

Trend Study 19A-2-07

Study site name: Ochre Mountain .

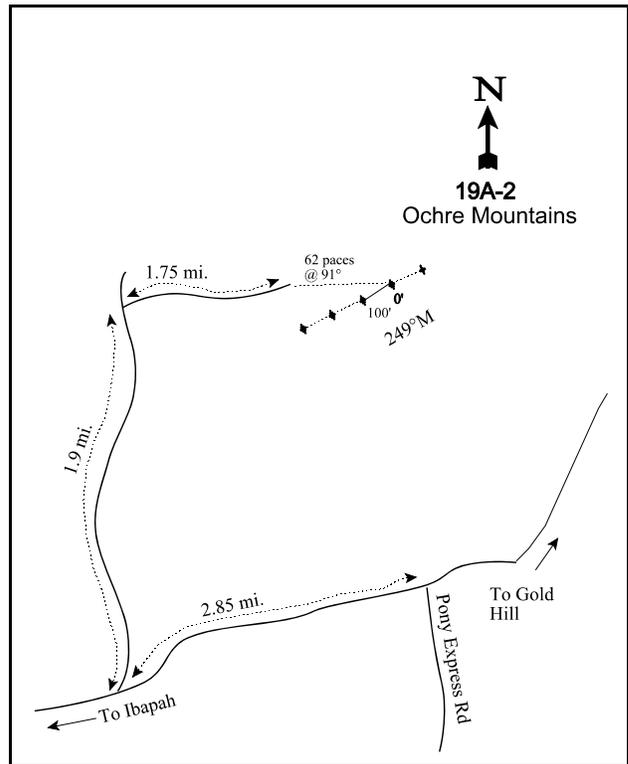
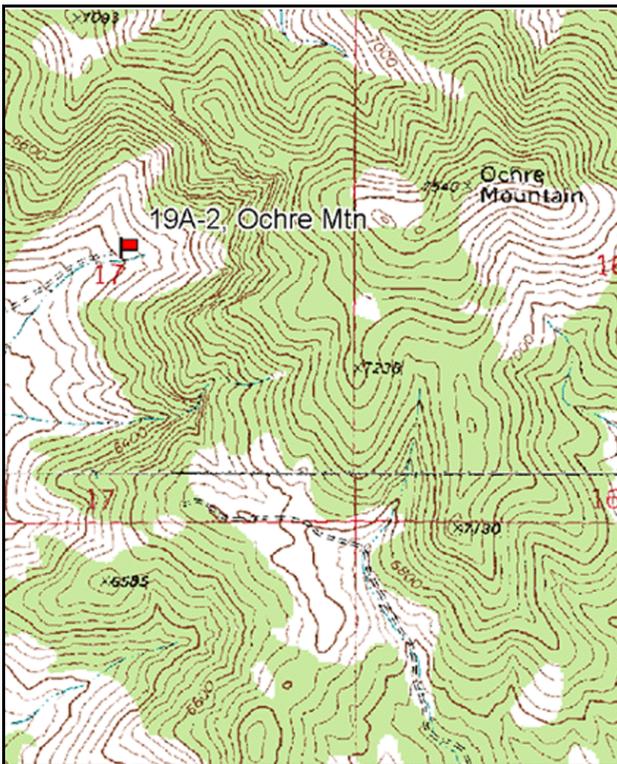
Vegetation type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 249 degrees magnetic.

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

LOCATION DESCRIPTION

From Gold Hill, proceed southwest toward Pony Express Road. From the intersection at Pony Express Rd, continue on main road (east) towards Ibapah for another 2.85 miles to an intersection going north (right). Take the road going north for 1.91 miles to a road going east (right). Turn right and go 1.75 miles to a small box canyon. Stop and walk 62 paces at an azimuth of 91 degrees true to a green steel "T" fencepost with a red browse tag, number 3931, attached. This marks the 0-foot stake of the baseline. The study is marked by green steel "T" fenceposts approximately 12 to 18 inches in height.



