

Trend Study 30-41-03

Study site name: Joe Spring .

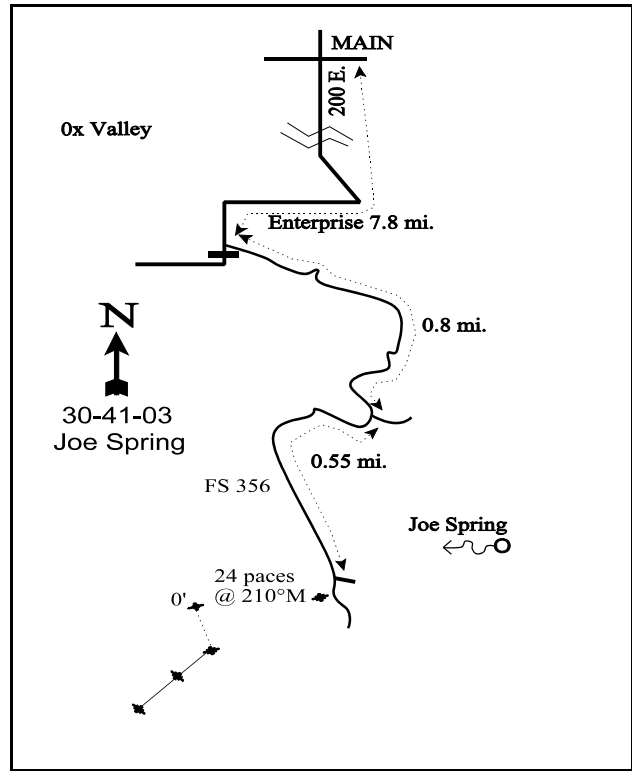
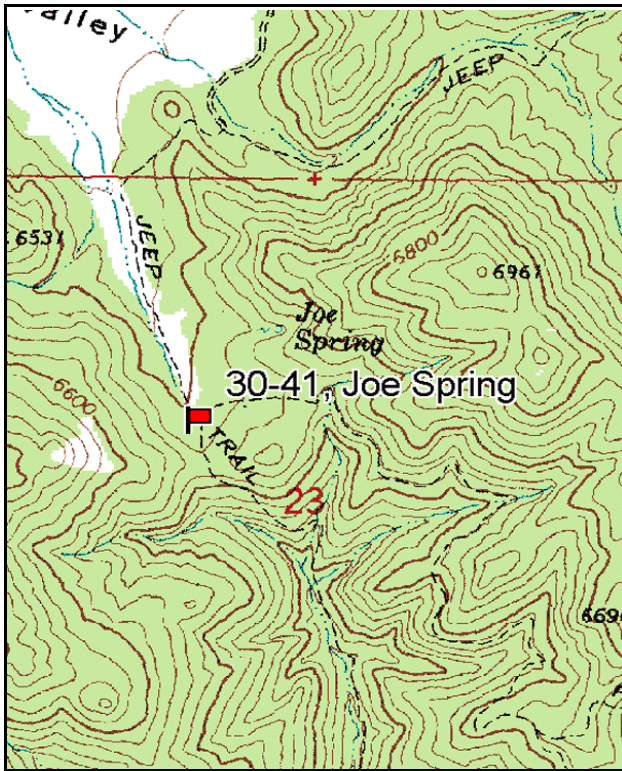
Vegetation type: Mountain Brush .

Compass bearing: frequency baseline 152 degrees magnetic. (Lines 2 & 3, 231°M)

Frequency belt placement: line 1 (1 & 93ft), line 2 (71ft), line 3 (34 & 59ft).

LOCATION DESCRIPTION

From 200 East and Main in Enterprise, travel southwest 7.8 miles to Ox Valley. Take a left at the ranch gate and continue east and south 0.8 miles to the next fork. Turn right on FS road 356 and travel 0.55 miles to the next fork at Joe Spring. From the intersection walk up the right fork 32 paces to a full-high marker post on the right side of the road. The 0-foot baseline is 24 paces at 210 degrees magnetic and is marked by browse tag #7015. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height.



