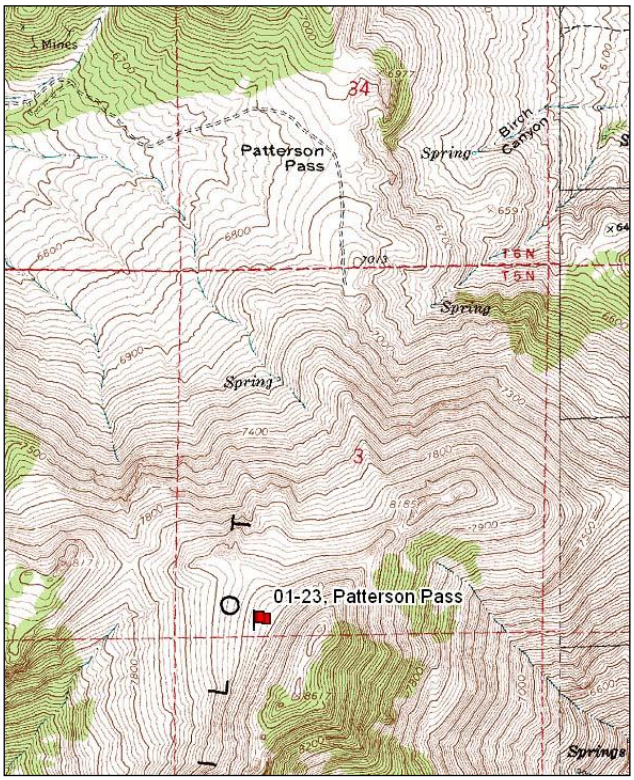
PATTERSON PASS - TREND STUDY NO. 1-23-11

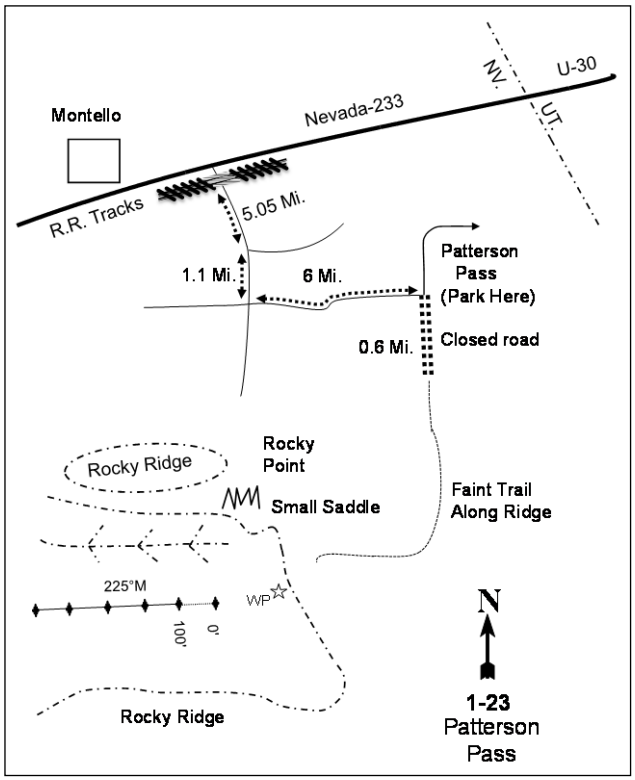
Vegetation Type: Mountain Big Sagebrush
Range Type: Crucial Deer Summer (Fawning habitat), Crucial Elk Summer
NRCS Ecological Site Description: Not Available
Land Ownership: BLM
Elevation: 8,200 ft. (2,499 m)
Aspect: Southwest
Slope: 15-25%
Transect bearing: 225° magnetic
Belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95 ft). Rebar: belt 1on 1ft., belt 2 on 15 ft., belt 3 on 0 ft., belt 4 on 1ft., belt 5 on 0 ft.