Map Name: Ochre Mountain

Diagrammatic Sketch

Township 8S, Range 18W, Section 17

GPS: NAD 83, UTM 12T 253042 E 4446321 N

## DISCUSSION

### Ochre Mountain - Trend Study No. 19A-2

#### Study Information

This study samples deer winter range on the west side of Ochre Mountain [elevation: 6,400 feet (1,940 m), slope: 15%-20%, aspect: west]. It samples a basin big sagebrush-grass community. The area is surrounded by steep, rocky pinyon-juniper hillsides which contain some Stansbury cliffrose. This transect is in the Ochre Mountain BLM grazing allotment, permitted for cattle use in winter and spring. From the pellet group transect, deer use was estimated at 44 days use/acre (107 ddu/ha) in 2002 and 1 day use/acre (3 ddu/ha) in 2007. The elk estimates were 15 days use/acre (36 edu/ha) in 2002 and 29 days use/acre (73 edu/ha) in 2007. The cattle estimates were 4 days use/acre (10 cdu/ha) in 2002 and 2007. The horse estimates were 5 days use/acre (12 hdu/ha) in 2007. In 2002, there was sign of wild horses and several rub trees severely damaged by big game. The deer and elk pellets sampled in 2002 and 2007 appeared to be primarily from winter or spring and the sampled cattle and horse appeared to be from the previous year. Previous to 2002, big game, wild horse and livestock use was reported light-moderate.

#### Soil

The soil is in the Spager series. These soils consists of shallow over a calcium carbonate cemented hardpan, somewhat excessively drained, and moderately-rapidly permeable. They formed in alluvium weathered mainly from limestone. Spager soils are on alluvial plains, fan remnants and hillslopes (USDA-NRCS 2007). The soil texture is loam with a neutral pH (7.1). Past soil erosion is evident by exposed rock, pavement, and the presence of pedestalled plants. Relative bare ground cover has been low (2%-4%) in all years, while the sum of vegetation and litter cover has been very high, an estimated 78%-88%. In 2002, the erosion condition was classified as stable. In 2007, the erosion condition was classified as slight due to some pedestalling, rills, flow patterns, and light litter and soil movement.

#### Browse

Browse composition consists almost entirely of basin big sagebrush (*Artemisia tridentata* spp. *tridentata*). Density was estimated at 2,720 plants/acre (6,718 plants/ha) in 1997, 1,820 plants/acre (4,495 plants/ha) in 2002, and 1,100 plants/acre (2,717 plants/ha) in 2007. The decrease in density may be due to self-thinning as evidenced by a 12 inch (30.5 cm) increase in the average crown width that occurred from 1997 to 2007. The population has consisted predominantly of mature and decadent plants. Percent decadency has been moderate-high all years, especially during drought periods in 1989 and 2002 (Utah Climate Summaries 2007). Plants classified as dying have increased from 3% of the population in 1989 to 27% in 2007. In all years recruitment has been very low. There has been a high proportion of plants in the population with poor vigor, and the highest levels occurred in 1989, 2002, and 2007. Many of the sagebrush plants showed insect damage in 2002 and some showed it in 2007. The population showed sagebrush defoliator moth (*Aroga websteri*) damage in 2007, and were infested by aphids and ants. Plant use has been light-moderate every year. Average annual leader growth was 1.7 inches (4.3 cm) in 2002 and 1 inch (2.5 cm) in 2007. Other shrubs sampled include narrowleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *stenophyllus*) and black sagebrush (*Artemisia nova*).

#### Herbaceous Understory

Cheatgrass (*Bromus tectorum*) cover has fluctuated between 8% and 13%. It is likely a fire hazard due to its abundance and distribution in the area. Although frequency and cover were not measured before 1997, it was noted from 1989 photographs that cheatgrass was less abundant prior to 1983. Average cover of perennial grasses increased from 9% in 1997 to 14% in 2007. Bluebunch wheatgrass (*Agropyron spicatum*), the dominant perennial grass, provided 8% cover in 1997, 11% in 2002, and 12% in 2007. Sandberg bluegrass (*Poa secunda*) is also moderately abundant, but has declined from a quadrat frequency of 56% in 1983 to 34% in 2007.

With one exception, forbs occur infrequently. Bonneville pea (*Lathyrus brachycalyx*) is moderately abundant with an average cover of 6% in 1997, 8% in 2002, and 12% in 2007. Other forbs sampled include false dandelion (*Agoseris glauca*), longleaf phlox (*Phlox longifolia*), low fleabane (*Erigeron pumilus*), rockcress (*Arabis* sp.), desert Indian paintbrush (*Castilleja chromosa*), and tumble mustard (*Sisymbrium altissimum*).

