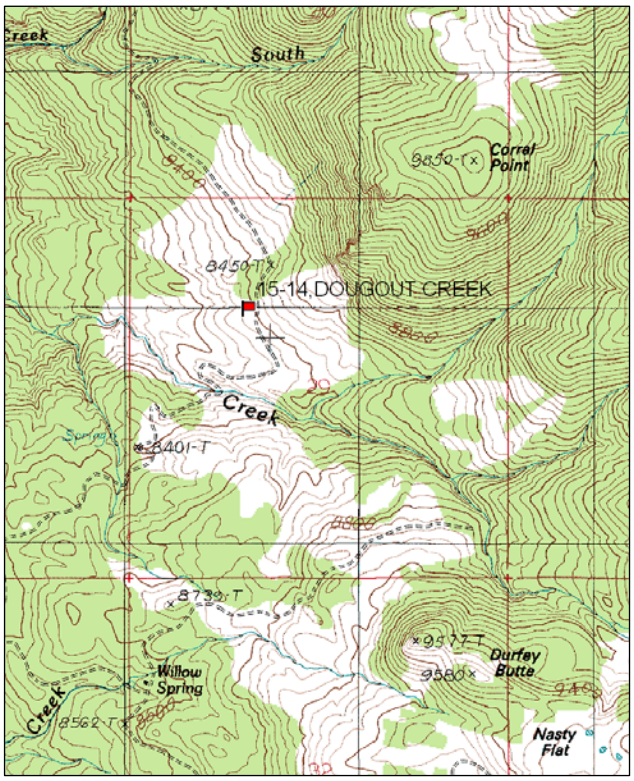
DUGOUT CREEK - TREND STUDY NO. 15-14-09

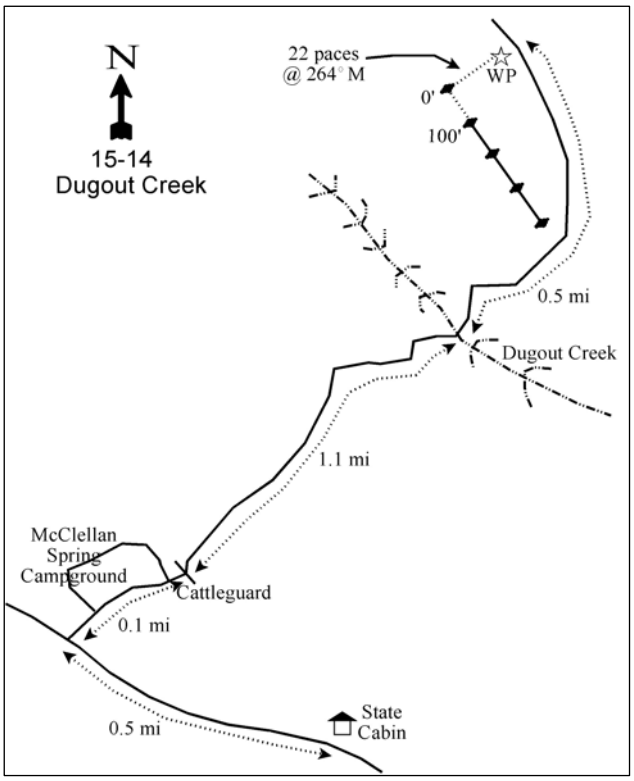
Vegetation Type: Mountain Big Sagebrush
Range Type: Crucial Deer Winter
NRCS Ecological Site Description: Not Available
Land Ownership: BLM
Elevation: 8,300 ft (2,530 m)
Aspect: southeast
Slope: 10%-15%
Transect bearing: 140°M-lines 1-2; 145°M-line 3; 140°M-line 4
Belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft)

Directions:
From the DWR State Cabin travel north-west toward McClellan Spring for 0.5 miles. Turn right onto the road passing McClellan Spring Campground. Travel 0.1 miles to a cattleguard. Cross the cattleguard and continue 1.1 miles to Dugout Creek. Continue 0.5 miles past the creek to a witness post on the left hand side of the road. The beginning of the baseline is 22 paces from the witness post at 264°M. The 0-foot stake is marked with browse tag #153.