Map Name: Central West

Diagrammatic Sketch

Township 38S, Range 17W, Section 23

GPS: NAD 27, UTM 12S 4150194 N, 258751 E

DISCUSSION

Joe Spring - Trend Study No. 30-41

This trend study is located on deer transitional/summer range on the south end of Ox Valley. Elevation at the site is approximately 6,400 feet with a 15% slope and east aspect. The range type is mixed mountain brush. The entire area surrounding Ox Valley receives heavy deer and cattle use. During study site establishment in 1982, cattle were in the area and several does with fawns were also observed. Pellet group data taken on the site in 1998 estimated 58 deer and 10 cow days use/acre (143 ddu/ha and 25 cdu/ha). Pellet group data from 2003 estimated 32 deer days use/acre (79 ddu/ha). No cattle had been on the site by the June 5th reading data but about 5 cow days use/acre was estimated from the previous summer. There is a water source and salt lick within ½ mile of the site. Mormon crickets were abundant in 2003.

Soils are coarse textured and rocky, but deep. Parent material is granite. Effective rooting depth is estimated at 18 inches. Texture is a sandy loam which is moderately acidic (pH 5.7). Ground cover from vegetation and litter is unevenly distributed, yet is an effective barrier to soil movement. Bare ground, which accounts for about 20% of the ground surface, is largely the result of livestock trailing and some deer trails which terrace the slope. There is some limited erosion occurring and the erosion condition class was determined to be slight in 2003.

Browse composition is diverse and overall productivity is high. The principal species include mountain big sagebrush, true mountain mahogany, Gambel oak, Utah serviceberry, mountain snowberry, and a few less desirable shrubs. Utah serviceberry decreased in density between 1982 and 1992. Percent decadence also increased and the proportion of individuals heavily hedged went up (33% to 43%). Gambel oak increased in density 43% between 1982 and 1992. During the 1998 reading, the study site baseline was extended from the original 100 ft to 300 ft in order to get a better sample. The original 3 circular shrub density plots were replaced with 5, 1/100th acre density strips. This much larger sample better estimates shrub densities which are very clumped on the Joe Spring site. As a result, density of many of the shrub species changed. Utah serviceberry density increased from 466 plants/acre estimated in 1992 to 4,640 in 1998. Due to the thick nature of the serviceberry on the site, individual stems were counted since individual plants were hard to distinguish. Serviceberry currently ('03) accounts for 24% of the browse cover. Utilization is moderate to heavy where available, vigor remains good, and percent decadence low.

Mountain big sagebrush has a moderate density which has remained similar since 1998 at around 2,000 plants/acre. It has displayed mostly light to moderate use during all readings and normal vigor on most plants. The number of decadent plants in the population remained low between 1982 and 1998, although it has risen to a moderate level of 30% in 2003. Reproduction was good in previous years, but no seedlings or young were encountered in 2003.

True mountain mahogany is very clumped in its distribution and it appears that past samples overestimated mahogany density. Density was estimated at 1,732 plants/acre in 1982 and 1,132 in 1992. These plants displayed heavy use with reduced vigor. Density counts from 1998 estimate only 20 mature plants/acre, all of which displayed heavy use. There were no dead plants sampled, so it appears that the change in sample size is the reason for the decline in density. No mahogany was sampled within the shrub density strips in 2003, but some plants were measured for height and crown.

A relatively stable population of Gambel oak provides about one-third of the total browse cover. Vigor was reduced in 29% of the plants sampled in 1998. This was due to the late frosts from the spring of that year but average vigor was normal in 2003.

Grasses, although fairly diverse, are not very abundant. Eight perennial grass species were encountered in 1998 and 7 species in 2003. Mutton bluegrass, bottlebrush squirreltail, and prairie junegrass are fairly

abundant. Cheatgrass brome was present in 1992 and it appeared to have increased significantly since the first reading in 1982. It was reported to dominate the understory in 1992, however annuals were not included in the previous surveys. In 1998, cheatgrass dominated the herbaceous understory by providing 68% of the total grass cover and 30% of the total herbaceous cover. Its dominance expanded in 2003, increasing to 82% of the total grass cover.

