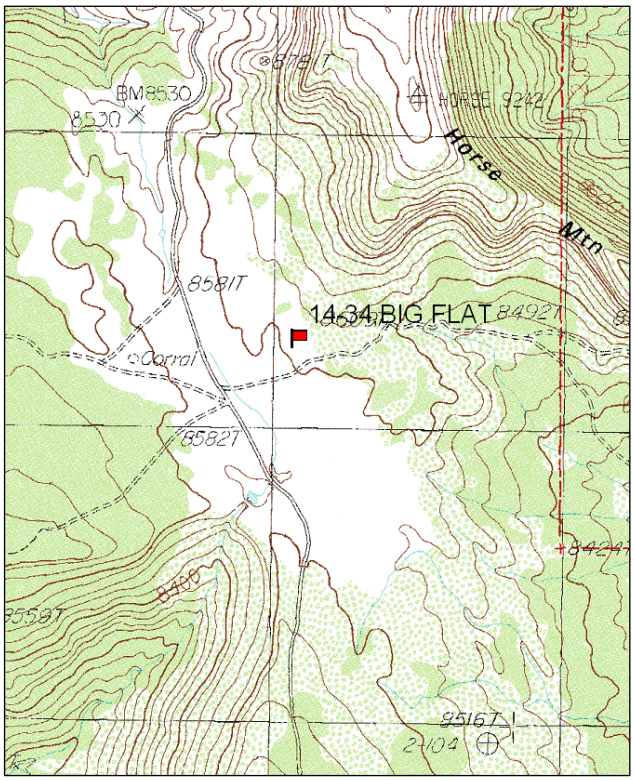
BIG FLAT - TREND STUDY NO. 14-34-09

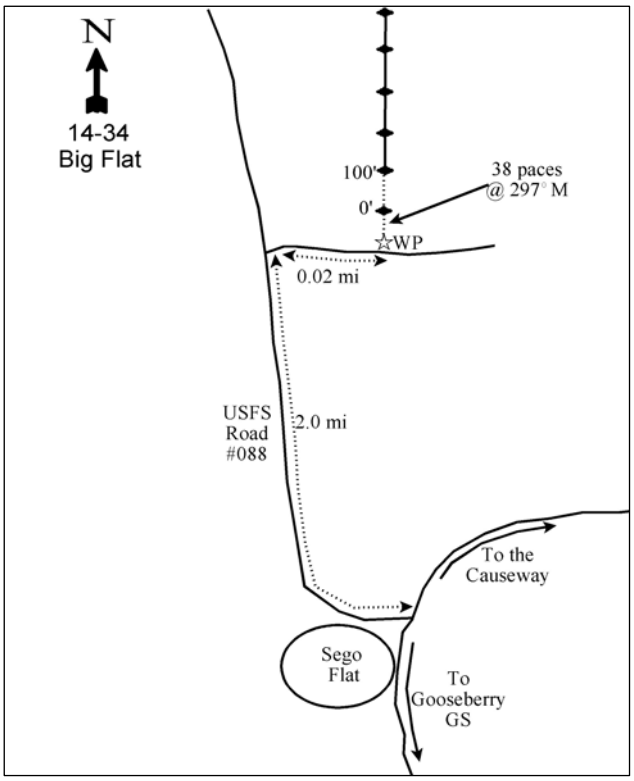
Vegetation Type: Mountain Big Sagebrush
Range Type: Crucial Deer Summer, Crucial Elk Summer
NRCS Ecological Site Description: Not Available
Land Ownership: USFS
Elevation: 8,600 ft (2,621 m)
Aspect: Southwest
Slope: 2%
Transect bearing: 322 degrees magnetic
Belt placement: line 1(11 ft), line 2(34 ft), line 3(59 ft), line 4(71 ft), line 5(95 ft)

Directions:
From the Kigalia Guard Station travel north about 1.2 miles to Sego Flat. From Sego Flat travel 2.0 miles north. Take a right onto a faint road and drive 0.2 miles to a witness post on the left. The beginning of the frequency baseline is 38 paces away at 297°M. The 0-foot stake is marked with a browse tag #152.

