

Trend Study 30-38-08

Study site name: Wide Canyon .

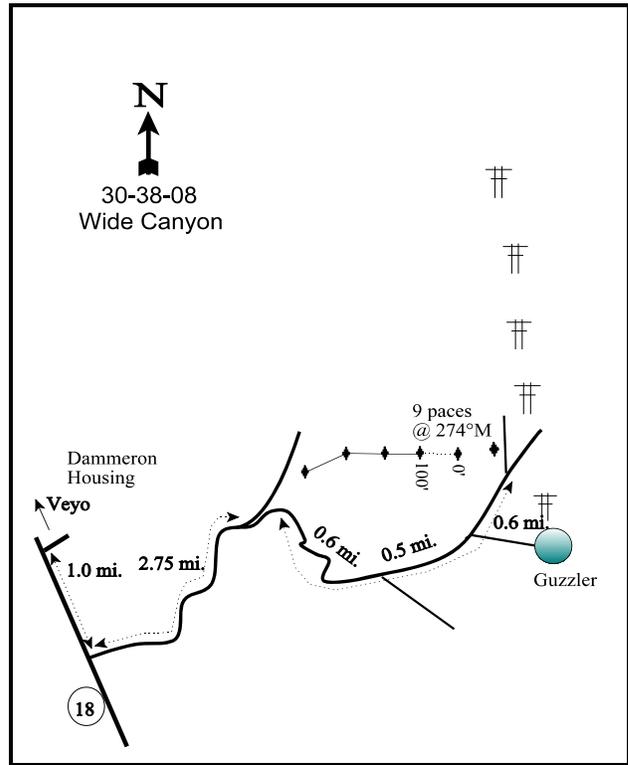
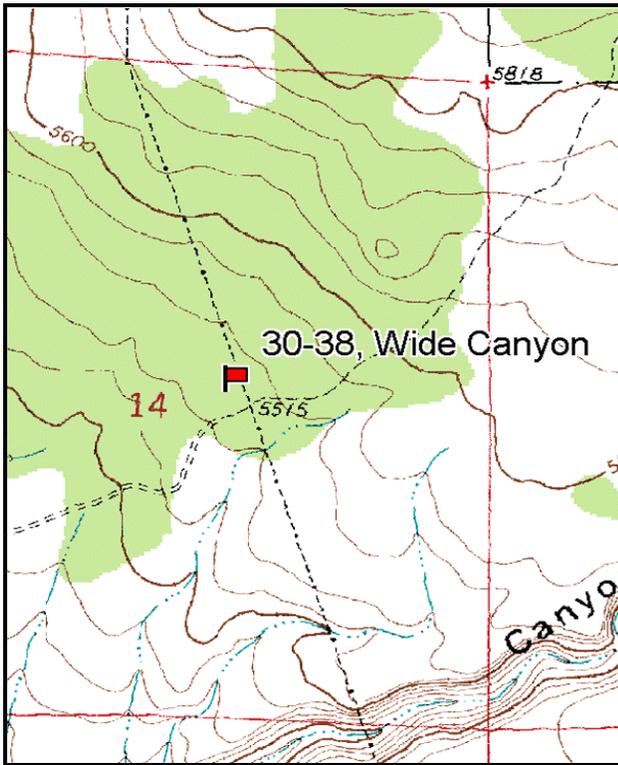
Vegetation type: Mountain Brush .

Compass bearing: frequency baseline 276 degrees magnetic. (Line 4, 228°M)

Frequency belt placement: line 1 (8 & 85ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the town of Veyo at the intersection of Hwy 18 and Center Street, proceed south 3.8 miles, at which point a road takes off to the east. Proceed east on this road for approximately 2.75 miles to a fork in the road. Take the right fork for an additional 1.75 miles to the point where the road crosses under power lines. At this point there is a road going north. The witness post is about 100 yards down this road. From the witness post the 0-foot stake is 9 paces at 274 degrees magnetic. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height. Line 3 is only 90 feet long.



Map Name: Saddle Mountain

Diagrammatic Sketch

Township 40S, Range 16W, Section 14

GPS: NAD 83, UTM 12S 268337 E, 4132238 N

DISCUSSION

Wide Canyon - Trend Study No. 30-38

Study Information

This study is located on deer winter range on the north side of Wide Canyon [elevation: 5,500 feet (1,676 m), slope: 3%-7%, aspect: south]. Vegetation characteristics of the community were essentially two-tiered. There was a scattered overstory of Utah juniper (*Juniperus osteosperma*) and large tree-like Stansbury cliffrose (*Cowania mexicana* ssp. *stansburiana*) underlain by a rather sparse cover of lower growing shrubs and a dense carpet of cheatgrass (*Bromus tectorum*). The Dameron complex fire burned 3,380 acres (1,368 ha) in the area in 2004 and the area was aerially seeded that winter. Deer use, estimated by a nearby DWR pellet group transect, averaged 23 deer days use/acre (57 ddu/ha) between 1982 and 1992, with a high of 39 ddu/acre (96 ddu/ha) in 1989-90, and a low of 14 ddu/acre (35 ddu/ha) in 1991-92. Pellet group data taken along the study site baseline estimated deer use to be very heavy in 1998 (121 ddu/acre:299 ddu/ha), and decreased to heavy use in 2003 and 2008 (64 ddu/acre:158 ddu/ha and 45 ddu/acre:111 ddu/ha, respectively). Cattle use has been estimated to be very light to light from 1998 to 2008 (4 to 11 days cattle use/acre:9 to 27 cdu/ha).

