

CAVE FLAT - TREND STUDY NO. 15-10-11

Vegetation Type: Wyoming Big Sagebrush-Grass

Range Type: Crucial Deer Winter, Crucial Bison Year-Long

NRCS Ecological Site Description: [Semi-desert Shallow Sandy Loam \(Shadscale\), R035XY230UT](#)

Land Ownership: DWR

Elevation: 5,800 ft (1,768 m)

Aspect: southwest

Slope: 0%-3%

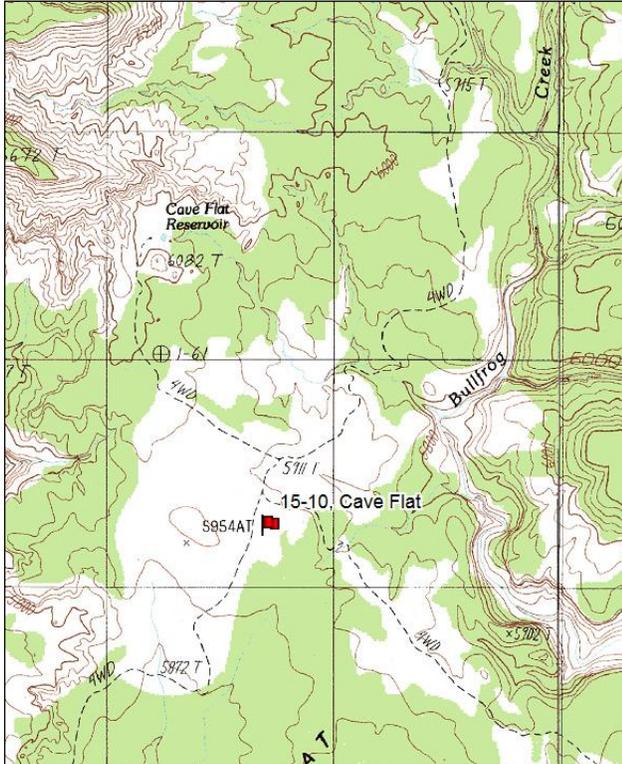
Transect bearing: 195 degrees magnetic.

Belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft)

Directions:

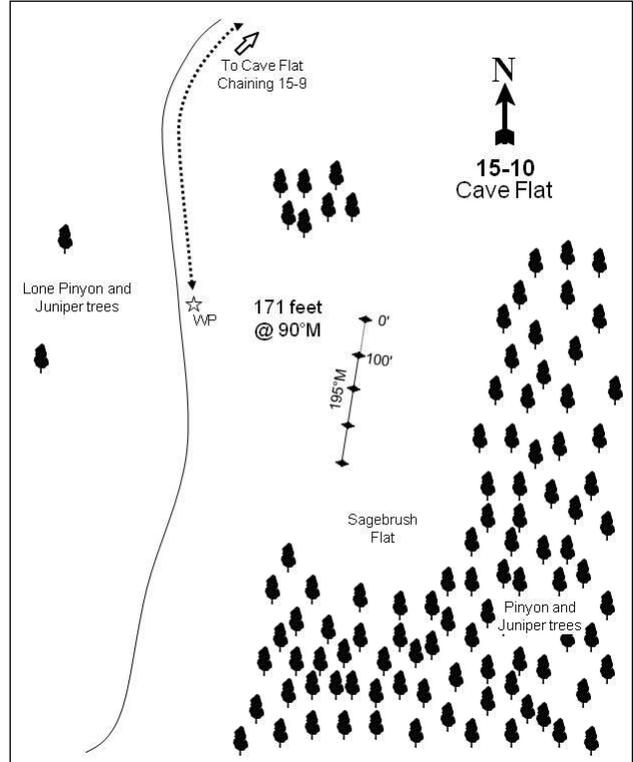
From Cave Flat Chaining (transect 15-9), continue south along Bullfrog Creek for 2.15 miles to a faint fork. Stay right. Go 0.7 miles to another faint intersection and stay right. Continue 0.15 miles into the large sage flat to the witness post on the left side of the road (a 2-foot tall piece of angle iron). The 0-foot baseline stake, a 2-foot tall fencepost, tagged #7126, is 171 feet bearing 90°M from the witness post. The transect runs southwest from there.