Forbs are a key vegetative element for transitional and summer range. They are fairly diverse and abundant, yet probably still below optimum for this type of site. The more important forbs include lupine, arrowleaf balsamroot, and redroot eriogonum. Overall, utilization of forbs is moderate with slightly heavier use on lupine, redroot eriogonum, and American vetch. The annual forb, littleflower collinsia, is very abundant and was growing in thick patches in 1998. It provided 28% of the forb cover in 1998 but only 9% in 2003. The native perennial forbs, desert phlox and American vetch, are the most abundant species, producing 28% of the forb cover in 1998 and 24% in 2003.

1982 APPARENT TREND ASSESSMENT

Overall range trend appears stable, even though utilization of the preferred browse species is relatively heavy. The rate of erosion is greater than it should be, although it is not currently a serious problem. Understory composition and density are fair and could be better.

1992 TREND ASSESSMENT

The soil trend has improved since 1982. Basal vegetative cover has more than doubled, whereas bare ground has decreased 30%. The browse trend is down due to significant decreases in density and increases in percent decadence of the two preferred browse species. Utah serviceberry decreased in density by 71% while the proportion of decadent and heavily hedged plants increased. Mountain mahogany saw a 35% decrease in its density, and an increase in percent decadence from 15% to 41%. Quadrat frequency of perennial grasses remained basically unchanged. Cheatgrass brome appears to have increased. It was not included in the analysis because it is an annual. Quadrat frequency of forbs increased slightly. Trend for herbaceous understory is stable.

TREND ASSESSMENT

soil - up (5)

browse - down (1)

herbaceous understory - stable (3)

1998 TREND ASSESSMENT

Trend for soil is stable with similar ground cover characteristics compared to 1992. Litter cover declined from 67% in 1982 to 64% in 1992, and 47% by 1998. It appears that the difference is due to including dried up cheatgrass as litter in 1982 and 1992, instead of classifying it as vegetation cover. Trend for the key browse species, serviceberry and mountain big sagebrush, is up slightly. Utilization of serviceberry is more moderate and percent decadence has declined from 14% to 6%. Reproduction is poor however. Sagebrush displays improved vigor, lower decadence, and good reproduction. Only one mountain mahogany plant was encountered with the larger sampling design. It appears that there are only a few isolated clumps on the site. They are heavily utilized, but do not occur in high enough numbers to be considered a key browse species. Gambel oak appears to be increasing. It was reportedly heavily hedged in 1992, but current use is light. A continued increase in oak will come at the expense of more desirable shrubs and herbaceous plants. Trend for the herbaceous understory is up. Sum of nested frequency for perennial grasses has remained similar, although frequency of perennial forbs has doubled.

TREND ASSESSMENT

soil - stable (3)

browse - up slightly (4)

herbaceous understory - up (5)

2003 TREND ASSESSMENT

Trend for soil is stable with similar ground cover characteristics compared to 1998. There is some limited erosion occurring, mostly along trails. An erosion condition class was determined to be slight in 2003. Trend for the key browse species, serviceberry and mountain big sagebrush, is mixed. Trend for serviceberry is stable. The population density of serviceberry increased, while serviceberry on this site grows in thick clones similar to oakbrush. Individual stems were counted in 1998 and 2003. However, due to the large numbers of stems and difficulty counting within thick clones, it is better to concentrate on other factors to determine trend. Average cover of serviceberry declined slightly from 8.6% in 1998 to 7% in 2003. Strip frequency remained similar. Utilization was heavy on plants along the outer edges of the thick stands but lighter within. Vigor remained good and the number of decadent stems is low. Mountain big sagebrush declined slightly in density (11%) and remained at nearly 2,000 plants/acre. The drop in density comes mostly from the young age class which accounted for 21% of the population in 1998. It declined to 0% in 2003. Utilization remained light to moderate and vigor normal on most plants. The number of decadent plants did increase to 30% which is a cause for some concern. A third of the decadent plants sampled were classified as dying. It appears that drought combined with the thick competitive cheatgrass understory has caused some of these trends. The sagebrush population may decline slightly in the future but most of the plants on the site are vigorous and healthy. Annual leader growth was good in 2003 averaging nearly 2 inches. Trend for sagebrush is considered slightly down. Weighing all these factors, the overall browse trend is considered slightly down since sagebrush provides a majority of the preferred browse cover. This area is considered transitional/summer range so the herbaceous component is the most important aspect. The herbaceous understory on this site is diverse but poor. Perennial grasses are not abundant and confined mostly to growing within shrub canopies. Cheatgrass still dominates the herbaceous understory by providing 82% of the grass cover and 49% of the total herbaceous cover. The only somewhat common perennial grasses are mutton bluegrass, prairie junegrass, and bottlebrush squirreltail. Forbs are very diverse with 22 species sampled in 2003. Few species are abundant however. They include arrowleaf balsamroot, silky lupine, desert phlox and American vetch. Drought conditions combined with Mormon cricket use have caused a major decline in the nested frequency of perennial forbs. Eleven perennial species declined significantly in nested frequency since 1998. Trend is considered down for the herbaceous understory.