#### 1989 TREND ASSESSMENT

The browse trend is slightly down. The density of basin big sagebrush remained stable. The recruitment of young increased from 0% of the population to 10%, and decadence increased from 30% to 70%. and plants exhibiting poor vigor increased from 10% of the population to 55%. Browse use was mostly light-moderate. The grass trend is slightly down. The sum of nested frequency for perennial grasses decreased 13%. The forbs trend is up. The sum of nested frequency for perennial forbs increased 60%, and there were significant increases in the nested frequencies of peavine and longleaf phlox. Diversity also increased from three to seven species.

browse - slightly down (-1)      grass - slightly down (-1)      forb - up (+2)

#### 1997 TREND ASSESSMENT

The browse trend is up. Density of mature basin big sagebrush increased over two-fold. The recruitment of young decreased to 6% of the population, and decadence decreased to 33%. Plants classified as showing poor vigor decreased to 18% of the population. Although the percentage of plants with poor vigor decreased, almost all of those plants were classified as dying. There were no dead plants sampled in 1989, but there were 1,060 dead plants/acre (2,624 plants/ha) in 1997. The population appeared to be self-thinning, which could prove advantageous to its overall health. Browse use decreased to mostly light. The grass trend is slightly up. The sum of nested frequency for perennial grasses increased 16%. The nested frequency of bluebunch wheatgrass increased. This site exhibits low diversity, so an increase in any perennial species is beneficial. Because the sample area changed between these two readings, it is possible that the change in nested frequencies was slightly inflated. Annual grasses were included in the study for the first time. Cheatgrass was abundant, with 11% average cover. The forb trend is slightly down. The sum of the nested frequency of perennial forbs decreased 14%. Forbs, with the exception of peavine, were rare. The Desirable Components Index (DCI) score was fair due to the high browse cover, and high perennial grass and perennial forb cover. However, the high browse decadence, low recruitment of young browse, and moderate annual grass cover decreased the score.

winter range condition (DCI) - fair (50) Mid-level potential scale  
browse - up (+2)      grass - slightly up (+1)      forb - slightly down (-1)

#### 2002 TREND ASSESSMENT

The browse trend is down. Density of basin big sagebrush declined 33%. The recruitment of young decreased to 0% of the population and decadence increased to 51%. Plants classified as showing poor vigor increased to 26% of the population. Plants classified as dying remained high, indicating further losses in density could occur in the future. The density of dead plants increased to 1,580 plants/acre (3,911 plants/ha). Browse use remained mostly light. A high proportion of the population showed insect damage. Drought conditions and high densities of cheatgrass in the understory contributed to the poor sagebrush condition. The grass trend is stable. The sum of nested frequency for perennial grasses decreased 17%, though none of the species decreased at a significant level. However, cheatgrass decreased in nested frequency with the existing drought conditions, and this decrease contributed to the stable trend. The forb trend is up. The sum of the nested frequency for perennial forbs increased 22%. The DCI score remained fair.

winter range condition (DCI) - fair (49) Mid-level potential scale  
browse - down (-2)      grass - stable (0)      forb - up (+2)

2007 TREND ASSESSMENT

The browse trend is down. Density of basin big sagebrush declined 40%. The recruitment of young increased to 9% of the population and decadence decreased to 42%. Plants classified with poor vigor increased to 36% of the population, and browse use remained mostly light. Insect use was evident; many of the plants had use by ants and aphids, with some noticeable use by the sagebrush defoliator moth. The trend for grasses is stable. The sum of nested frequency of perennial grasses increased 3%. The sum of nested frequency for cheatgrass significantly increased. The forb trend is stable with no significant change. The DCI score remained fair.

winter range condition (DCI) - fair (53) Mid-level potential scale  
browse - down (-2)                      grass - stable (0)                      forb - stable (0)