Map Name: Cave Flat



Township: 33S, Range: 9E, Section: unsurveyed

Diagrammatic Sketch:



GPS: NAD 83, UTM 509690 E 4198225 N

## CAVE FLAT - TREND STUDY NO. 15-10

### Site Information

Site Description: The study is located in a remote area on Cave Flat. The study samples a Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) flat, which is surrounded by a low elevation pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) woodland. A road runs through the middle of the flat, but is rarely traveled. The area is inaccessible by vehicle when Bullfrog Creek washes out the road at the turn to Bullfrog. The area is considered to be crucial deer winter range, as well as year-long range for bison. Pellet groups were sampled in low abundance for deer in 1999, but very high abundance in 2011. Cattle/bison sign was sampled in moderate abundance in 1999, but there was no sign sampled in 2011 (Table - Pellet Group Data).

Browse: Wyoming big sagebrush is the predominant browse species, and provides the majority of the cover (Table - Browse Trends). The sagebrush population is comprised of a moderately dense stand of mostly mature plants. Utilization was moderate to heavy in 1987 and 2011, but was light in the other sample years. Decadence was fairly high in 1994, but has been more moderate in the other sample years. Poor vigor was very high when the study was established in 1987, but has been more moderate in the other sample years. Recruitment of young sagebrush plants has generally been good, but was poor in 2011. The increaser species broom snakeweed (*Gutierrezia sarothrae*) is common on the site, but decreased substantially in 2011 (Table - Browse Characteristics).

Herbaceous Understory: Grasses are fairly diverse on the site, but are not particularly abundant. The warm season grasses blue grama (*Bouteloua gracilis*) and galleta (*Hilaria jamesii*) provide the majority of the grass cover. The annual species cheatgrass (*Bromus tectorum*) was abundant in 1999, but has been less common in other sample years. Forbs are not common on the site (Table - Herbaceous Trends).

Soil: The soil is in the Travessilla-Rock outcrop complex, which occurs on mesas and uplands. Parent material consists of eolian deposits derived from sandstone and/or residuum weathered from sandstone. These soils are characterized as shallow, well drained, and highly permeable (Soil Survey Staff 2011). Soils at the site are a reddish sandy loam with a neutral soil reaction (pH 7.2) (Table - Soil Analysis Data). Bare ground cover is high with only moderate amounts of vegetation and litter cover providing protective ground cover (Table - Basic Cover). The soil erosion condition was classified as stable in 2011.

### Trend Assessments

#### Browse:

- **1987 to 1994 - stable (0):** Differences in density may be related to the larger sample area used in 1994; therefore, trend was determined using other parameters. Decadence of Wyoming big sagebrush increased from 16% to 30%, but poor vigor decreased from 75% to 16%. Recruitment of young sagebrush plants decreased from 46% to 17%, but is still considered to be good.
- **1994 to 1999 - slightly up (+1):** The density of Wyoming big sagebrush increased 19% from 3,940 plants/acre to 4,680 plants/acre, though cover remained the same at 13%. Decadence decreased to 9%, and poor vigor decreased to 5%. Broom snakeweed increased substantially in density, but cover decreased from 3% to 2%.
- **1999 to 2011 - down (-2):** Wyoming big sagebrush density decreased by 29% to 3,300 plants/acre, but cover increased to 19%. Decadence increased to 16%, and poor vigor increased to 10%. Recruitment of young sagebrush plants decreased to just 2% of the population. There was a substantial decrease in the density of broom snakeweed, and cover decreased to less than 1%.

#### Grass:

- **1987 to 1994 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased 13%.

- **1994 to 1999 - slightly down (-1):** There was little change in the sum of nested frequency of perennial grasses, but cheatgrass increased significantly in nested frequency. Cover of cheatgrass increased from less than 1% to 5%.
- **1999 to 2011 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased 19%, and cover decreased from 6% to 5%. However, there was also a significant decrease in the nested frequency of cheatgrass, and cover decreased to less than 1%.