Directions:
Drive 0.5 miles past mile marker 25 on Nevada State Road 233. Turn left to cross the railroad tracks and continue straight for 5.05 miles. At this point there will be a road going to the left. Stay right and continue 1.1 miles to a four way intersection. Take a left turn and drive 6 miles to Patterson Pass. Park here at Patterson Pass. Walk up a closed road for 0.6 miles to a faint trail. From here, walk on the trail up the ridge to a saddle. Stay high on the slope. The witness post is in the saddle about 400 ft. from the rocky slope to the east. The 0-foot baseline stake is just a few paces west of the witness post. The baseline runs 225 degrees magnetic.

Map Name: Patterson Pass



Diagrammatic Sketch:



Township: 5N Range: 19W Section: 3

GPS: NAD 83, UTM 12S 246926 E 4562319 N

PATTERSON PASS - TREND STUDY NO. 1-23

Site Information

Site Description: The study was established in 1996 to monitor important habitat for elk on the Pilot Mountains along the Utah-Nevada border. The study area is above Patterson Pass in a remote area accessible only by foot. The area is managed by the Bureau of Land Management as part of the Lucin-Pilot allotment. This area receives concentrated occupancy by elk. Elk pellet groups have been sampled in moderately high abundance since 2001. Two cow elk were seen in the area when the site was read in early summers of 2001 and 2006. It appears that elk occupy the area throughout the spring and summer. Bedding areas were also noted, and it appeared that some sagebrush plants were used as antler rubs. Small numbers of deer pellet groups have also been sampled. Livestock do not appear to utilize the steeper slopes where the study is located (Table - Pellet Group Data). Chuckers were heard on the nearby rocky slopes in 1996.

Browse: The site is dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). It has accounted for more than half of the browse cover since the study was established. Black sagebrush is also abundant, and has increased in cover since 1996 (Table - Browse Trends). It appears that there is some hybridization occurring between these two species, which may cause some confusion in identification. The two species combined have a dense population. Utilization of sagebrush has been light to moderate over the course of the study. Decadence and poor vigor of mountain big sagebrush have been moderate. Decadence and poor vigor of black sagebrush have been low. Recruitment of young plants for both sagebrush species was good at the outset of the study, but has decreased and was considered to be poor in 2011. Additional forage is provided by a small population of slenderbush eriogonum (*Eriogonum microthecum*) and a few scattered wax current (*Ribes cereum* ssp. *cereum*). The increaser species mountain low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *lanceolatus*) is fairly abundant, but density has steadily decreased since 1996 (Table - Browse Characteristics).

Herbaceous Understory: The herbaceous understory is abundant and diverse. Sheep fescue (*Festuca ovina*) is the most abundant grass species, providing over 60% of the grass cover since 1996. Spike fescue (*Leucopoa kingii*), mutton bluegrass (*Poa fendleriana*), and Sandberg bluegrass (*P. secunda*) are also common. Several useful forb species are abundant including silvery lupine (*Lupinus argenteus*), bluebell (*Mertensia oblongifolia*), lambstongue groundsel (*Senecio integerrimus*), and Hooker balsamroot (*Balsamorhiza hookeri*) (Table - Herbaceous Trends).

Soil: The soil is in the Lundy-Sonlet-Lodar very gravelly loams, likely as part of the Lundy component. These soils occur on hillslopes, with parent material consisting of colluvium derived from chert and/or limestone (Soil Survey Staff 2011). Rooting depth is limited in some areas where black sagebrush occurs in isolated pockets, but the deeper rooted mountain big sagebrush, which dominates the site, would indicate a deeper soil. The soil texture is loam with a neutral soil reaction (pH 6.7) (Table - Soil Analysis Data). It is extremely rocky with numerous large rocks and boulders on the surface and throughout the profile. Protective ground cover, in the form of vegetation and litter cover, is abundant and well dispersed (Table - Basic Cover). The soil erosion condition has been classified as stable since 2001.