HERBACEOUS TRENDS --  
 Management unit 19A, Study no: 2

T y p e	Species	Nested Frequency					Average Cover %		
		'83	'89	'97	'02	'07	'97	'02	'07
G	Agropyron cristatum	-	-	4	-	-	.18	-	-
G	Agropyron spicatum	<sub>a</sub> 119	<sub>ab</sub> 117	<sub>c</sub> 189	<sub>bc</sub> 159	<sub>c</sub> 177	7.63	11.31	12.28
G	Bromus tectorum (a)	-	-	<sub>b</sub> 329	<sub>a</sub> 270	<sub>b</sub> 311	10.92	7.61	12.58
G	Poa fendleriana	<sub>b</sub> 37	<sub>a</sub> 14	-	<sub>a</sub> 3	<sub>a</sub> 9	-	.00	.18
G	Poa secunda	<sub>b</sub> 153	<sub>ab</sub> 138	<sub>ab</sub> 121	<sub>a</sub> 98	<sub>a</sub> 83	1.63	.91	1.34
Total for Annual Grasses		0	0	329	270	311	10.92	7.61	12.58
Total for Perennial Grasses		309	269	314	260	269	9.44	12.23	13.81
Total for Grasses		309	269	643	530	580	20.36	19.85	26.40
F	Agoseris glauca	-	-	-	<sub>a</sub> 19	<sub>a</sub> 7	-	.14	.04
F	Arabis sp.	-	<sub>a</sub> 6	<sub>a</sub> 5	<sub>a</sub> 1	<sub>a</sub> 3	.01	.00	.03
F	Astragalus sp.	-	-	-	-	3	-	-	.03
F	Castilleja chromosa	-	<sub>a</sub> 2	<sub>a</sub> 1	-	-	.03	-	-
F	Cirsium sp.	-	-	-	-	-	.03	-	-
F	Crepis acuminata	-	-	<sub>a</sub> 3	<sub>a</sub> 2	<sub>a</sub> 8	.03	.01	.36
F	Delphinium nuttallianum	-	-	-	3	-	-	.00	-
F	Descurainia pinnata (a)	-	-	<sub>a</sub> 7	<sub>a</sub> 4	<sub>a</sub> 10	.02	.03	.05
F	Erigeron pumilus	-	<sub>a</sub> 8	<sub>a</sub> 3	-	-	.00	-	-
F	Hackelia patens	-	-	2	-	-	.00	-	-
F	Lathyrus brachycalyx	<sub>a</sub> 145	<sub>b</sub> 193	<sub>ab</sub> 182	<sub>b</sub> 196	<sub>b</sub> 206	5.74	8.05	11.60
F	Lappula occidentalis (a)	-	-	-	<sub>a</sub> 41	<sub>a</sub> 56	-	.79	.28
F	Lactuca serriola	-	-	-	4	-	-	.03	-
F	Lomatium sp.	-	-	-	3	-	-	.00	-
F	Machaeranthera canescens	-	<sub>a</sub> 1	<sub>a</sub> 1	-	-	.03	-	-
F	Oenothera sp.	-	8	-	-	-	-	-	-
F	Phlox longifolia	<sub>a</sub> 4	<sub>b</sub> 25	<sub>ab</sub> 13	<sub>b</sub> 28	<sub>ab</sub> 15	.06	.14	.11
F	Sisymbrium altissimum (a)	-	-	<sub>a</sub> 12	<sub>a</sub> 14	<sub>b</sub> 32	.08	.35	.89

Type	Species	Nested Frequency					Average Cover %		
		'83	'89	'97	'02	'07	'97	'02	'07
F	Unknown forb-perennial	3	-	-	-	-	-	-	-
Total for Annual Forbs		0	0	19	59	98	0.10	1.17	1.23
Total for Perennial Forbs		152	243	210	256	242	5.96	8.40	12.17
Total for Forbs		152	243	229	315	340	6.06	9.57	13.40

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

#### BROWSE TRENDS --

Management unit 19A, Study no: 2

Type	Species	Strip Frequency			Average Cover %		
		'97	'02	'07	'97	'02	'07
B	Artemisia nova	5	6	7	.33	.36	.46
B	Artemisia tridentata tridentata	64	50	38	16.40	16.31	14.03
B	Chrysothamnus viscidiflorus stenophyllus	18	14	14	.30	.71	1.28
B	Chrysothamnus viscidiflorus viscidiflorus	0	0	1	-	-	-
Total for Browse		87	70	60	17.04	17.38	15.78