Forb:

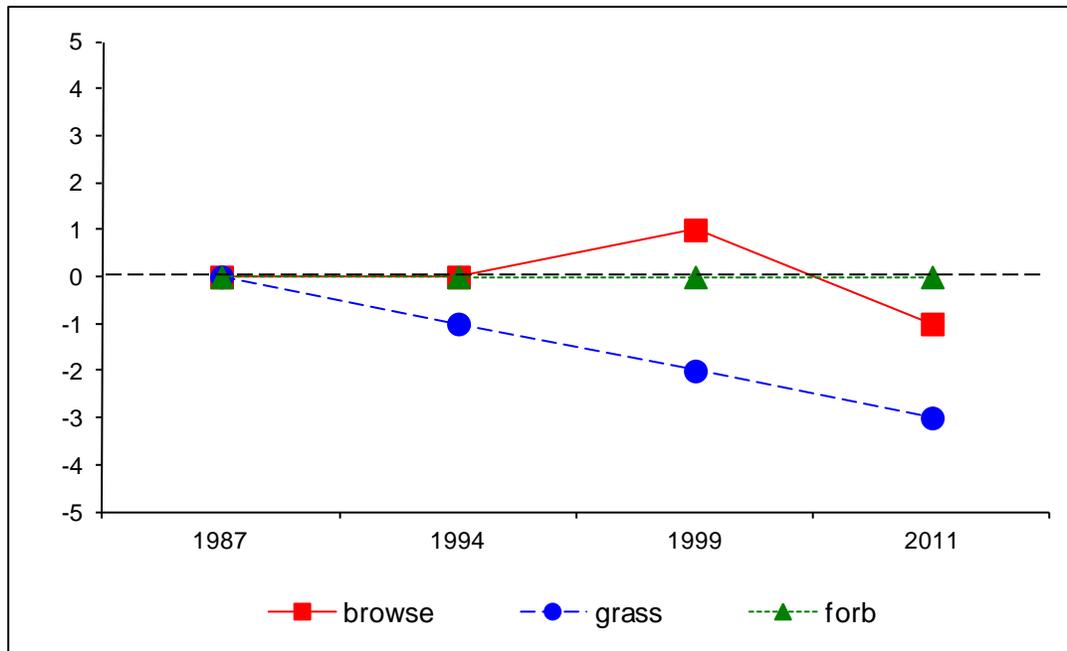
- **1987 to 1994 - stable (0):** Perennial forbs are rare on the site.
- **1994 to 1999 - stable (0):** Perennial forbs are rare on the site.
- **1999 to 2011 - stable (0):** Perennial forbs are rare on the site.

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 15, study no: 10

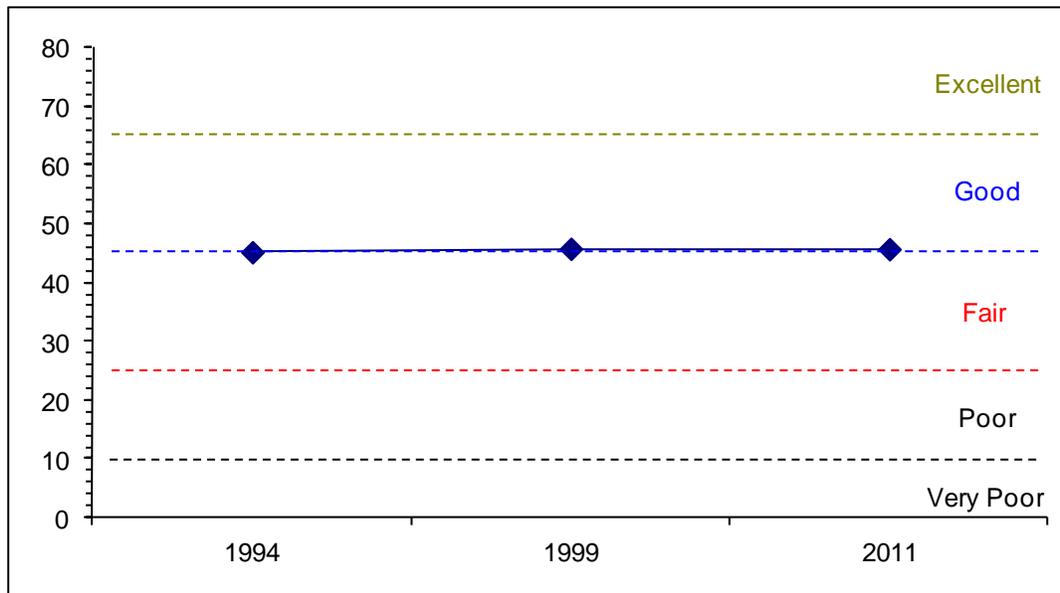
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
94	15.9	6.0	8.5	15.3	-0.6	0.1	0.0	<b>45.2</b>	Fair-Good
99	16.1	12.3	9.5	12.3	-4.4	0.0	0.0	<b>45.8</b>	Fair-Good
11	24.2	10.2	1.0	8.9	-0.3	1.8	0.0	<b>45.7</b>	Fair-Good