Map Name: Mount Ellen



Diagrammatic Sketch:



Township: 31S, Range: 10E, Section: 29

GPS: NAD 83, UTM 12S 514442 E 4215166 N

DUGOUT CREEK - TREND STUDY NO. 15-14

Site Information

Site Description: The study is located on a sagebrush flat that is surrounded by scattered pinyon pine (*Pinus edulis*), juniper (*Juniperus spp.*), and Gambel oak (*Quercus gambelii*). The northern end of the site is dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), but transitions to a black sagebrush (*A. nova*) community as you move south across the transect. The site lies within the Nasty Flat Cattle Allotment. Water is available for livestock and wildlife within one-quarter mile of the study site. Pellet group data for bison and cattle were combined due to difficulties in differentiating between these species. Pellet group data indicates light use by bison/cattle since 2004. Estimated deer use was moderately heavy in 2004 and very heavy in 2009 (Table - Pellet Group Data).

Browse: Mountain big sagebrush and black sagebrush are the key browse species in the area. These two species comprise the majority of the browse cover on the site (Table - Browse Trends). Both species populations are comprised of a good mixture of young and mature plants. Mountain big sagebrush density increased dramatically from 2004 to 2009, mostly due to a large increase of young plants. Decadence of black sagebrush is somewhat high, but improved from 2004 to 2009. Utilization of both mountain big and black sagebrush has been mostly light since 2004, with some moderate use of mountain big sagebrush in 2004 (Table - Browse Characteristics).

Other preferred browse species sampled were Utah serviceberry (*Amelanchier utahensis*) and Gambel oak Serviceberry is an important species, but is not very abundant and Gambel oak shows little to no use. Pinyon pine, Utah juniper (*Juniperus osteosperma*), Rocky Mountain juniper (*J. scopulorum*), and limber pine (*Pinus flexilis*) are present in low cover and abundance (Table - Browse Trends, Table - Browse Characteristics).

Herbaceous Understory: The grasses on the site fairly abundant, but not very diverse. Slender wheatgrass (*Agropyron trachycaulum*) is the dominant perennial grass on the site occurring in the greatest frequency and cover. However, cheatgrass (*Bromus tectorum*) is also present on the site, but has decreased significantly in nested frequency and decreased in cover since 2004. Other common perennial grasses include mutton bluegrass (*Poa fendleriana*) and bottlebrush squirreltail (*Sitanion hystrix*). Forbs are fairly diverse on the site, but not very abundant. The dominant forbs in cover and frequency on the site are dandelion (*Taraxacum officinale*), false dandelion (*Agoseris glauca*), and hoary aster (*Machaeranthera canescens*) (Table - Herbaceous Trends).

Soil: The soil is brown, clay loam with a neutral pH and a fairly deep effective rooting depth (Table - Soil Analysis Data). Protective cover is provided by good vegetation and litter cover which keeps bare ground cover low (Table - Basic Cover). The soil erosion condition was classified as stable in 2004 and 2009. Some of the steeper slopes surrounding the site show more erosion.

Trend Assessments

Browse:

- **2004 to 2009 - up (+2):** There was a three-fold increase in the density of mountain big sagebrush, though most of this increase is due to a large increase in young plants. The density of mature mountain big sagebrush increased 55% from 2,300 mature plants/acre to 3,580 mature plants/acre. The density of black sagebrush increased 23%, also primarily due to a large increase in young plants. There was little change in the density of mature black sagebrush plants, though decadent plants decreased. Density of serviceberry also increased due to an increase in young plants.

Grass:

- **2004 to 2009 - up (+2):** The sum of nested frequency of perennial grasses increased by 15% and cover increased from 4% to 9%. There was a significant decrease in the nested frequency of cheatgrass and cover decreased from 10% to 1%. There was a significant increase in the nested frequency of slender wheatgrass.

