

Trend Study 13A-15-04

Study site name: Hideout Mesa .

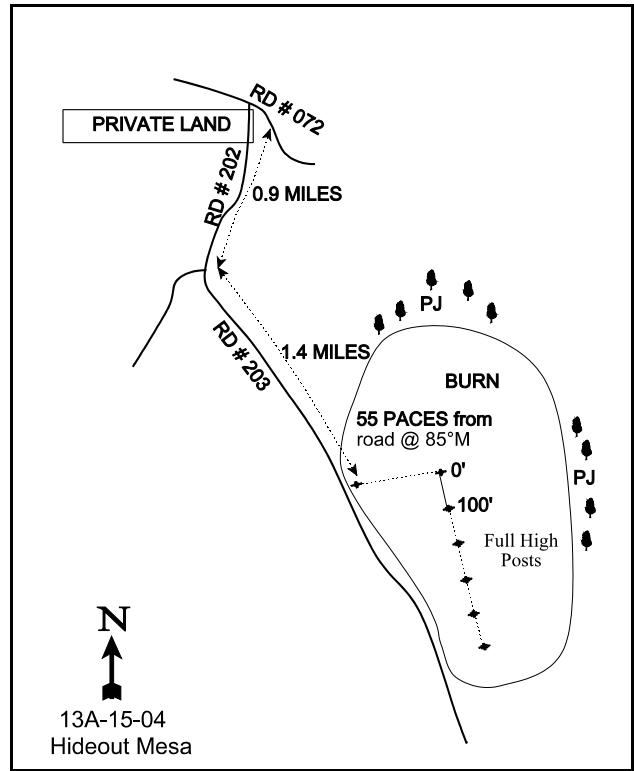
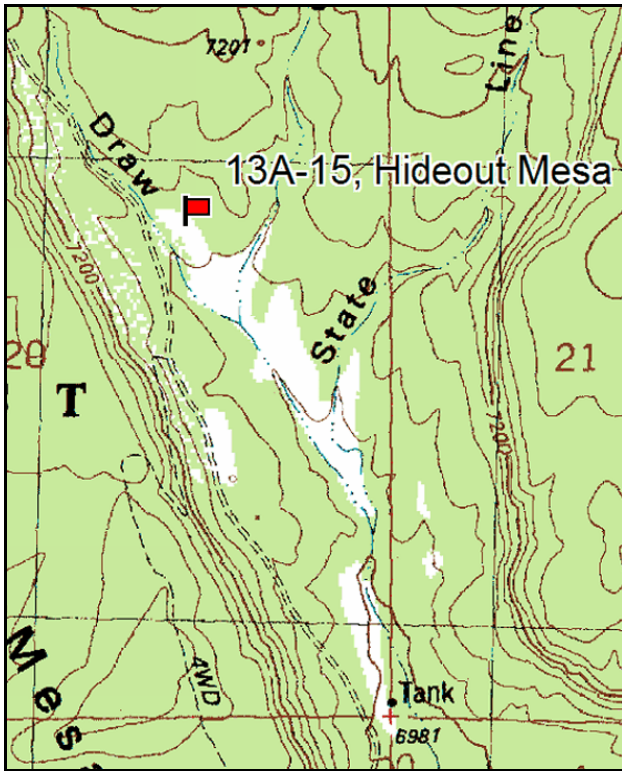
Vegetation type: Sagebrush-Grass Burn .

Compass bearing: frequency baseline 155 degrees magnetic.

Frequency belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

LOCATION DESCRIPTION

From LaSal Junction take Highway 46 east to mile marker #16. From mile marker #16 travel east 0.10 miles and turn left (north). Proceed 1.2 miles to Forest Service Road #072 and turn right (fork heads toward Buckeye Reservoir). Continue 5.2 miles to a cattle guard. Continue 1.9 miles and turn right (south) on F. S. Road #202. Continue 0.90 miles and take on F. S. Road #203. Proceed 1.4 miles to a burn on the left side of the road. The baseline can be found by walking east several hundred feet out into the burn. The 0 foot stake is marked by browse tag #25.