Map name: Poison Canyon



Diagrammatic Sketch:



Township: 33S, Range: 19E, Section: Unsurveyed

GPS: NAD 83, UTM 12S 607009 E 4191476 N

BIG FLAT - TREND STUDY NO. 14-34

Site Information

Site Description: The study is located on the northern end of Elk Ridge, just south of Horse Mountain. The study area is a mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and grass flat with a few large, mature Gambel oak (*Quercus gambelii*) clones surrounding and intermixed on the site. This study was located near a clipping study that the Range Trend Project monitored in the past to determine use of elk and cattle. Between 1999 and 2002 pellet group transects found an average of 29 elk days use/acre (72 edu/ha), 15 cow days use/acre (37 cdu/ha), and 9 deer days/use acre (21 ddu/ha). Production of available forage varied between 1,550 lbs/acre in 1999 and 251 lbs/acre in 2002. Total use was lowest in 1999 at 48% and highest in 2002 at 80%. Pellet group data has indicated fairly light use by deer and light to moderate use by elk since 2004. Estimated cattle use has been lightly moderate since 2004 (Table - Pellet Group Data). Cattle were on the site at the time of sampling in 2009.

Browse: Mountain big sagebrush is the most dominant in cover on the site providing over 90% of the browse cover since 2004 (Table - Browse Trends). Density of sagebrush was very high at the outset of the study in 2004, due to an abundance of young sagebrush plants. Sagebrush density decreased in 2009 because of a decrease in recruitment of young plants, but the population remains healthy with good vigor, low decadence, and high recruitment of young plants. Utilization of sagebrush has been mostly light to moderate, with some heavy use noted in 2009 (Table - Browse Characteristics).

Herbaceous Understory: The herbaceous understory is dominated by two introduced grasses, smooth brome (*Bromus inermis*) and Kentucky bluegrass (*Poa pratensis*). Together they produce nearly all of the grass cover on the site. Both are sod forming grasses that are resistant to grazing. Native grasses are quite rare here. Forbs are diverse and abundant with some of the more common species being western yarrow (*Achillea millefolium*), ballhead sandwort (*Arenaria congesta*), aster (*Aster sp.*), peavine (*Lathryrus sp.*), and silvery lupine (*Lupinus argenteus*).

Soil: The soil is a clay loam with a neutral pH and moderately deep effective rooting depth (Table - Soil Analysis Data). Bare ground cover has been moderately high for a summer range, but litter and vegetation cover provide good protective cover (Table - Basic Cover). The soil erosion condition was classified as stable in 2004 and 2009.

Trend Assessments

Browse:

- **2004 to 2009 - stable (0):** There was a 29% decrease in the total density of the primary browse species, mountain big sagebrush, but most of the decrease is due to a decrease in young plants. The density of mature sagebrush plants actually increased by 29% and recruitment of young sagebrush plants remained good. Decadence and poor vigor remained good in the sagebrush population.

Grass:

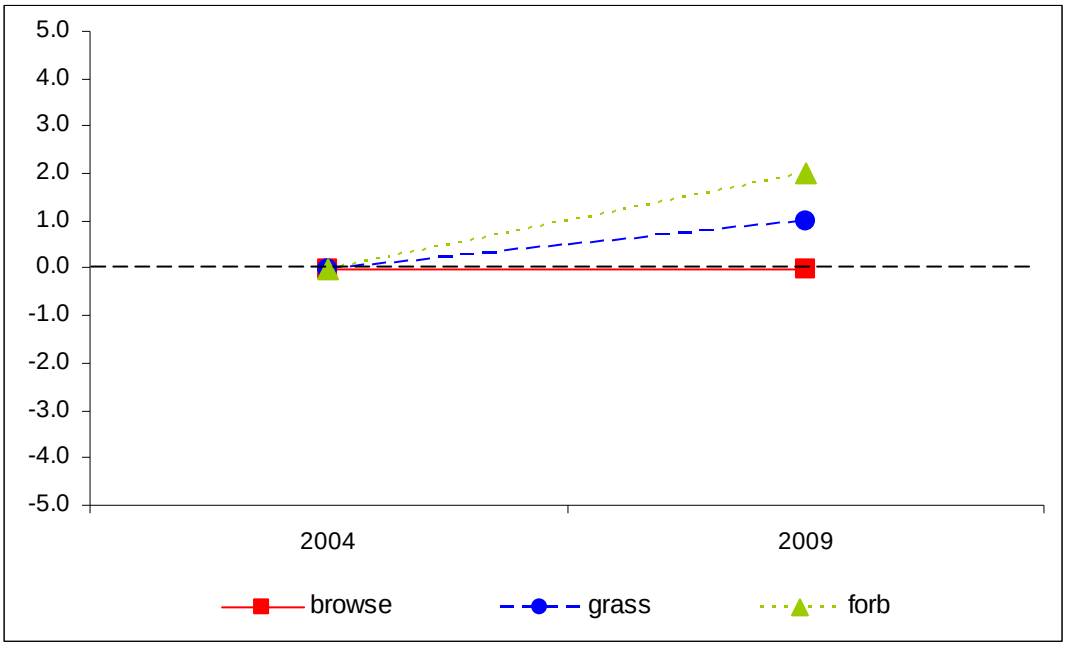
- **2004 to 2009 - slightly up (+1):** There was a 15% increase in the sum of nested frequency of perennial grasses and cover increased from 12% to 25%. There was a significant increase in the nested frequency of the two dominant grasses, smooth brome and Kentucky bluegrass.

Forb:

- **2004 to 2009 - up (+2):** The sum of nested frequency of perennial forbs increased by 32% and cover increased from 10% to 22%. There was a significant increase in many of the perennial forbs including peavine and silvery lupine.

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 14, Study no: 34



HERBACEOUS TRENDS--
Management unit 14, Study no: 34

Type	Species	Nested Frequency '04	Nested Frequency '09	Average Cover % '04	Average Cover % '09
G	Agropyron intermedium	13	5	.03	.03
G	Bromus inermis	[a]246	[b]273	6.09	9.55
G	Carex sp.	4	3	.06	.00
G	Dactylis glomerata	-	4	-	.15
G	Elymus junceus	-	3	-	.00
G	Poa fendleriana	-	6	-	.06
G	Poa pratensis	[a]254	[b]301	6.05	15.03
G	Sitanion hystrix	1	-	.00	-
G	Stipa columbiana	-	1	-	.03
Total for Annual Grasses		0	0	0	0
Total for Perennial Grasses		518	596	12.24	24.87
Total for Grasses		518	596	12.24	24.87
F	Achillea millefolium	86	111	2.13	5.10
F	Agoseris glauca	2	3	.00	.21
F	Androsace septentrionalis (a)	-	4	-	.01
F	Antennaria rosea	6	7	.06	.21
F	Arenaria congesta	[a]81	[b]108	1.37	2.50
F	Artemisia ludoviciana	3	4	.01	.03
F	Aster sp.	[a]67	[b]132	1.23	3.21
F	Collinsia parviflora (a)	9	1	.01	.00