Forb:

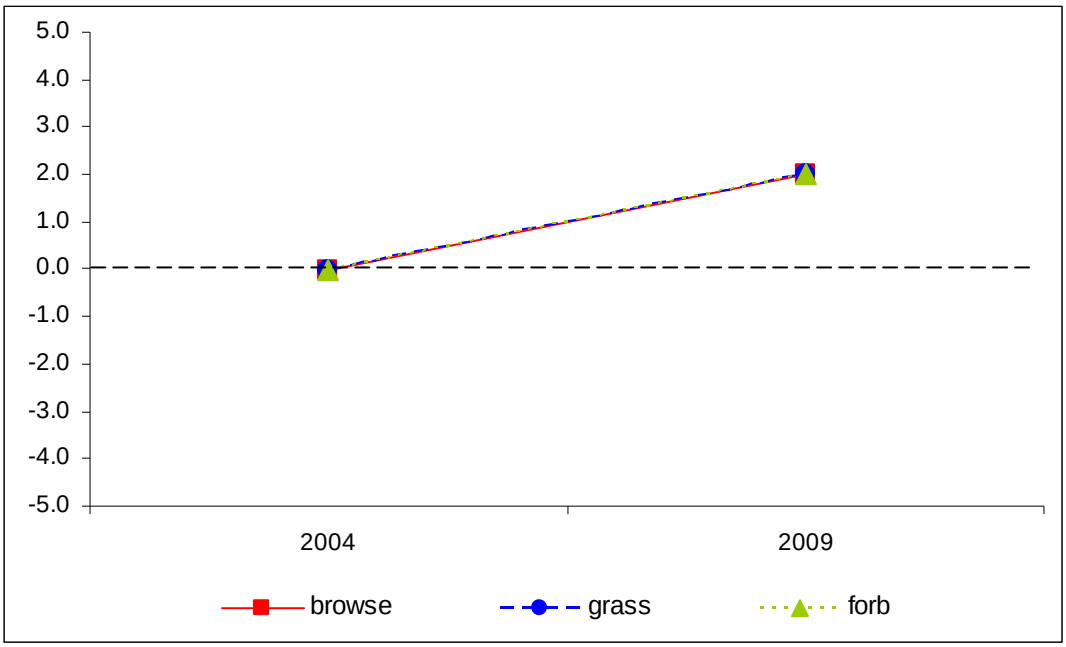
- **2004 to 2009 - up (+2):** The sum of nested frequency of perennial forbs increased by 56% and cover increased from 2% to 5%. There was a significant increase in the nested frequency of many important perennial forb species.

DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --
Management unit 15, study no: 14

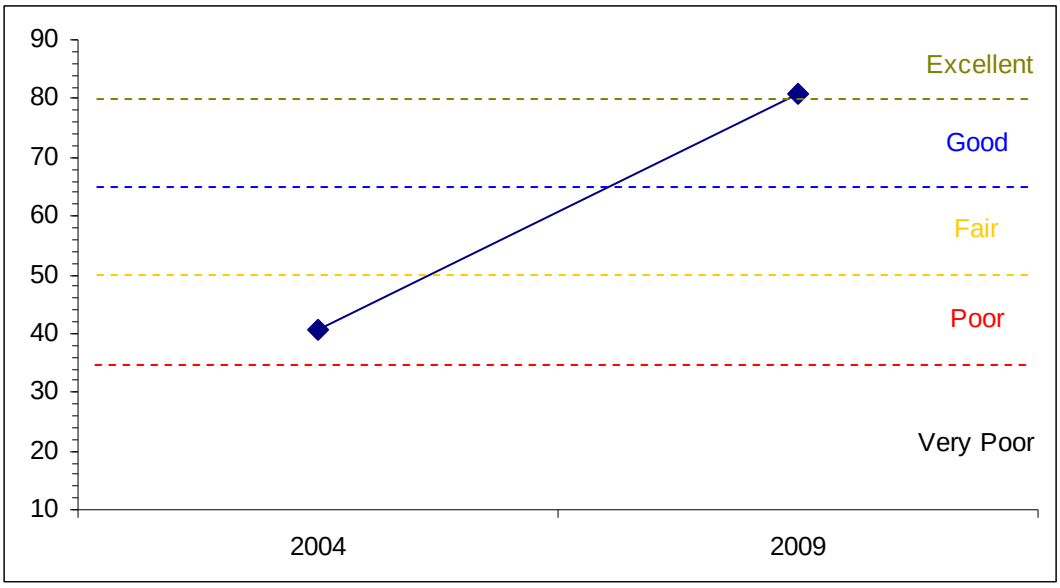
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	**Total Score**	Ranking
04	28.4	5.6	1.6	7.8	-7.4	4.6	0.0	**40.6**	Poor
09	27.7	11.1	15.0	18.4	-1.1	9.6	0.0	**80.8**	Good-Excellent