Map Name: Ray Mesa

Diagrammatic Sketch

Township 28S , Range 26E , Section 20

GPS: NAD 27, UTM 12S 4246851 N, 668312 E

## DISCUSSION

### Hideout Mesa - Trend Study No. 13A-15

Hideout Mesa is a site that was selected because of its recognized importance to an increasing elk population. It is located within the southeast lower benches of the LaSal Mountains, just west of the Colorado-Utah state line. It is in one of the bottom's of the many shallow canyons which are surrounded by several rugged flat-topped mesa's. This study is inside a shallow canyon bottom of sagebrush and grass, within a moderately large opening of thick pinyon-juniper woodland in association with scattered Ponderosa pine. The area burned around 1994 and in 2002 a fire came within one-third of mile to the study site. Pellet group data from 1999 estimated 11 deer (27 ddu/ha), 36 elk (89 edu/ha), and 50 cow days use/acre (124 cdu/ha). There are two well worn livestock trails that run through the site. Pellet group data from 2004 estimated 11 elk (27 edu/ha) and 22 cow days use/acre (54 cdu/ha). This area is managed by the Forest Service and is part of the South Paradox grazing allotment.

The site has an elevation of 7,100 feet with a southeast aspect and slope of about 3%. The shallow and narrow canyon bottom has a moderately shallow (effective rooting depth of only 10 inches) sandy clay loam soil with very little rock or pavement on the surface or within the profile. Soil pH is neutral (7.2) with good amounts of phosphorous, one of only a few sites with above 10 ppm of phosphorous. Past erosion problems are evident due to a large gully nearby that has been active historically. The site has a fairly good vegetative cover, with on average almost 55% of the cover coming from herbaceous species, which gives the best protection from high intensity summer storms. Percent bare ground is fairly high for this kind of site, but it has been about the same since 1994.

The most common browse species on this site in order of abundance are mountain big sagebrush, fringed sagebrush, low rabbitbrush, and broom snakeweed. There are a few scattered plants of serviceberry, fourwing saltbush, and rubber rabbitbrush. The key browse species on this site is mountain big sagebrush which appears to be increasing in numbers and on average provides 76% of the browse cover. The proportion of seedlings to the population for this site was 196% in 1994, 3% in 1999, and 46% in 2004. Percent young age class has increased from 27% in 1994 to 54% in 1999, then decreased to 9% in 2004. Percent decadence has decreased from 17% in 1994 down to 13% in 1999 and 2004. The sagebrush population appears to be doing well with a well distributed age class.

The herbaceous understory is diverse with 13 species of grasses and 37 species of forbs being identified in 2004. Western wheatgrass, blue grama, prairie junegrass, and needle-and-thread grass made up 88% of the grass cover in 1994 and 72% in 1999. By 2004, those same grasses only accounted for 23% of the grass cover. However, cheatgrass only made up 0% of the grass cover in 1994, 18% in 1999, and increased to 73% in 2004. This change in species composition has greatly increases the likelihood of another wildfire occurring in the area. Initially after the burn, annual grasses (cheatgrass and sixweeks fescue) made up less than one percent of the grass cover. The herbaceous understory has many forb species, yet only one has a consistent cover value greater than one percent. Scarlet globemallow has a cover value on average of almost 2%.

### 1994 APPARENT TREND ASSESSMENT

The soil trend, with the available data, would be stable with almost 60% of the vegetative cover coming from the herbaceous species. Litter cover is fairly good even with the recent fire. Relative percent bare ground is moderately high at 30%, but this is mitigated by the high amounts of litter and herbaceous cover. The browse trend is up with most of the key species showing characteristics of an increasing population, especially the mountain big sagebrush population. The herbaceous understory is stable to increasing. The Desirable Components Index rated this site as good with a score of 74 due to high number of young key browse species, good perennial grass cover, decreased annual grass cover, and moderate decadent shrubs.

winter range condition (DC Index) - 74 (good) Mountain big sagebrush type

1999 TREND ASSESSMENT

The soil trend appears to be stable with percent bare soil almost equal to what it was in 1994. Some litter cover was lost from 1994, but that was compensated for by increases in cryptogamic cover. On average about 60% of the vegetative cover comes from herbaceous species. The browse trend is up, especially for the key species (mountain big sagebrush) which continues to show characteristics of an increasing population. The herbaceous understory is stable to increasing even with the losses some forbs which is compensated for by the grasses. The Desirable Components Index rated this site as good with a score of 72 due to moderate number of young key browse species, increase in annual grass cover, and moderate decadent shrubs.