Trend Assessments

Browse:

- **1996 to 2001 - stable (0):** Combined density of mountain big sagebrush and black sagebrush increased by 10% from 7,160 plants/acre to 7,900 plants/acre, but cover remained similar at 25%. Recruitment of young black sagebrush plants decreased from 12% to 3%, and recruitment of young mountain big sagebrush decreased from 17% to 10%. Mountain low rabbitbrush decreased 20% from 4,100 plants/acre to 3,280 plants/acre, and cover decreased from 5% to 4%.

- **2001 to 2006 - stable (0):** Combined mountain big sagebrush and black sagebrush density remained similar at 7,820 plants/acre, but cover increased to 29%. Decadence of mountain big sagebrush increased from 15% to 27%, and poor vigor increased from 9% to 13%. Recruitment of mountain big sagebrush decreased to 2%, but black sagebrush recruitment increased to 9%.
- **2006 to 2011 - stable (0):** The combined density of mountain big sagebrush and black sagebrush decreased 7% to 7,300 plants/acre, and cover decreased to 25%. Decadence and poor vigor of mountain big sagebrush remained similar at 23% and 19%, respectively. Recruitment remained poor for both species.

Grass:

- **1996 to 2001 - slightly down (-1):** The perennial grass sum of nested frequency decreased by 12%, but cover increased from 18% to 26%.
- **2001 to 2006 - stable (0):** There was little change in the sum of nested frequency of perennial grasses, but cover decreased to 20%.
- **2006 to 2011 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 19%, and cover decreased to 14%.

Forb:

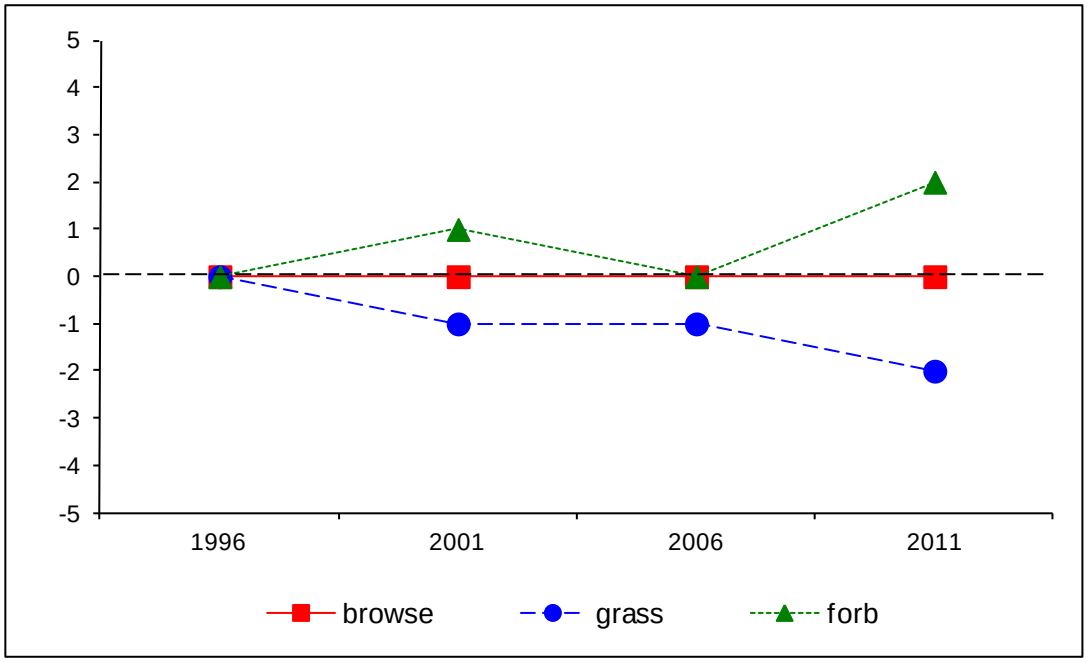
- **1996 to 2001 - slightly up (+1):** The sum of nested frequency of perennial forbs increased by 18%, and cover increased from 10% to 14%.
- **2001 to 2006 - slightly down (-1):** The sum of nested frequency of perennial forbs decreased by 13%, but cover increased to 20%.
- **2006 to 2011 - up (+2):** There was a 20% increase in the sum of nested frequency of perennial forbs, though cover decreased to 15%. Sum of nested frequency and cover of annual forbs also increased markedly.

DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --
Management unit 1, study no: 23

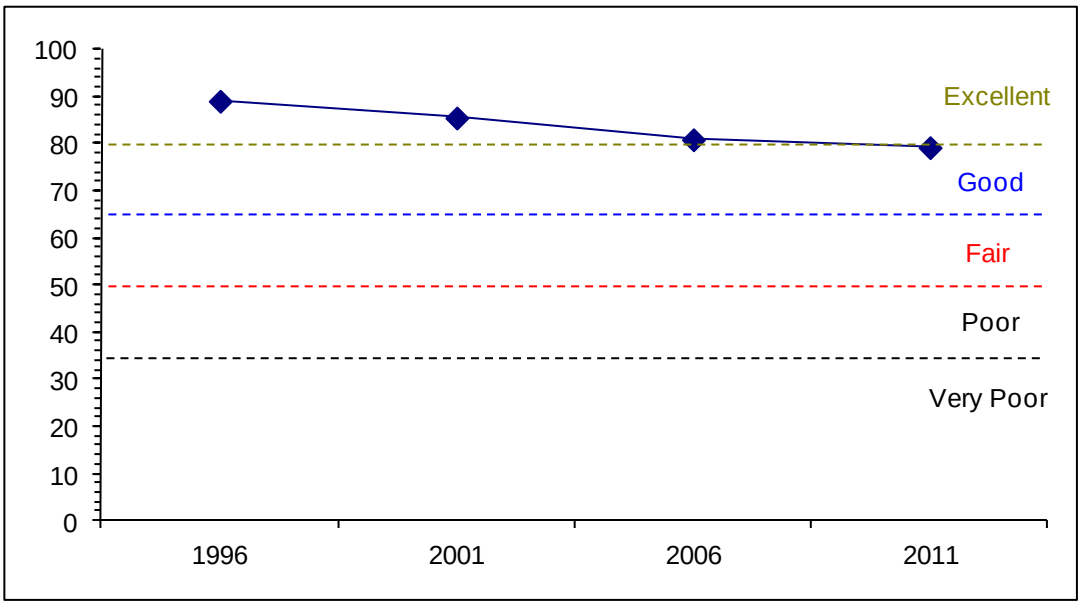
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	**Total Score**	Ranking
96	30.0	11.2	7.8	30.0	0.0	10.0	0.0	**89.0**	Excellent
01	30.0	11.2	4.2	30.0	0.0	10.0	0.0	**85.4**	Excellent
06	30.0	8.9	1.9	30.0	0.0	10.0	0.0	**80.8**	Good-Excellent
11	30.0	9.8	2.0	27.3	0.0	10.0	0.0	**79.2**	Good-Excellent

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 1 Study no: 23



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL--
Management unit 1, Study no: 23