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 15, Study no: 14



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL
Management unit 15, Study no: 14



HERBACEOUS TRENDS--
Management unit 15, Study no: 14

Type	Species	Nested Frequency '04	Nested Frequency '09	Average Cover % '04	Average Cover % '09
G	Agropyron trachycaulum	[a]48	[b]95	1.36	6.28
G	Bouteloua gracilis	-	5	-	.15
G	Bromus tectorum (a)	[b]271	[a]108	9.84	1.40
G	Oryzopsis hymenoides	1	9	.00	.09
G	Poa fendleriana	45	41	1.32	1.02
G	Poa pratensis	2	-	.03	-
G	Poa secunda	[a]3	[b]8	.03	.18
G	Sitanion hystrix	[b]53	[a]29	.85	.54
G	Stipa lettermani	19	10	.30	.93
Total for Annual Grasses		271	108	9.84	1.40
Total for Perennial Grasses		171	197	3.90	9.22
Total for Grasses		442	305	13.75	10.63
F	Agoseris glauca	[a]12	[b]30	.04	.60
F	Antennaria rosea	[a]4	[b]12	.18	.33
F	Arabis sp.	1	2	.00	.00
F	Aster sp.	6	5	.03	.16
F	Calochortus nuttallii	[a]10	[b]41	.03	.14
F	Castilleja linariaefolia	7	13	.07	.13
F	Cirsium sp.	1	1	.03	.15
F	Crepis acuminata	[b]48	[a]21	.58	.32
F	Cymopterus sp.	12	11	.04	.20
F	Erigeron eatonii	38	50	.68	.98
F	Gayophytum ramosissimum(a)	8	-	.06	-
F	Ipomopsis aggregata	4	7	.04	.07

Type	Species	Nested Frequency		Average Cover %	
		'04	'09	'04	'09
F	Lappula occidentalis (a)	$_{b}$39	$_{a}$3	.22	.00
F	Lomatium sp.	5	7	.03	.04
F	Machaeranthera canescens	$_{a}$4	$_{b}$21	.01	.11
F	Penstemon sp.	-	3	-	.01
F	Phlox longifolia	21	12	.13	.03
F	Polygonum douglasii (a)	$_{b}$66	$_{a}$30	.20	.05
F	Sanguisorba minor	-	1	-	.00
F	Senecio multilobatus	1	1	.00	.01
F	Taraxacum officinale	$_{a}$8	$_{b}$35	.31	1.19
F	Tragopogon dubius	$_{a}$5	$_{b}$18	.06	.30
Total for Annual Forbs		113	33	0.49	0.05
Total for Perennial Forbs		187	291	2.32	4.80
Total for Forbs		300	324	2.81	4.86

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

BROWSE TRENDS--
Management unit 15, Study no: 14

Type	Species	Strip Frequency		Average Cover %	
		'04	'09	'04	'09
B	Amelanchier utahensis	3	4	.03	.03
B	Artemisia nova	37	40	7.15	6.00
B	Artemisia tridentata vaseyana	56	64	14.93	15.54
B	Cercocarpus montanus	0	0	-	-
B	Chrysothamnus depressus	1	1	-	-
B	Chrysothamnus nauseosus graveolens	8	8	1.01	1.91
B	Ephedra viridis	0	0	-	-
B	Gutierrezia sarothrae	25	30	1.14	.67
B	Juniperus osteosperma	1	1	.85	3.44
B	Juniperus scopulorum	0	1	3.77	1.82
B	Opuntia sp.	1	1	-	.03
B	Pinus edulis	1	1	1.00	.66
B	Pinus flexilis	1	1	.85	.85
B	Quercus gambelii	4	4	.76	.76
B	Ribes sp.	0	0	-	-
B	Symphoricarpos oreophilus	0	0	-	-
Total for Browse		138	156	31.52	31.76

