

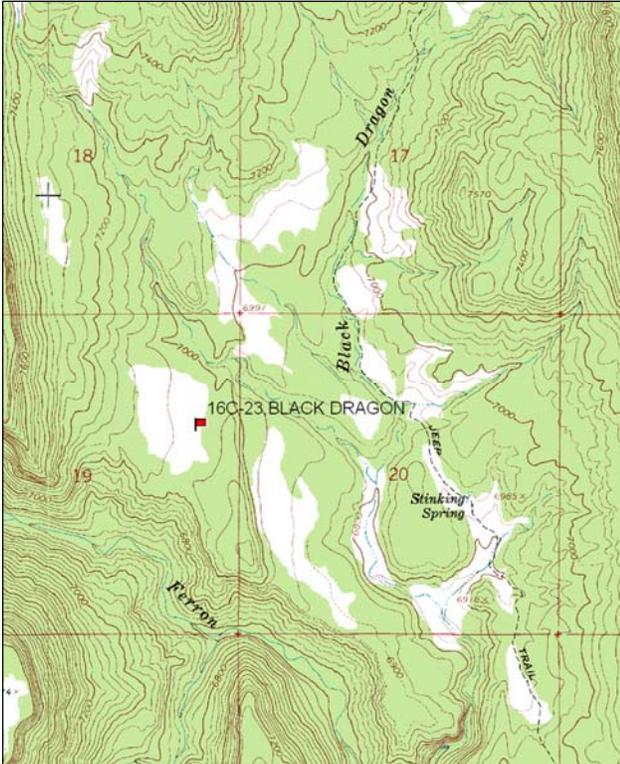
BLACK DRAGON - TREND STUDY NO. 16C-23-09

Vegetation Type: Mountain Big Sagebrush  
Range Type: Crucial Deer Winter, Substantial Elk Winter  
NRCS Ecological Site Description: Not Available  
Land Ownership: USFS  
Elevation: 7,000 ft (2,134 m)  
Aspect: South  
Slope: 5%  
Transect bearing: 239 degrees magnetic.  
Belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft)

Directions:

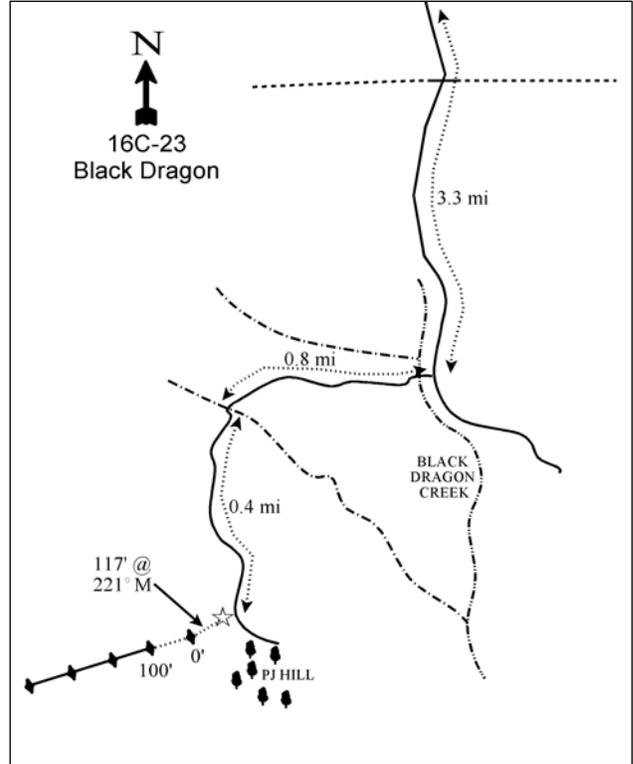
From the junction near the fence at the top of North Dragon Creek above Joes Valley, take the middle road (F.S. #170). Go down the Black Dragon trail 0.5 miles to a gate. Continue driving down the canyon 2.8 miles to a fork. Bear right across the creek. Proceed 0.8 miles through a chaining and down into a dry creek bottom. Cross and continue across a seeded sage flat for 0.4 miles to where the road turns to the left towards a P-J hill. There is a green fencepost on the right side of the road as a witness post. From the post, the 0-foot baseline stake is 117 feet bearing 221°M, and is marked by tag #484.