**Trend Summary**

CUMULATIVE RANGE TREND ASSESSMENT--  
Management unit 15 Study no: 10



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--  
 Management unit 15, Study no: 10



HERBACEOUS TRENDS--  
 Management unit 15, Study no: 10

Type	Species	Nested Frequency				Average Cover %		
		'87	'94	'99	'11	'94	'99	'11
G	<i>Agropyron cristatum</i>	-	2	-	-	.00	-	-
G	<i>Aristida purpurea</i>	-	5	-	-	.03	-	-
G	<i>Bouteloua gracilis</i>	c160	ab89	bc116	a60	4.40	3.56	1.01
G	<i>Bromus tectorum</i> (a)	-	b158	c264	a42	.43	4.57	.24
G	<i>Hilaria jamesii</i>	107	100	88	108	2.53	2.23	3.23
G	<i>Oryzopsis hymenoides</i>	14	13	13	7	.23	.08	.05
G	<i>Sitanion hystrix</i>	14	22	35	18	.13	.25	.13
G	<i>Sporobolus cryptandrus</i>	a-	b27	a3	ab13	.28	.01	.03
G	<i>Vulpia octoflora</i> (a)	-	c206	b163	a75	.38	1.27	.18
Total for Annual Grasses		0	364	427	117	0.82	5.84	0.42
Total for Perennial Grasses		295	258	255	206	7.63	6.13	4.46
Total for Grasses		295	622	682	323	8.45	11.98	4.89
F	<i>Astragalus</i> sp.	a-	a5	a2	b26	.01	.01	.85
F	<i>Cordylanthus</i> sp. (a)	-	-	-	3	-	-	.00
F	<i>Erodium cicutarium</i> (a)	-	6	-	-	.02	-	-
F	<i>Fritillaria atropurpurea</i>	-	3	-	-	.00	-	-
F	<i>Gilia</i> sp. (a)	-	a-	a-	b13	-	-	.03
F	<i>Lygodesmia</i> sp.	-	8	-	-	.02	-	-
F	<i>Phlox longifolia</i>	-	-	-	3	-	-	.00
F	<i>Plantago patagonica</i> (a)	a84	b147	c212	a84	.75	2.04	.19
F	<i>Sphaeralcea coccinea</i>	ab10	b11	a1	ab6	.03	.00	.02
Total for Annual Forbs		84	153	212	100	0.77	2.04	0.23
Total for Perennial Forbs		10	27	3	35	0.07	0.01	0.88

Type	Species	Nested Frequency				Average Cover %		
		'87	'94	'99	'11	'94	'99	'11
	Total for Forbs	94	180	215	135	0.84	2.06	1.11

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

#### BROWSE TRENDS--

Management unit 15, Study no: 10

Type	Species	Strip Frequency			Average Cover %		
		'94	'99	'11	'94	'99	'11
B	Artemisia tridentata wyomingensis	78	78	75	12.73	12.86	19.32
B	Atriplex canescens	0	1	0			
B	Atriplex confertifolia	2	0	0			
B	Chrysothamnus nauseosus	0	0	0			
B	Chrysothamnus viscidiflorus	0	1	0			
B	Coleogyne ramosissima	0	4	0			
B	Eriogonum microthecum	3	0	1			
B	Gutierrezia sarothrae	79	78	45	3.23	1.61	.40
B	Juniperus osteosperma	0	1	3	.03	.18	1.36
B	Opuntia sp.	13	25	33	1.08	1.14	2.91
	Total for Browse	175	188	157	17.07	15.80	23.99