HERBACEOUS TRENDS--
Management unit 01, Study no: 23

Type	Species	Nested Frequency				Average Cover %			
		'96	'01	'06	'11	'96	'01	'06	'11
G	Agropyron spicatum	b43	b24	a6	a10	.32	.78	.18	.10
G	Elymus cinereus	a5	a5	a5	b32	.63	.85	.63	.47
G	Festuca ovina	a292	a287	a281	b246	12.97	15.92	12.14	9.93
G	Koeleria cristata	-	2	-	-	-	.30	-	-
G	Leucopoa kingii	b110	ab84	b98	a53	2.50	4.80	3.96	2.11
G	Melica bulbosa	-	-	1	-	-	-	.15	-
G	Poa fendleriana	b47	b63	b49	a14	.77	1.99	1.08	.12
G	Poa pratensis	1	-	-	-	.03	-	-	-
G	Poa secunda	b95	a35	b67	ab62	1.07	.29	1.22	.88
G	Sitanion hystrix	3	-	-	-	.00	-	-	-
G	Stipa columbiana	-	5	-	-	-	.03	-	-
G	Stipa lettermani	ab11	b28	ab14	a7	.08	.63	.39	.04
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		607	533	521	424	18.40	25.61	19.77	13.66
Total for Grasses		607	533	521	424	18.40	25.61	19.77	13.66
F	Agoseris glauca	ab83	ab106	a69	b107	.60	.93	1.27	1.33
F	Arabis sp.	-	7	3	-	-	.01	.00	-
F	Astragalus beckwithii	-	2	-	-	-	.01	-	-
F	Astragalus utahensis	1	-	-	-	.00	-	-	-
F	Balsamorhiza hookeri	5	5	12	4	.01	.06	.89	.01
F	Castilleja linariaefolia	-	-	-	-	-	.00	-	-
F	Chenopodium fremontii (a)	-	-	-	5	-	-	-	.15
F	Collinsia parviflora (a)	b198	a106	a95	b247	.86	.75	.27	2.14
F	Comandra pallida	7	13	17	11	.07	.18	.54	.04
F	Crepis acuminata	7	4	-	9	.02	.06	-	.21
F	Hackelia patens	33	11	19	4	.44	.39	.75	.06
F	Haplopappus acaulis	a2	a2	a-	b20	.15	.03	-	.10
F	Lithophragma parviflora	a-	a-	c27	b11	-	-	.22	.02
F	Lomatium sp.	-	4	-	5	-	.03	-	.06
F	Lupinus argenteus	b150	ab153	ab126	a99	4.57	5.04	5.90	.88
F	Lygodesmia spinosa	2	-	-	-	.03	-	-	-
F	Mertensia oblongifolia	a71	a70	a88	b151	.77	.72	1.38	2.16
F	Microsteris gracilis (a)	-	1	-	-	-	.00	-	-
F	Penstemon sp.	3	-	-	-	.00	-	-	-
F	Phlox hoodii	-	-	3	2	-	-	.00	.01
F	Phlox longifolia	b188	b155	a66	a78	.81	1.10	.33	.50
F	Polygonum douglasii (a)	6	2	6	3	.04	.00	.01	.01
F	Potentilla pennsylvanica	ab50	b57	ab48	a32	.61	.90	1.85	.14
F	Ranunculus jovis	a-	b134	b107	c197	-	1.41	.82	4.11
F	Senecio integerrimus	a77	a60	b132	a87	1.22	2.09	6.34	3.59
F	Senecio multilobatus	a-	b17	a-	b28	-	.76	-	.93
F	Sisymbrium altissimum (a)	4	-	-	-	.03	-	-	-
F	Taraxacum officinale	31	34	11	28	.35	.28	.11	.40

Type	Species	Nested Frequency				Average Cover %			
		'96	'01	'06	'11	'96	'01	'06	'11
Total for Annual Forbs		208	109	101	255	0.93	0.76	0.29	2.30
Total for Perennial Forbs		710	834	728	873	9.69	14.07	20.45	14.59
Total for Forbs		918	943	829	1128	10.63	14.84	20.74	16.90

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

BROWSE TRENDS--
Management unit 01, Study no: 23

Type	Species	Strip Frequency				Average Cover %			
		'96	'01	'06	'11	'96	'01	'06	'11
B	Artemisia nova	34	27	33	46	6.58	3.99	8.43	10.92
B	Artemisia tridentata vaseyana	85	87	78	74	17.79	21.00	20.52	14.08
B	Chrysothamnus viscidiflorus lanceolatus	74	64	67	46	4.60	4.03	3.13	1.17
B	Eriogonum microthecum	38	29	36	16	1.36	.90	1.89	.38
B	Pediocactus simpsonii	3	1	1	1	-	-	.15	-
B	Ribes cereum cereum	0	0	1	1	-	.38	.38	.03
Total for Browse		234	208	216	184	30.35	30.31	34.51	26.59