Map Name: Ferron Canyon



Township: 19S, Range: 6E, Section: 19

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 475481 E 4334124 N

## BLACK DRAGON - TREND STUDY NO. 16C-23

### Site Information

Site Description: The study is located between Joe's Valley and Ferron Canyon. The Black Dragon area is important winter range for deer and increasingly important for elk. Much of the pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) in the valley was chained and seeded a number of years ago. The study area is on a naturally open sagebrush flat that was not chained, but was contour-trenched and seeded in 1965. The site is now occupied primarily by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and seeded grasses. The area is managed as part of the Horn Mountain Allotment. Pellet group data estimated moderately heavy use by elk in 1999, but elk use was very heavy in 2009. Estimated deer use was moderate in 1999 and decreased to light use in 2004 and 2009. Estimated cattle use has been light since 1999 (Table - Pellet Group Data).

Browse: A small statured mountain big sagebrush is the key browse species, but there is likely some hybridization with black sagebrush (*Artemisia nova*). All sagebrush plants have been classified as mountain big sagebrush since 1994. The sagebrush population is dense, but healthy with low decadence, good vigor, and good recruitment of young plants in most sample years. Utilization of sagebrush has fluctuated between moderate and heavy use with the heaviest use in 1999 and 2009. Stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*) co-dominates the site and has a very high density. The only other browse species that occurs in notable numbers is the palatable browse species winterfat (*Ceratoides lanata*). Winterfat has shown heavy use, but has maintained low decadence and good vigor (Table - Browse Characteristics).

Herbaceous Understory: Grasses are fairly diverse and abundant, but are dominated by the seeded species crested wheatgrass (*Agropyron cristatum*). It is especially dense within the contour furrows. The native species needle-and-thread (*Stipa comata*), bluebunch wheatgrass (*Agropyron spicatum*), bottlebrush squirreltail (*Sitanion hystrix*), and Indian ricegrass (*Oryzopsis hymenoides*) have decreased over the course of the study, and are now only rare. Forbs are not very diverse, are rare, and produce little useful forage. The most common species include longleaf phlox (*Phlox longifolia*) and scarlet globemallow (*Sphaeralcea coccinea*) (Table - Herbaceous Trends).

Soil: The soil is a fine-textured sandy clay loam with a neutral pH (Table - Soil Analysis Data). At intervals of 30 to 40 feet, there are contour-furrows which have effectively eliminated most problems from erosion. There is moderately high bare ground cover, especially on the top edges of the furrows, but herbaceous vegetation, litter, and pavement cover provide some good protective ground cover. The soil erosion condition was classified as stable in 2004 and 2009.

### Trend Assessments

#### Browse:

- **1988 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. The mountain big sagebrush characteristics still show a healthy population.
- **1994 to 1999 - slightly up (+1):** The density of mountain big sagebrush increased by 12% from 9,040 plants/acre to 10,180 plants/acre, though much of the increase was due to a large increase in young plants. The density of mature sagebrush plants decreased slightly. The cover of sagebrush increased from 6% to 8%, but the undesirable species, stickyleaf low rabbitbrush also had an increase in cover from 8% to 10%.
- **1999 to 2004 - up (+2):** Mountain big sagebrush density increased by 31% to 13,380 plants/acre and cover increased to 12%. Mountain big sagebrush now provides more cover than stickyleaf low rabbitbrush. Recruitment of young sagebrush plants decreased to only 3% of the population.

- **2004 to 2009 - slightly up (+1):** Density of mountain big sagebrush increased by 12% to 15,080 plants/acre with a large increase in the recruitment of young plants. Cover of sagebrush remained similar.

Grass:

- **1988 to 1994 - stable (0):** There was little change in the sum of nested frequency of perennial grasses, though there was a slight change in composition. There was a significant decrease in the nested frequency of the seeded species intermediate wheatgrass (*Agropyron intermedium*) and a significant increase in Indian ricegrass.
- **1994 to 1999 - stable (0):** Perennial grass sum of nested frequency decreased by 9% and cover decreased from 13% to 10%. There was a significant decrease in the nested frequency of Indian ricegrass and a significant increase in bottlebrush squirreltail.
- **1999 to 2004 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 18%, though cover increased slightly. There was a significant decrease in the nested frequency of bottlebrush squirreltail and needle-and-thread has had a decreased significantly since 1999.
- **2004 to 2009 - stable (0):** There was little change in the sum of nested frequency of perennial grasses, but composition changed slightly. There was a significant increase in the nested frequency of crested wheatgrass and a significant decrease in needle-and-thread. Native perennial grasses are rare on the site now.