#### CANOPY COVER, LINE INTERCEPT--

Management unit 15, Study no: 10

Species	Percent Cover '11
Artemisia tridentata wyomingensis	22.36
Gutierrezia sarothrae	.41
Juniperus osteosperma	1.76
Opuntia sp.	2.50

#### BASIC COVER--

Management unit 15, Study no: 10

Cover Type	Average Cover %			
	'87	'94	'99	'11
Vegetation	4.00	24.37	24.81	29.12
Rock	0	.06	.00	0
Pavement	0	.14	.28	.33
Litter	29.50	15.71	23.39	20.20
Cryptogams	0	.38	.04	.44
Bare Ground	66.50	51.41	48.55	62.07

PELLET GROUP DATA--

Management unit 15, Study no: 10

Type	Quadrat Frequency			Days use per acre (ha)	
	'94	'99	'11	'99	'11
Rabbit	24	36	7	-	-
Deer	6	18	52	4 (10)	92 (227)
Cattle/Bison	3	9	-	36 (89)	-

BROWSE CHARACTERISTICS--

Management unit 15, Study no: 10

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<i>Artemisia tridentata wyomingensis</i>									
87	<b>7065</b>	46	38	16	-	36	38	75	22/26
94	<b>3940</b>	17	53	30	1320	3	0	16	17/29
99	<b>4680</b>	19	71	9	80	29	10	5	19/33
11	<b>3300</b>	2	82	16	60	39	54	10	18/30
<i>Atriplex canescens</i>									
87	<b>0</b>	0	0	0	-	0	0	0	-/-
94	<b>0</b>	0	0	0	-	0	0	0	18/22
99	<b>20</b>	0	0	100	-	0	100	0	24/24
11	<b>0</b>	0	0	0	-	0	0	0	39/50
<i>Atriplex confertifolia</i>									
87	<b>0</b>	0	0	-	-	0	0	0	-/-
94	<b>40</b>	0	100	-	-	0	50	0	11/15
99	<b>0</b>	0	0	-	-	0	0	0	-/-
11	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Chrysothamnus nauseosus</i>									
87	<b>0</b>	0	0	-	-	0	0	0	-/-
94	<b>0</b>	0	0	-	20	0	0	0	-/-
99	<b>0</b>	0	0	-	-	0	0	0	-/-
11	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Chrysothamnus viscidiflorus</i>									
87	<b>0</b>	0	0	0	-	0	0	0	-/-
94	<b>0</b>	0	0	0	-	0	0	0	-/-
99	<b>20</b>	0	0	100	-	0	0	100	7/7
11	<b>0</b>	0	0	0	-	0	0	0	7/7
<i>Coleogyne ramosissima</i>									
87	<b>0</b>	0	0	-	-	0	0	0	-/-
94	<b>0</b>	0	0	-	-	0	0	0	-/-
99	<b>80</b>	100	0	-	-	0	25	0	19/29
11	<b>0</b>	0	0	-	-	0	0	0	-/-

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<i>Eriogonum microthecum</i>									
87	<b>0</b>	0	0	-	-	0	0	0	-/-
94	<b>60</b>	67	33	-	20	0	0	0	-/-
99	<b>0</b>	0	0	-	-	0	0	0	-/-
11	<b>20</b>	0	100	-	-	0	100	0	2/3
<i>Gutierrezia sarothrae</i>									
87	<b>4333</b>	17	74	9	-	0	0	3	8/8
94	<b>6740</b>	13	84	2	2160	0	0	1	8/11
99	<b>10000</b>	16	83	1	120	0	0	1	5/7
11	<b>1500</b>	4	96	0	80	0	0	0	8/9
<i>Juniperus osteosperma</i>									
87	<b>0</b>	0	0	-	-	0	0	0	-/-
94	<b>0</b>	0	0	-	-	0	0	0	-/-
99	<b>20</b>	100	0	-	-	0	0	0	-/-
11	<b>60</b>	67	33	-	-	0	0	0	-/-
<i>Opuntia sp.</i>									
87	<b>133</b>	0	100	0	-	0	0	0	6/10
94	<b>260</b>	15	69	15	20	0	0	23	6/34
99	<b>760</b>	21	55	24	20	3	0	26	5/25
11	<b>1080</b>	0	100	0	-	0	0	35	6/27