Type	Species	Nested Frequency '04	Nested Frequency '09	Average Cover % '04	Average Cover % '09
F	Cordylanthus sp. (a)	-	4	-	.03
F	Crepis acuminata	3	-	.01	-
F	Cymopterus sp.	17	12	.14	.63
F	Delphinium nuttallianum	-	4	-	.01
F	Erigeron flagellaris	$_{b}$97	$_{a}$63	1.87	.53
F	Eriogonum racemosum	26	24	.31	.71
F	Heterotheca villosa	9	6	.54	.53
F	Lathyrus sp.	$_{a}$6	$_{b}$35	.01	2.34
F	Lupinus argenteus	$_{a}$26	$_{b}$84	1.70	3.75
F	Lupinus polyphyllus	8	13	.16	.33
F	Microsteris gracilis (a)	$_{a}$-	$_{b}$19	-	.05
F	Navarretia breweri (a)	-	3	-	.00
F	Penstemon humilis	$_{a}$2	$_{b}$19	.03	.35
F	Penstemon strictus	2	6	.03	.21
F	Phlox longifolia	$_{b}$43	$_{a}$8	.33	.04
F	Polygonum douglasii (a)	4	17	.01	.03
F	Potentilla concinna	7	3	.15	.18
F	Taraxacum officinale	2	14	.01	.47
F	Tragopogon dubius	1	5	.00	.06
F	Vicia americana	11	5	.02	.24
Total for Annual Forbs		13	48	0.03	0.13
Total for Perennial Forbs		505	666	10.19	21.71
Total for Forbs		518	714	10.22	21.85

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

BROWSE TRENDS--
Management unit 14, Study no: 34

Type	Species	Strip Frequency '04	Strip Frequency '09	Average Cover % '04	Average Cover % '09
B	Artemisia tridentata vaseyana	88	89	19.36	23.09
B	Quercus gambelii	3	4	.00	.03
B	Rosa woodsii	4	1	.03	.00
B	Symphoricarpos oreophilus	16	17	.78	1.42
Total for Browse		111	111	20.18	24.55

CANOPY COVER, LINE INTERCEPT--
Management unit 14, Study no: 34

Species	Percent Cover '04	Percent Cover '09
Artemisia tridentata vaseyana	25.03	24.33
Quercus gambelii	1.39	.36
Rosa woodsii	.13	-
Symphoricarpos oreophilus	2.33	2.04

KEY BROWSE ANNUAL LEADER GROWTH--
Management unit 14, Study no: 34

Species	Average leader growth (in)	
	'04	'09
Artemisia tridentata vaseyana	2.0	2.2

BASIC COVER--
Management unit 14, Study no: 34

Cover Type	Average Cover %	
	'04	'09
Vegetation	45.00	58.90
Rock	.38	.00
Pavement	.12	.05
Litter	33.32	35.87
Cryptogams	.15	.15
Bare Ground	33.60	25.11

SOIL ANALYSIS DATA --
Management unit 14, Study no: 34, Study Name: Big Flat

Effective rooting depth (in)	pH	clay loam			%0M	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
16.4	6.8	23.9	44.2	31.8	3.6	18.5	249.6	0.8

PELLET GROUP DATA--
Management unit 14, Study no: 34

Type	Quadrat Frequency		Days use per acre (ha)	
	'04	'09	'04	'09
Rabbit	-	3	-	-
Elk	15	5	32 (79)	17 (43)
Deer	12	4	16 (40)	13 (31)
Cattle	10	11	26 (65)	34 (84)

BROWSE CHARACTERISTICS--
Management unit 14, Study no: 34

		Age class distribution				Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Artemisia tridentata vaseyana									
04	**12380**	60	37	3	11940	22	2	.48	21/32
09	**8800**	22	67	11	2780	33	14	8	18/36
Ceanothus fendleri									
04	**0**	0	0	-	-	0	0	0	13/42
09	**0**	0	0	-	-	0	0	0	-/-
Mahonia repens									
04	**0**	0	0	-	-	0	0	0	4/8
09	**0**	0	0	-	-	0	0	0	-/-
Quercus gambelii									
04	**80**	50	50	0	-	50	0	0	13/16
09	**260**	46	46	8	-	8	8	0	11/16
Rosa woodsii									
04	**120**	0	100	-	-	0	0	0	14/12
09	**40**	100	0	-	-	0	0	0	-/-
Symphoricarpos oreophilus									
04	**600**	17	83	0	-	17	0	0	15/25
09	**840**	17	81	2	-	2	2	0	18/18