Forb:

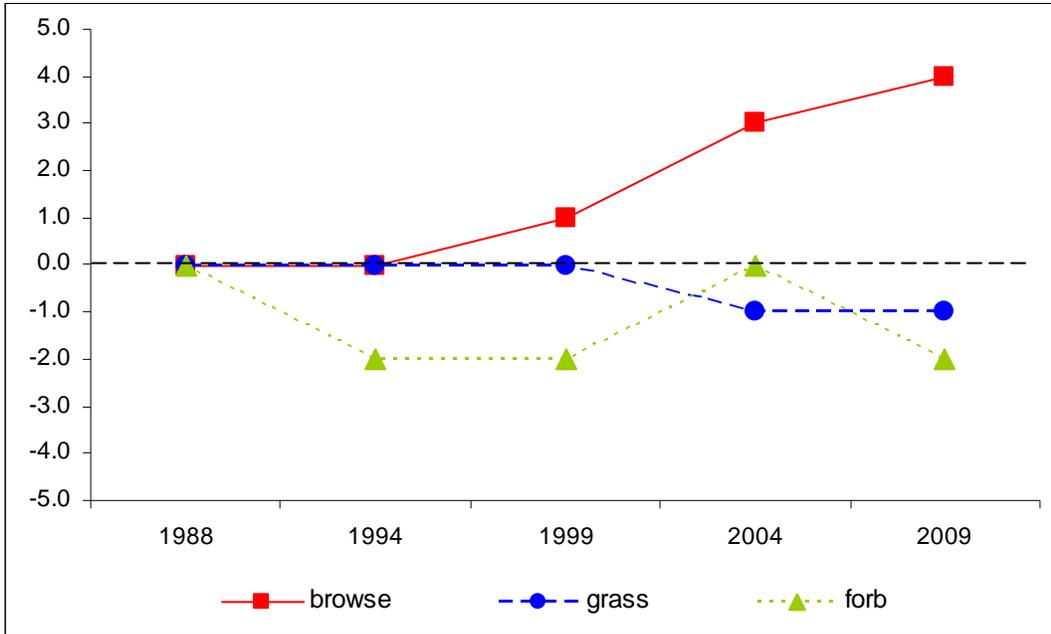
- **1988 to 1994 - down (-2):** There was a 68% decrease in the sum of nested frequency of perennial forbs with significant decreases in the nested frequency of many of the perennial forb species.
- **1994 to 1999 – stable (0):** The sum of nested frequency of perennial forbs decreased, but cover remained similar and no species changed significantly in nested frequency.
- **1999 to 2004 - up (+2):** There was a three-fold increase in the sum of nested frequency of perennial forbs and cover increased from less than 1% to near 2%. Most of the change came from a significant increase in the nested frequency of longleaf phlox and a substantial increase in cover of that species.
- **2004 to 2009 - down (-2):** Perennial forb sum of nested frequency decreased by 48% and cover decreased to less than 1%. There was a significant decrease in the nested frequency of longleaf phlox.

DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --  
Management unit 16C, study no: 23

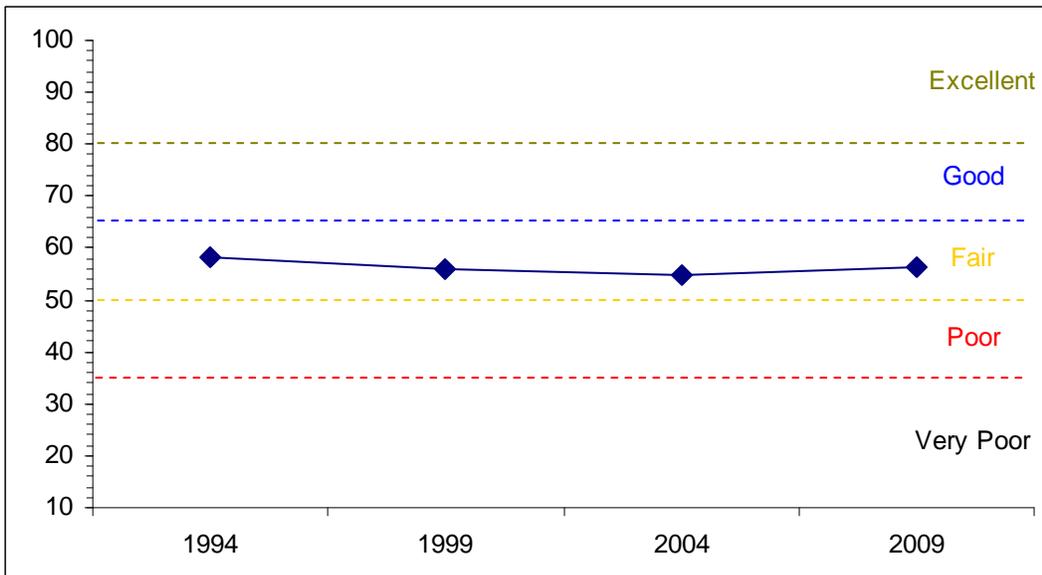
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
94	7.4	10.3	13.8	25.9	0.0	0.8	0.0	<b>58.2</b>	Fair
99	9.9	10.6	15.0	19.8	0.0	0.9	0.0	<b>56.1</b>	Fair
04	15.5	12.9	1.8	21.4	0.0	3.2	0.0	<b>54.9</b>	Fair
09	15.3	9.9	15.0	14.9	0.0	1.1	0.0	<b>56.3</b>	Fair

## Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--  
Management unit 16C Study no: 23



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL  
Management unit 16C, Study no: 23



HERBACEOUS TRENDS--

Management unit 16C, Study no: 23

Type	Species	Nested Frequency					Average Cover %			
		'88	'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron cristatum	ab256	a234	ab245	a232	b280	7.96	6.82	9.41	6.78
G	Agropyron intermedium	b63	a4	a8	a8	a4	.03	.07	.10	.03
G	Agropyron spicatum	6	6	16	2	-	.16	.45	.06	-
G	Bouteloua gracilis	a-	b31	b27	b25	b26	.90	.93	.61	.57
G	Oryzopsis hymenoides	b51	c77	a20	ab29	a10	1.24	.33	.22	.04
G	Sitanion hystrix	ab17	b29	c49	ab11	a1	.30	.55	.04	.03
G	Sporobolus cryptandrus	-	1	4	1	-	.03	.01	.00	-
G	Stipa comata	bc50	c78	bc48	b33	a-	2.33	.71	.24	-
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		443	460	417	341	321	12.97	9.90	10.69	7.46
Total for Grasses		443	460	417	341	321	12.97	9.90	10.69	7.46
F	Arabis sp.	-	-	-	4	-	-	-	.03	-
F	Astragalus calycosus	b19	a2	ab7	b27	a-	.01	.03	.06	-
F	Calochortus nuttallii	3	-	1	-	1	-	.00	-	.00
F	Chenopodium leptophyllum(a)	-	a6	a-	b58	a-	.01	-	.18	-
F	Descurainia pinnata (a)	-	-	-	-	2	-	-	.00	.01
F	Erigeron pumilus	b21	a-	ab8	ab4	b14	-	.07	.01	.06
F	Lappula occidentalis (a)	-	a-	a-	b8	a-	-	-	.02	-
F	Machaeranthera canescens	b37	a4	a3	a7	a5	.01	.06	.02	.03
F	Microsteris gracilis (a)	-	-	3	4	8	-	.00	.01	.01
F	Phlox longifolia	c164	ab50	a17	c142	b58	.15	.06	.78	.34
F	Senecio multilobatus	1	-	-	-	-	-	-	-	-
F	Sphaeralcea coccinea	66	44	45	64	50	.24	.22	.68	.12
F	Unknown forb-perennial	1	-	-	-	-	-	-	-	-
Total for Annual Forbs		0	6	3	70	10	0.01	0.00	0.22	0.02
Total for Perennial Forbs		312	100	81	248	128	0.41	0.45	1.60	0.57
Total for Forbs		312	106	84	318	138	0.42	0.46	1.83	0.59

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

BROWSE TRENDS--

Management unit 16C, Study no: 23

Type	Species	Strip Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
B	Artemisia tridentata vaseyana	95	96	94	99	5.84	7.78	12.13	12.18
B	Ceratoides lanata	17	16	18	19	.09	.12	.28	.09
B	Chrysothamnus depressus	0	0	0	1	-	-	-	.00
B	Chrysothamnus viscidiflorus viscidiflorus	95	92	93	88	7.64	10.25	7.76	5.94
B	Opuntia sp.	7	13	12	7	.04	.01	.01	.00
B	Pinus edulis	0	0	0	1	-	-	-	.00
B	Sclerocactus sp.	0	0	1	0	-	-	.00	-
Total for Browse		214	217	218	215	13.62	18.17	20.19	18.23