TREND ASSESSMENT

soil - stable (3)

browse - up (5)

herbaceous understory - stable (3)

winter range condition (DC Index) - 72 (good) Mountain big sagebrush type

2004 TREND ASSESSMENT

The trend for soil continues to be stable. Percent bare ground is similar to 1994 and 1999 estimates. Protective cover has not changed much from 1999, although cryptogamic cover decreased back to 1994 levels of 2% total cover. Trend for key browse mountain big sagebrush is up. The number of mature sagebrush plants increased from 2,180 plants/acre in 1999 to 3,620 in 2004. Utilization was light, vigor is good, and annual leader growth averaged almost 2 inches. Sagebrush seedlings were abundant this year, although the number of young plants was lower than previous years. Trend for the herbaceous understory is down. Several of the perennial grasses decreased significantly in nested frequency, specifically Western wheatgrass, prairie junegrass, and mutton bluegrass. Cheatgrass increased significantly from 9% of the total cover in 1999 to 31% in 2004. Quadrat frequency also increased significantly for cheatgrass from 38% to 71%. Forbs are diverse with 37 species being sampled, but they contribute little to overall cover. This site is now highly susceptible to fire because of the large increase in fine fuels contributed by cheatgrass. The Desirable Components Index rated this site as poor with a score of 46 due to large increase in cheatgrass, decrease in perennial grasses, and few young key browse species.

TREND ASSESSMENT

soil - stable (3)

browse - up (5)

herbaceous understory - down (1)

winter range condition (DC Index) - 46 (poor) Mountain big sagebrush type

HERBACEOUS TRENDS --

Management unit 13A, Study no: 15

Type	Species	Nested Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
G	Agropyron intermedium	a-	a-	b20	-	-	.10
G	Agropyron smithii	b276	b252	a75	4.98	3.68	.52
G	Bouteloua gracilis	58	50	52	1.16	.72	.85