TREND ASSESSMENT

soil - stable (3)

browse - down slightly (2)

herbaceous understory - down (1)

HERBACEOUS TRENDS --
Management unit 30 , Study no: 41

T y p e	Species	Nested Frequency			Average Cover %	
		'92	'98	'03	'98	'03
G	Agropyron intermedium	ab12	a1	b22	.00	.32
G	Agropyron smithii	b16	ab6	a-	.02	-
G	Agropyron spicatum	b56	a11	a1	.19	.03
G	Bouteloua gracilis	10	-	3	-	.06
G	Bromus carinatus	13	22	3	.37	.03
G	Bromus tectorum (a)	-	285	273	12.32	15.36
G	Koeleria cristata	a-	a-	b47	-	.68
G	Oryzopsis hymenoides	2	-	-	-	-
G	Poa fendleriana	a3	c85	b48	4.46	1.70
G	Poa pratensis	-	8	-	.18	-
G	Sitanion hystrix	b30	a15	b30	.63	.64
G	Stipa comata	9	2	-	.03	-
Total for Annual Grasses		0	285	273	12.32	15.36
Total for Perennial Grasses		151	150	154	5.89	3.47
Total for Grasses		151	435	427	18.22	18.84
F	Agoseris glauca	a-	b34	a9	.29	.02
F	Allium spp.	a-	b57	a-	.48	-
F	Arabis spp.	-	5	-	.16	.00
F	Artemisia ludoviciana	b30	a3	a5	.00	.06
F	Aster chilensis	a-	b28	a-	.09	-
F	Astragalus spp.	a2	b13	a-	.11	-
F	Balsamorhiza sagittata	a3	b33	b27	2.40	5.38
F	Calochortus nuttallii	a-	b8	a-	.03	-
F	Collomia linearis (a)	-	-	1	-	.00
F	Comandra pallida	17	18	13	.16	.10
F	Collinsia parviflora (a)	-	b283	a102	6.48	1.16
F	Crepis acuminata	a-	b11	a-	.27	-
F	Cymopterus spp.	a-	b36	a-	.32	-
F	Epilobium brachycarpum (a)	-	-	2	-	.03
F	Erigeron eatonii	11	15	24	.35	.26
F	Erigeron spp.	a-	b17	a2	.17	.00
F	Eriogonum racemosum	2	6	3	.21	.00
F	Eriogonum umbellatum	-	-	2	-	.00
F	Galium spp.	-	7	12	.01	.71
F	Hackelia patens	a-	b22	a-	.30	-

