)	107	.30
F	Lactuca serriola (a)	25	.08
F	Lappula occidentalis (a)	140	.63
F	Lomatium sp.	3	.03
F	Microsteris gracilis (a)	106	.34
F	Navarretia intertexta (a)	9	.18
F	Polygonum douglasii (a)	25	.10
F	Ranunculus testiculatus (a)	17	.05
F	Tragopogon dubius (a)	9	.02
F	Wyethia amplexicaulis	54	4.73
Total for Annual Forbs		1182	5.94
Total for Perennial Forbs		95	6.01
Total for Forbs		1277	11.96

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS--

Management unit 02, Study no: 42

Type	Species	Strip Frequency	Average Cover %
		'11	'11
B	Artemisia tridentata vaseyana	81	15.98
B	Gutierrezia sarothrae	12	.53
B	Juniperus osteosperma	1	
B	Purshia tridentata	7	.68
Total for Browse		101	17.20

CANOPY COVER, LINE INTERCEPT--

Management unit 02, Study no: 42

Species	Percent Cover
	'11
Artemisia tridentata vaseyana	21.08
Gutierrezia sarothrae	.65
Purshia tridentata	2.36

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 02, Study no: 42

Species	Average leader growth (in)
	'11
Artemisia tridentata vaseyana	4.3
Purshia tridentata	2.0

BASIC COVER--

Management unit 02, Study no: 42

Cover Type	Average Cover %
	'11
Vegetation	57.22
Rock	12.34
Pavement	.95
Litter	51.09
Cryptogams	.29
Bare Ground	3.14

SOIL ANALYSIS DATA --

Management unit 02, Study no: 42, Study Name: Hardware Gravel Pit

Effective rooting depth (in)	pH	Sandy Loam			%OM	PPM P	PPM K	ds/m
		% sand	% silt	% clay				
	6.6	54.0	32.9	13.1	2.9	17.1	187.2	0.4

PELLET GROUP DATA--

Management unit 02, Study no: 42

Type	Quadrat Frequency '11	Days use per acre (ha) '11
Grouse	1	-
Elk	3	5 (13)
Deer	9	21 (53)

BROWSE CHARACTERISTICS--

Management unit 02, Study no: 42

Y e a r	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Amelanchier alnifolia</i>									
11	0	0	0	-	-	0	0	0	67/61
<i>Artemisia tridentata vaseyana</i>									
11	3160	3	56	41	120	39	1	30	27/45
<i>Gutierrezia sarothrae</i>									
11	420	14	86	-	-	0	0	0	11/13
<i>Juniperus osteosperma</i>									
11	20	100	0	-	-	0	0	0	-/-
<i>Purshia tridentata</i>									
11	140	0	29	71	-	29	43	71	40/54