Type	Species	Nested Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
		G	<i>Bromus tectorum</i> (a)	<sub>a</sub> 26	<sub>b</sub> 127	<sub>c</sub> 269	.04
G	<i>Carex</i> spp.	1	5	10	.00	.02	.05
G	<i>Hilaria jamesii</i>	6	4	5	.19	.03	.01
G	<i>Koeleria cristata</i>	<sub>b</sub> 216	<sub>b</sub> 169	<sub>a</sub> 35	3.82	4.17	.35
G	<i>Oryzopsis hymenoides</i>	3	9	11	.18	.09	.01
G	<i>Poa fendleriana</i>	<sub>b</sub> 29	<sub>b</sub> 45	<sub>a</sub> 3	.12	.46	.00
G	<i>Poa pratensis</i>	5	-	-	.01	-	-
G	<i>Poa secunda</i>	<sub>a</sub> -	<sub>c</sub> 56	<sub>b</sub> 19	-	.59	.31
G	<i>Sitanion hystrix</i>	<sub>b</sub> 54	<sub>ab</sub> 25	<sub>a</sub> 16	.95	.19	.25
G	<i>Sporobolus cryptandrus</i>	-	9	1	-	.04	.00
G	<i>Stipa comata</i>	<sub>a</sub> 51	<sub>ab</sub> 86	<sub>b</sub> 102	1.24	2.47	2.12
G	<i>Vulpia octoflora</i> (a)	3	4	3	.00	.03	.01
Total for Annual Grasses		29	131	272	0.04	2.85	12.31
Total for Perennial Grasses		699	710	349	12.69	12.50	4.61
Total for Grasses		728	841	621	12.74	15.35	16.92
F	<i>Agoseris glauca</i>	-	2	1	-	.00	.01
F	<i>Alyssum alyssoides</i> (a)	4	-	1	.01	-	.00
F	<i>Androsace septentrionalis</i> (a)	<sub>a</sub> -	<sub>b</sub> 45	<sub>a</sub> 2	-	.10	.00
F	<i>Artemisia ludoviciana</i>	29	23	13	.53	.57	.39
F	<i>Astragalus miser</i>	9	3	-	.39	.03	-
F	<i>Castilleja linariaefolia</i>	6	-	-	.06	-	-
F	<i>Calochortus nuttallii</i>	-	-	3	-	-	.01
F	<i>Chenopodium fremontii</i> (a)	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 21	-	-	.04
F	<i>Chenopodium leptophyllum</i> (a)	-	-	3	-	-	.01
F	<i>Cirsium undulatum</i>	4	1	1	.03	.00	.03
F	<i>Comandra pallida</i>	<sub>b</sub> 94	<sub>a</sub> -	<sub>a</sub> -	.69	-	-
F	<i>Collinsia parviflora</i> (a)	<sub>b</sub> 39	<sub>a</sub> 1	<sub>a</sub> 2	.07	.00	.00
F	<i>Crepis acuminata</i>	-	1	5	-	.03	.09
F	<i>Cryptantha</i> spp.	6	-	13	.02	-	.07
F	<i>Cymopterus</i> spp.	4	-	-	.00	-	.00
F	<i>Descurainia pinnata</i> (a)	3	-	1	.01	-	.00
F	<i>Draba nemorosa</i> (a)	<sub>b</sub> 75	<sub>a</sub> 11	<sub>a</sub> 7	.16	.03	.01
F	<i>Erigeron divergens</i>	-	-	8	-	-	.06
F	<i>Erigeron flagellaris</i>	-	-	1	-	-	.03
F	<i>Erigeron</i> spp.	8	-	-	.02	-	-
F	<i>Erigeron pumilus</i>	<sub>b</sub> 42	<sub>a</sub> 14	<sub>a</sub> 17	.09	.08	.11

T y p e	Species	Nested Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
		F	Eriogonum racemosum	11	6	2	.17
F	Gayophytum ramosissimum(a)	4	-	5	.00	-	.01
F	Gilia spp. (a)	<sub>b</sub> 148	<sub>a</sub> 1	<sub>a</sub> 5	.32	.00	.01
F	Grindelia squarrosa	<sub>b</sub> 41	<sub>a</sub> -	<sub>a</sub> -	.15	-	-
F	Heterotheca villosa	12	11	5	.08	.36	.38
F	Ipomopsis aggregata	10	-	-	.02	-	-
F	Lappula occidentalis (a)	<sub>a</sub> 13	<sub>a</sub> 12	<sub>b</sub> 61	.04	.03	.32
F	Linum lewisii	4	7	4	.01	.06	.03
F	Lupinus spp.	4	1	5	.01	.03	.01
F	Machaeranthera canescens	<sub>b</sub> 27	<sub>a</sub> 6	<sub>a</sub> 2	.06	.01	.00
F	Microsteris gracilis (a)	<sub>a</sub> 38	<sub>b</sub> 114	<sub>a</sub> 10	.09	.36	.01
F	Oenothera pallida	5	7	1	.03	.03	.00
F	Orthocarpus spp. (a)	-	4	-	-	.00	-
F	Penstemon caespitosus	<sub>b</sub> 14	<sub>a</sub> -	<sub>b</sub> 18	.70	-	.60
F	Penstemon comarrhenus	2	5	7	.00	.01	.28
F	Penstemon spp.	<sub>b</sub> 20	<sub>b</sub> 29	<sub>a</sub> -	.07	1.27	-
F	Phlox longifolia	<sub>b</sub> 36	<sub>a</sub> 19	<sub>a</sub> 10	.08	.03	.02
F	Plantago patagonica (a)	<sub>b</sub> 77	<sub>ab</sub> 50	<sub>a</sub> 29	.32	.10	.16
F	Polygonum douglasii (a)	<sub>ab</sub> 28	<sub>b</sub> 38	<sub>a</sub> 3	.05	.09	.01
F	Ranunculus testiculatus (a)	2	-	3	.01	-	.00
F	Sphaeralcea coccinea	129	132	125	1.72	1.23	1.68
F	Tragopogon dubius	-	-	3	-	-	.04
F	Trifolium spp.	11	2	4	.02	.00	.01
F	Zigadenus paniculatus	6	8	12	.01	.02	.02
Total for Annual Forbs		431	276	153	1.09	0.74	0.63
Total for Perennial Forbs		534	277	260	5.02	3.86	3.93
Total for Forbs		965	553	413	6.12	4.60	4.56