#### CANOPY COVER, LINE INTERCEPT --

Management unit 19A, Study no: 2

Species	Percent Cover	
	'02	'07
Artemisia nova	.33	.38
Artemisia tridentata tridentata	13.25	17.56
Chrysothamnus viscidiflorus stenophyllus	.31	1.43

#### KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 19A, Study no: 2

Species	Average leader growth (in)	
	'02	'07
Artemisia tridentata tridentata	1.7	1.0

BASIC COVER --

Management unit 19A, Study no: 2

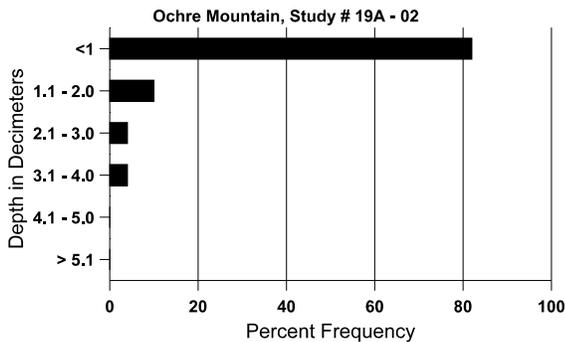
Cover Type	Average Cover %				
	'83	'89	'97	'02	'07
Vegetation	2.00	12.00	39.64	45.36	51.31
Rock	6.75	11.50	5.11	8.21	3.76
Pavement	14.50	11.00	8.30	12.71	6.20
Litter	69.75	62.00	53.55	49.91	40.81
Cryptogams	1.75	1.25	1.38	1.75	.13
Bare Ground	5.25	2.25	2.58	4.92	2.32

SOIL ANALYSIS DATA --

Herd Unit 19A, Study no: 2, Ochre Mountain

Effective rooting depth (in)	Temp °F (depth)	pH	Loam			%OM	ppm P	ppm K	dS/m
			%sand	%silt	%clay				
15.2	61.0 (16.5)	7.1	50.0	32.4	17.6	3.4	7.6	150.4	1.0

Stoniness Index



PELLET GROUP DATA --

Management unit 19A, Study no: 2

Type	Quadrat Frequency		
	'97	'02	'07
Rabbit	1	2	5
Horse	1	1	1
Elk	-	5	10
Deer	5	18	5
Cattle	5	3	1

Days use per acre (ha)	
'02	'07
-	-
-	5 (12)
15 (36)	29 (73)
44 (107)	1 (3)
3 (9)	4 (11)

BROWSE CHARACTERISTICS --  
Management unit 19A, Study no: 2

		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>Artemisia nova</b>												
83	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
89	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
97	<b>220</b>	-	-	180	40	40	0	0	18	18	18	9/17
02	<b>260</b>	-	-	140	120	220	54	15	46	-	0	14/23
07	<b>360</b>	-	40	120	200	280	0	0	56	22	22	12/25
<b>Artemisia tridentata tridentata</b>												
83	<b>1333</b>	-	-	933	400	-	45	5	30	-	10	43/45
89	<b>1332</b>	-	133	266	933	-	50	5	70	10	55	35/39
97	<b>2720</b>	20	160	1660	900	1060	15	4	33	18	18	34/47
02	<b>1820</b>	-	-	900	920	1580	15	12	51	26	26	36/46
07	<b>1100</b>	20	100	540	460	900	16	0	42	27	27	39/59
<b>Chrysothamnus viscidiflorus stenophyllus</b>												
83	<b>400</b>	-	-	400	-	-	0	0	0	-	0	19/20
89	<b>133</b>	-	-	-	133	-	0	0	100	-	50	-/-
97	<b>460</b>	-	-	420	40	40	0	0	9	9	9	18/24
02	<b>340</b>	-	-	320	20	20	0	0	6	-	0	15/23
07	<b>300</b>	-	40	240	20	-	0	0	7	-	0	16/29
<b>Chrysothamnus viscidiflorus viscidiflorus</b>												
83	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
89	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
97	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
02	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
07	<b>20</b>	-	-	20	-	-	0	0	-	-	0	14/28