CANOPY COVER, LINE INTERCEPT--
Management unit 15, Study no: 14

Species	Percent Cover	
	'04	'09
Amelanchier utahensis	.36	.60
Artemisia nova	5.98	6.81
Artemisia tridentata vaseyana	15.30	14.94
Chrysothamnus nauseosus graveolens	1.11	1.31
Ephedra viridis	-	.06
Gutierrezia sarothrae	.51	.68
Juniperus osteosperma	1.08	4.40
Juniperus scopulorum	4.59	1.81
Pinus edulis	1.60	2.08
Pinus flexilis	1.26	1.50
Quercus gambelii	.90	.50

KEY BROWSE ANNUAL LEADER GROWTH--
Management unit 15, Study no: 14

Species	Average leader growth (in)	
	'04	'09
Amelanchier utahensis	-	2.0
Artemisia tridentata vaseyana	1.4	2.0

BASIC COVER--
Management unit 15, Study no: 14

Cover Type	Average Cover %	
	'04	'09
Vegetation	48.49	46.56
Rock	11.46	13.25
Pavement	3.27	2.23
Litter	46.51	42.74
Cryptogams	.03	.55
Bare Ground	12.10	14.48

SOIL ANALYSIS DATA --
Management unit 15, Study no: 14, Study Name: Dugout Creek

Effective rooting depth (in)	pH	clay loam			%0M	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
10.5	7.2	28.3	32.2	39.5	2.1	14	361.6	0.5

PELLET GROUP DATA--
Management unit 15, Study no: 14

Type	Quadrat Frequency '04	Quadrat Frequency '09	Days use per acre (ha) '04	Days use per acre (ha) '09
Rabbit	11	17	-	-
Deer	8	34	42 (103)	104 (258)
Bison/Cattle	7	2	12 (29)	2 (5)
Elk	-	-	-	1 (2)

BROWSE CHARACTERISTICS--
Management unit 15, Study no: 14

		Age class distribution				Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Amelanchier utahensis									
04	**60**	0	100	-	-	67	0	0	29/35
09	**200**	60	40	-	40	20	0	0	41/42
Artemisia nova									
04	**2880**	8	56	36	460	8	0	9	12/24
09	**3540**	30	47	23	180	8	.56	6	10/23
Artemisia tridentata vaseyana									
04	**3340**	0	69	31	10080	44	0	13	26/35
09	**13260**	63	27	10	2620	3	0	7	18/27
Cercocarpus montanus									
04	**0**	0	0	-	-	0	0	0	36/45
09	**0**	0	0	-	-	0	0	0	58/53
Chrysothamnus depressus									
04	**20**	0	100	-	-	0	0	0	6/10
09	**20**	0	100	-	-	100	0	0	4/9
Chrysothamnus nauseosus graveolens									
04	**260**	0	54	46	20	0	0	15	34/39
09	**220**	0	73	27	20	9	0	27	27/33
Ephedra viridis									
04	**0**	0	0	-	-	0	0	0	-/-
09	**0**	0	0	-	-	0	0	0	17/12
Gutierrezia sarothrae									
04	**1180**	15	83	2	60	8	0	0	7/9
09	**2260**	25	73	2	80	0	0	2	5/8
Juniperus osteosperma									
04	**20**	0	100	-	-	0	0	0	-/-
09	**20**	0	100	-	-	0	0	0	-/-
Juniperus scopulorum									
04	**0**	0	0	-	-	0	0	0	-/-
09	**20**	0	100	-	60	0	0	0	-/-

		Age class distribution				Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Opuntia sp.									
04	**20**	100	0	-	-	0	0	0	4/18
09	**40**	0	100	-	-	0	0	0	5/12
Pinus edulis									
04	**20**	100	0	-	60	0	0	0	-/-
09	**20**	0	100	-	40	0	0	0	-/-
Pinus flexilis									
04	**20**	0	100	-	-	0	0	0	-/-
09	**20**	0	100	-	-	0	0	0	-/-
Quercus gambelii									
04	**420**	19	81	-	-	0	0	0	45/22
09	**740**	19	81	-	-	59	30	0	50/29
Ribes sp.									
04	**0**	0	0	-	-	0	0	0	61/56
09	**0**	0	0	-	-	0	0	0	58/96
Symphoricarpos oreophilus									
04	**0**	0	0	-	-	0	0	0	20/44
09	**0**	0	0	-	-	0	0	0	19/40