CANOPY COVER, LINE INTERCEPT--
Management unit 01, Study no: 23

Species	Percent Cover	
	'06	'11
Artemisia nova	13.10	14.16
Artemisia tridentata vaseyana	26.56	18.08
Chrysothamnus viscidiflorus lanceolatus	4.21	1.16
Eriogonum microthecum	1.48	.68
Ribes cereum cereum	.08	-

KEY BROWSE ANNUAL LEADER GROWTH--
Management unit 01, Study no: 23

Species	Average leader growth (in)		
	'01	'06	'11
Artemisia nova	-	1.1	0.6
Artemisia tridentata vaseyana	1.3	1.9	1.2

BASIC COVER--
Management unit 01, Study no: 23

Cover Type	Average Cover %			
	'96	'01	'06	'11
Vegetation	55.85	64.50	65.55	53.47
Rock	12.85	9.43	11.84	11.08
Pavement	.60	.32	2.00	1.00
Litter	61.70	52.75	34.43	32.95
Cryptogams	.00	.04	.01	.74
Bare Ground	3.30	2.31	4.65	8.93

SOIL ANALYSIS DATA --
Management unit 01, Study no: 23, Study Name: Patterson Pass

Effective rooting depth (in)	pH	Loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
9.8	6.7	40.6	33.4	26.0	5.4	36.2	444.8	0.5

PELLET GROUP DATA--
Management unit 01, Study no: 23

Type	Quadrat Frequency			
	'96	'01	'06	'11
Rabbit	-	-	14	-
Grouse	-	1	-	-
Elk	58	25	34	29
Deer	4	1	2	3
Cattle	-	-	-	1

Days use per acre (ha)		
'01	'06	'11
-	-	-
-	-	-
47 (116)	40 (99)	44 (109)
1 (2)	1 (3)	2 (5)
-	-	-

BROWSE CHARACTERISTICS--
Management unit 01, Study no: 23

		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 nova									
96	**2100**	12	79	9	180	39	.95	0	11/25
01	**1900**	3	93	4	-	0	0	1	11/20
06	**2980**	9	87	4	8540	0	0	.67	11/21
11	**3660**	3	87	10	100	18	.54	4	13/29
Artemisia tridentata vaseyana									
96	**5060**	17	68	15	340	27	11	4	19/33
01	**6000**	10	76	15	60	8	0	9	19/32
06	**4840**	2	71	27	1940	9	.41	13	20/33
11	**3640**	5	71	23	-	37	0	19	20/36
Chamaebatiaria millefolium									
96	**0**	0	0	-	-	0	0	0	-/-
01	**0**	0	0	-	-	0	0	0	-/-
06	**0**	0	0	-	-	0	0	0	44/81
11	**0**	0	0	-	-	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)
Chrysothamnus nauseosus									
96	**0**	0	0	-	-	0	0	0	-/-
01	**0**	0	0	-	-	0	0	0	-/-
06	**0**	0	0	-	-	0	0	0	24/17
11	**0**	0	0	-	-	0	0	0	-/-
Chrysothamnus viscidiflorus lanceolatus									
96	**4100**	11	78	11	20	4	0	7	11/16
01	**3280**	9	76	15	-	.60	0	5	9/16
06	**2760**	6	89	5	-	0	0	0	9/15
11	**1620**	0	80	20	-	2	0	19	10/13
Eriogonum microthecum									
96	**1320**	15	85	0	-	12	0	0	6/12
01	**1120**	0	100	0	-	0	0	0	6/13
06	**1380**	1	96	3	-	4	0	0	6/14
11	**460**	0	91	9	-	0	0	13	7/14
Pediocactus simpsonii									
96	**80**	0	100	-	-	50	0	0	7/6
01	**20**	0	100	-	-	0	0	0	3/3
06	**20**	0	100	-	-	0	0	0	4/5
11	**20**	0	100	-	-	0	0	0	5/10
Ribes cereum cereum									
96	**0**	0	0	0	-	0	0	0	3/94
01	**0**	0	0	0	-	0	0	0	37/103
06	**20**	0	0	100	-	0	0	100	34/81
11	**20**	0	0	100	-	0	0	100	37/70