CANOPY COVER, LINE INTERCEPT--

Management unit 16C, Study no: 23

Species	Percent Cover	
	'04	'09
Artemisia tridentata vaseyana	12.58	12.55
Ceratoides lanata	.13	.08
Chrysothamnus viscidiflorus viscidiflorus	5.90	3.09
Opuntia sp.	.03	.01
Pinus edulis	.06	.03

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 16C, Study no: 23

Species	Average leader growth (in)	
	'04	'09
Artemisia tridentata vaseyana	1.6	0.8

BASIC COVER--

Management unit 16C, Study no: 23

Cover Type	Average Cover %				
	'88	'94	'99	'04	'09
Vegetation	6.75	24.96	27.18	31.84	27.52
Rock	.75	4.69	.76	1.27	.25
Pavement	10.00	.74	7.55	7.59	8.38
Litter	37.25	19.30	17.26	23.89	24.76
Cryptogams	1.00	.08	.11	1.31	.74
Bare Ground	44.25	37.02	40.47	45.37	42.27

SOIL ANALYSIS DATA --

Management unit 16C, Study no: 23, Study Name: Black Dragon

Effective rooting depth (in)	pH	sandy clay loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
11.4	7.1	57.4	16.7	25.8	1.7	6.9	60.8	0.7

PELLET GROUP DATA--

Management unit 16C, Study no: 23

Type	Quadrat Frequency				Days use per acre (ha)		
	'94	'99	'04	'09	'99	'04	'09
Rabbit	36	14	31	38	-	-	-
Elk	29	44	41	43	53 (131)	50 (124)	92 (227)
Deer	38	22	23	7	40 (99)	17 (43)	3 (8)
Cattle	4	2	2	3	10 (25)	11 (27)	7 (16)

BROWSE CHARACTERISTICS--

Management unit 16C, Study no: 23

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 nova</i>									
88	<b>199</b>	33	67	-	-	0	0	33	6/15
94	<b>0</b>	0	0	-	-	0	0	0	-/-
99	<b>0</b>	0	0	-	-	0	0	0	-/-
04	<b>0</b>	0	0	-	-	0	0	0	-/-
09	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Artemisia tridentata vaseyana</i>									
88	<b>49798</b>	90	5	6	4333	3	6	1	8/12
94	<b>9040</b>	28	56	16	-	19	.66	7	9/18
99	<b>10180</b>	54	31	15	320	18	74	4	11/22
04	<b>13380</b>	3	90	7	22560	46	12	4	12/19
09	<b>15080</b>	35	48	17	11040	15	49	13	9/18
<i>Ceratoides lanata</i>									
88	<b>1465</b>	14	86	0	-	36	59	0	4/3
94	<b>520</b>	8	92	0	-	19	0	0	3/4
99	<b>620</b>	3	97	0	-	74	13	0	7/7
04	<b>580</b>	10	90	0	200	7	83	0	6/7
09	<b>580</b>	7	86	7	-	24	41	7	4/5
<i>Chrysothamnus depressus</i>									
88	<b>0</b>	0	0	0	-	0	0	0	-/-
94	<b>0</b>	0	0	0	-	0	0	0	-/-
99	<b>0</b>	0	0	0	-	0	0	0	-/-
04	<b>0</b>	0	0	0	-	0	0	0	-/-
09	<b>20</b>	0	0	100	-	0	0	0	3/11
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
88	<b>13932</b>	84	16	0	1933	1	0	0	5/8
94	<b>18780</b>	12	88	0	-	0	0	0	4/9
99	<b>19680</b>	7	93	0	80	7	.20	0	6/12
04	<b>13300</b>	1	97	2	1320	.30	0	2	5/9
09	<b>14420</b>	18	69	13	280	0	0	13	3/10

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Gutierrezia sarothrae</i>										
88	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	6/7	
<i>Opuntia sp.</i>										
88	998	53	40	7	133	0	0	27	3/7	
94	140	0	100	0	-	0	0	0	3/6	
99	300	13	80	7	-	0	0	7	3/14	
04	280	21	71	7	20	0	0	7	2/9	
09	300	27	60	13	-	0	0	20	2/8	
<i>Pinus edulis</i>										
88	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	20	0	0	0	-/-	
09	20	100	0	-	-	0	0	100	-/-	
<i>Sclerocactus sp.</i>										
88	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	-/-	
04	20	0	100	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	