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

BROWSE TRENDS --

Management unit 13A, Study no: 15

T y p e	Species	Strip Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
B	Amelanchier utahensis	1	1	1	-	.03	.15
B	Artemisia frigida	54	49	49	2.47	.89	1.78
B	Artemisia tridentata vaseyana	62	70	70	9.93	10.20	13.13
B	Atriplex canescens	4	7	5	.15	.02	.18
B	Chrysothamnus depressus	0	1	3	-	.03	.00
B	Chrysothamnus nauseosus	2	1	2	-	-	.15
B	Chrysothamnus viscidiflorus viscidiflorus	24	27	33	.69	.96	1.93
B	Coryphantha vivipara arizonica	0	3	2	-	-	-
B	Eriogonum microthecum	3	5	5	.00	-	.04
B	Gutierrezia sarothrae	14	15	14	.59	.25	.37
B	Opuntia spp.	7	7	5	.00	.15	-
B	Pinus edulis	0	1	1	-	-	.00
Total for Browse		171	187	190	13.87	12.53	17.76

CANOPY COVER, LINE INTERCEPT --

Management unit 13A, Study no: 15

Species	Percent Cover  '04
Amelanchier utahensis	.21
Artemisia frigida	2.34
Artemisia tridentata vaseyana	15.91
Atriplex canescens	.48
Chrysothamnus depressus	.03
Chrysothamnus nauseosus	.13
Chrysothamnus viscidiflorus viscidiflorus	2.23
Eriogonum microthecum	.05
Gutierrezia sarothrae	.56
Opuntia spp.	.11
Pinus edulis	.46

KEY BROWSE ANNUAL LEADER GROWTH --  
Management unit 13A, Study no: 15

Species	Average leader growth (in)
	'04
Artemisia tridentata vaseyana	1.7

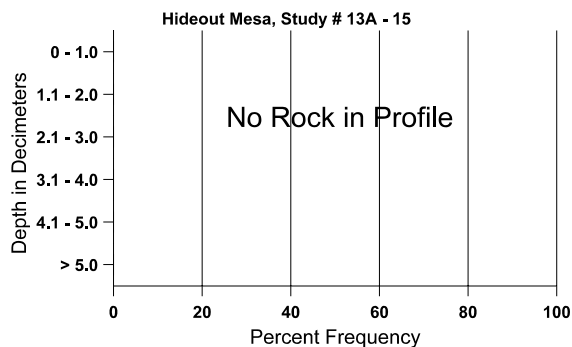
BASIC COVER --  
Management unit 13A, Study no: 15

Cover Type	Average Cover %		
	'94	'99	'04
Vegetation	29.71	35.97	37.65
Rock	.06	.89	.03
Pavement	.04	.13	.06
Litter	43.97	32.96	43.00
Cryptogams	1.32	9.93	1.82
Bare Ground	32.34	32.75	33.37

SOIL ANALYSIS DATA --  
Management unit 13A, Study no: 15, Study Name: Hideout Mesa

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
10.0	63.7 (13.3)	7.2	50.9	28.6	20.6	2.2	18.6	227.2	0.5