Type	Species	Nested Frequency			Average Cover %	
		'92	'98	'03	'98	'03
F	<i>Hydrophyllum occidentale</i>	-	-	3	-	.03
F	<i>Lappula occidentalis</i> (a)	-	-	4	-	.16
F	<i>Linum lewisii</i>	-	2	-	.15	-
F	<i>Lomatium</i> spp.	-	1	-	.03	-
F	<i>Lupinus argenteus</i>	_b 84	_a 30	_a 15	1.29	1.52
F	<i>Machaeranthera canescens</i>	_b 18	_a 3	_a -	.00	-
F	<i>Microsteris gracilis</i> (a)	-	25	11	.16	.13
F	<i>Penstemon</i> spp.	-	4	-	.04	-
F	<i>Phlox austromontana</i>	_a 85	_b 124	_b 112	6.40	2.80
F	<i>Phacelia heterophylla</i>	1	6	-	.79	-
F	<i>Polygonum douglasii</i> (a)	-	-	2	-	.00
F	<i>Senecio multilobatus</i>	_a -	_a -	_b 14	-	.07
F	<i>Sphaeralcea grossulariaefolia</i>	-	1	2	.03	.03
F	<i>Stephanomeria tenuifolia</i>	_a -	_b 11	_a -	.12	-
F	Unknown forb-annual (a)	-	4	-	.09	-
F	Unknown forb-perennial	-	5	-	.03	-
F	<i>Vicia americana</i>	_b 54	_c 101	_a 29	2.21	.19
Total for Annual Forbs		0	312	122	6.73	1.49
Total for Perennial Forbs		307	601	272	16.52	11.22
Total for Forbs		307	913	394	23.25	12.72

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

BROWSE TRENDS --

Management unit 30 , Study no: 41

Type	Species	Strip Frequency		Average Cover %	
		'98	'03	'98	'03
B	Amelanchier utahensis	26	25	8.55	7.09
B	Artemisia tridentata vaseyana	61	53	10.19	8.72
B	Cercocarpus ledifolius	1	0	-	-
B	Cercocarpus montanus	1	0	-	-
B	Chrysothamnus depressus	3	0	.03	-
B	Chrysothamnus viscidiflorus viscidiflorus	26	25	1.43	1.46
B	Eriogonum microthecum	0	6	-	.57
B	Opuntia spp.	1	1	.03	.15
B	Quercus gambelii	34	34	10.28	10.94
B	Ribes spp.	1	1	.38	-
B	Symphoricarpos oreophilus	3	2	.33	.18
B	Tetradymia canescens	0	2	.03	.03
Total for Browse		157	149	31.28	29.14

CANOPY COVER, LINE INTERCEPT --

Management unit 30 , Study no: 41

Species	Percent Cover	
	'98	'03
Amelanchier utahensis	-	7.59
Artemisia tridentata vaseyana	-	9.23
Chrysothamnus viscidiflorus viscidiflorus	-	1.85
Eriogonum microthecum	-	.16
Quercus gambelii	10.80	13.93
Symphoricarpos oreophilus	-	.28

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 30 , Study no: 41

Species	Average leader growth (in)
	'03
Amelanchier utahensis	2.4
Artemisia tridentata vaseyana	1.8

BASIC COVER --

Management unit 30 , Study no: 41

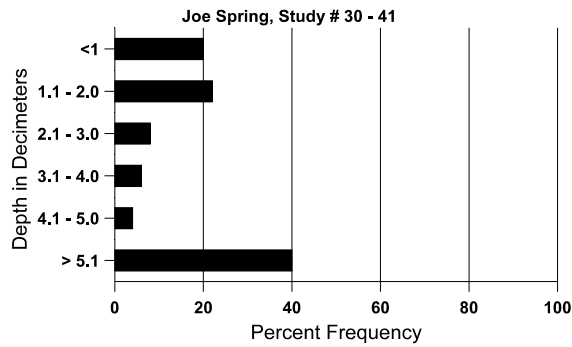
Cover Type	Average Cover %		
	'92	'98	'03
Vegetation	3.00	59.19	56.87
Rock	3.00	7.60	7.53
Pavement	26.00	4.94	6.17
Litter	49.00	46.79	35.79
Bare Ground	21.00	20.56	18.29

SOIL ANALYSIS DATA --

Management unit 30, Study no: 41, Study Name: Joe Spring

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
18.0	59.5 (16.7)	5.7	68.0	17.4	14.6	1.8	15.0	150.4	0.4

Stoniness Index



PELLET GROUP DATA --

Management unit 30 , Study no: 41

Type	Quadrat Frequency		Days use per acre (ha)	
	'98	'03	'98	'03
Rabbit	3	3	-	-
Deer	30	11	39 (96)	32 (79)
Cattle	2	3	10 (25)	5 (13)