### Stoniness Index



PELLET GROUP DATA --  
Management unit 13A, Study no: 15

Type	Quadrat Frequency		
	'94	'99	'04
Rabbit	42	11	2
Elk	17	20	1
Deer	6	17	2
Cattle	-	5	4

Days use per acre (ha)	
'99	'04
-	-
36 (89)	11 (27)
11 (27)	-
50 (124)	22 (54)

BROWSE CHARACTERISTICS --  
Management unit 13A, Study no: 15

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<b>Amelanchier utahensis</b>												
94	<b>20</b>	-	-	20	-	-	0	0	-	-	0	20/24
99	<b>20</b>	-	-	20	-	-	0	100	-	-	0	30/28
04	<b>20</b>	-	-	20	-	-	0	100	-	-	0	28/26
<b>Artemisia frigida</b>												
94	<b>3660</b>	40	480	3080	100	60	0	0	3	-	0	8/11
99	<b>5040</b>	160	1220	3740	80	40	8	.79	2	1	1	6/6
04	<b>3080</b>	380	120	2940	20	20	5	15	1	-	1	12/10
<b>Artemisia tridentata vaseyana</b>												
94	<b>4600</b>	9000	1260	2540	800	2760	4	0	17	5	19	20/24
99	<b>6500</b>	200	3500	2180	820	2320	16	2	13	1	2	24/31
04	<b>4700</b>	2160	440	3620	640	500	18	.42	14	4	4	19/26
<b>Atriplex canescens</b>												
94	<b>80</b>	-	-	80	-	-	0	0	-	-	0	21/16
99	<b>140</b>	60	40	100	-	-	29	29	-	-	0	22/20
04	<b>100</b>	-	-	100	-	-	60	40	-	-	0	27/24
<b>Chrysothamnus depressus</b>												
94	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
99	<b>60</b>	-	-	60	-	-	0	0	-	-	0	4/12
04	<b>200</b>	-	-	200	-	-	0	0	-	-	0	4/7
<b>Chrysothamnus nauseosus</b>												
94	<b>40</b>	-	-	40	-	-	0	0	-	-	0	29/32
99	<b>20</b>	-	-	20	-	-	0	0	-	-	0	27/32
04	<b>60</b>	-	-	60	-	-	0	0	-	-	0	22/25
<b>Chrysothamnus viscidiflorus viscidiflorus</b>												
94	<b>1180</b>	180	140	1040	-	40	0	0	-	-	3	7/15
99	<b>1600</b>	-	220	1380	-	20	4	0	-	-	0	6/10
04	<b>1540</b>	-	20	1520	-	-	1	0	-	-	0	8/11
<b>Coryphantha vivipara arizonica</b>												
94	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
99	<b>60</b>	-	-	60	-	-	0	0	-	-	0	3/4
04	<b>40</b>	-	-	40	-	-	0	0	-	-	0	3/4

		Age class distribution (plants per acre)					Utilization						
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)	
<i>Eriogonum microthecum</i>													
94	<b>120</b>	-	-	120	-	-	0	0	-	-	0	9/11	
99	<b>300</b>	-	100	200	-	-	27	0	-	-	0	7/6	
04	<b>200</b>	-	-	200	-	-	0	0	-	-	0	7/8	
<i>Gutierrezia sarothrae</i>													
94	<b>840</b>	120	40	720	80	-	0	0	10	5	5	7/11	
99	<b>720</b>	-	100	580	40	40	0	0	6	-	0	6/6	
04	<b>580</b>	-	40	540	-	-	0	0	0	-	0	7/9	
<i>Opuntia spp.</i>													
94	<b>160</b>	-	60	100	-	-	13	0	-	-	0	3/9	
99	<b>140</b>	20	20	120	-	-	0	0	-	-	0	4/10	
04	<b>160</b>	-	20	140	-	-	0	0	-	-	0	4/7	
<i>Pinus edulis</i>													
94	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-	
99	<b>20</b>	-	-	20	-	-	0	0	-	-	0	-/-	
04	<b>20</b>	-	-	20	-	-	0	0	-	-	0	-/-	