BROWSE CHARACTERISTICS --
Management unit 30 , Study no: 41

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Amelanchier utahensis											
82	1599	66	200	1333	66	-	0	33	4	0	46/11
92	466	-	200	200	66	-	0	43	14	0	20/36
98	4640	-	60	4300	280	220	51	13	6	0	45/33
03	5480	60	300	4860	320	420	.72	36	6	3	47/47
Artemisia tridentata vaseyana											
82	1266	-	133	1000	133	-	5	0	11	0	24/32
92	1332	66	266	800	266	-	15	5	20	15	22/27
98	2220	500	460	1480	280	420	29	5	13	3	22/33
03	1980	-	-	1380	600	220	20	9	30	9	24/29
Cercocarpus ledifolius											
82	0	-	-	-	-	-	0	0	-	0	-/-
92	66	-	66	-	-	-	0	0	-	0	-/-
98	40	-	40	-	-	-	0	0	-	0	-/-
03	0	-	-	-	-	-	0	0	-	0	-/-
Cercocarpus montanus											
82	1732	-	1066	400	266	-	0	100	15	15	8/6
92	1132	200	533	133	466	-	35	53	41	18	6/7
98	20	-	-	20	-	-	0	100	0	0	14/20
03	0	-	-	-	-	-	0	0	0	0	22/29
Chrysothamnus depressus											
82	0	-	-	-	-	-	0	0	-	0	-/-
92	0	-	-	-	-	-	0	0	-	0	-/-
98	80	-	-	80	-	-	25	0	-	0	8/15
03	0	-	-	-	-	-	0	0	-	0	-/-
Chrysothamnus viscidiflorus viscidiflorus											
82	1066	-	-	1066	-	-	0	0	0	0	15/29
92	0	-	-	-	-	-	0	0	0	0	-/-
98	960	40	140	780	40	60	0	4	4	0	14/24
03	700	-	20	660	20	-	0	0	3	0	14/18
Eriogonum microthecum											
82	266	-	-	266	-	-	0	0	-	0	5/15
92	66	-	-	66	-	-	0	0	-	0	6/9
98	0	-	-	-	-	-	0	0	-	0	-/-
03	180	-	20	160	-	-	11	0	-	0	7/16

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Opuntia spp.											
82	0	-	-	-	-	-	0	0	-	0	-/-
92	0	-	-	-	-	-	0	0	-	0	-/-
98	20	-	-	20	-	-	0	0	-	0	-/-
03	20	-	-	20	-	-	0	0	-	0	3/20
Quercus gambelii											
82	1066	-	333	733	-	-	13	31	0	0	47/23
92	1865	800	733	466	666	-	7	79	36	0	71/47
98	4920	340	1180	3360	380	240	6	0	8	29	35/31
03	8720	20	1900	6320	500	540	18	1	6	.91	37/22
Quercus turbinella											
82	0	-	-	-	-	-	0	0	-	0	-/-
92	0	-	-	-	-	-	0	0	-	0	-/-
98	0	-	-	-	-	-	0	0	-	0	35/20
03	0	-	-	-	-	-	0	0	-	0	-/-
Ribes spp.											
82	0	-	-	-	-	-	0	0	-	0	-/-
92	0	-	-	-	-	-	0	0	-	0	-/-
98	20	-	-	20	-	-	0	0	-	0	57/58
03	20	-	-	20	-	-	0	0	-	0	54/40
Symphoricarpos oreophilus											
82	666	-	-	666	-	-	0	0	0	0	25/22
92	599	-	333	200	66	-	22	0	11	0	19/29
98	560	120	300	260	-	-	14	0	0	0	12/17
03	80	-	-	80	-	-	0	0	0	0	20/41
Tetradymia canescens											
82	66	-	-	66	-	-	0	0	-	0	12/15
92	199	-	133	66	-	-	33	0	-	0	11/14
98	0	-	-	-	-	-	0	0	-	0	-/-
03	80	-	60	20	-	-	0	0	-	0	31/36