Soil

This study is located on a lava flow with many variable sized basalt rocks littering the ground surface. However, these are interspersed with larger areas occupied by smaller size fragments. Much of this finer material has probably been deposited through sedimentation from above. Effective rooting depth was estimated at almost 17 inches. Soil texture is a clay loam which is slightly acidic (pH 6.5). Erosion is not a problem on this site due to the level terrain, combined with adequate protective ground cover. Relative combined vegetation and litter cover ranged from 55%-66% from 1998 to 2008. Relative combined pavement and litter ranged from 22%-26% from 1998 to 2008. The soil erosion condition was classified as stable in 2003 and 2008.

Browse

Due to the recent fire, most of the browse species were highly reduced in 2008. The key browse species are mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and Stansbury cliffrose (*Cowania mexicana* ssp. *stansburiana*). Sagebrush density is low on this site producing only 4% cover in 1998 and 3% in 2003. Density increased from 799 plants/acre in 1982, to 1,599 by 1992, and 1,560 by 1998. Reproduction was good in 1992 with excellent seed production. By 1998, recruitment is still adequate but seed production was poor. The sagebrush population declined by 53% to 740 plants/acre in 2003, most likely due to drought conditions. Young plants also declined in 2003 to just 8% of the population. Utilization of sagebrush on this site has been moderate to heavy during most readings. There were no sagebrush encountered in 2008.

Prior to the fire, the cliffrose plants were principally large tree-like forms which were at least partially unavailable because of height. Utilization of the available portion was moderate to heavy. Density of cliffrose decreased steadily from 466 plants/acre in 1992 to 80 plants/acre in 2003, and to just 20 plants/acre after the fire in 2008. Seedling and young recruitment was low to absent from 1998 to 2008. Green ephedra (*Ephedra viridis*) offered some additional forage for wintering big game. It was moderately abundant from 1992 to 2003, but was mostly unutilized. No ephedra was encountered in 2008. A small number of the seeded species forage kochia (*Kochia prostrata*) were sampled in 2008.

Large juniper trees were found throughout the site prior to the fire. Juniper accounted for 40% of the total browse cover in 1998, 50% in 2003, and 41% in 2008, with a line intercept canopy cover value of 17%, 18%, and 4%, respectively. Point-quarter data from 1998 and 2003 estimated 34 juniper trees/acre with an average basal diameter of 11 inches. There was only one tree measured on the site in 2008, so point-quarter estimates are less than 18 trees/acre.

Herbaceous Understory

The herbaceous understory is very poor and perennial grasses and forbs are quite rare. Cheatgrass is very abundant, but was not included in sampling prior to the 1998 reading because it is an annual. Cheatgrass made up 99% of the total grass cover in 1998 and 2003, and 86% of the cover in 2008, after the fire. A few perennial grasses including galleta (*Hilaria jamesii*), Indian ricegrass (*Oryzopsis hymenoides*), and bottlebrush squirreltail (*Sitanion hystrix*) are occasionally found. A few seeded perennial grass species were sampled in 2008, but at very low frequency and cover. Forbs combine to produce less than 2% cover in 1998 to 2003, but increased markedly in 2008 to 14%.

Dameron Fire Aerial Seed Mix

Seeded Species	lbs./acre
Pubescent Wheatgrass	2.50
Hycrest Wheatgrass	2.50
Indian Ricegrass	0.50
Sideoats Grama	0.50
Galleta	0.20
Thickspike Wheatgrass	0.50
Sand Dropseed	0.20
Lewis Flax	0.50
Small Burnet	0.50
Alfalfa	0.50
Yellow Sweetclover	0.50
Bee Plant	0.10
Fourwing Saltbush	0.10
Winterfat	0.25
Blanket Flower	0.10
Forage Kochia	1.00

1992 TREND ASSESSMENT

Trend for browse is slightly up. The density of the primary browse species, mountain big sagebrush, increased by 50% from 1982 to 1,599 plants/acre. Sagebrush vigor was good, and decadence was low. The population of Stansbury cliffrose stayed relatively constant, though decadence increased to 36%. Data in 1982 for the herbaceous understory is limited to species quadrat frequencies. With that in mind, trend for both grasses and forbs is considered to be stable. Grass and forb species are slightly increasing and are not utilized much on this site.

browse - slightly up (+1)

grass - stable (0)

forb - stable (0)

1998 TREND ASSESSMENT

Trend for browse is slightly down. Mountain big sagebrush makes up 19% of the browse cover, or 80% of the preferred browse cover. Differences in density of browse species may be related to the larger sample area used in 1998; therefore, trend for browse was determined using other parameters. Sagebrush decadence has increased from 19% in 1992 to 29%, and vigor declined with the proportion of plants with poor vigor increased from 6% in 1992 to 18%. Recruitment of sagebrush was good with young plants comprising 22% of the population. Cliffrose vigor is normal and there are currently no plants classified as decadent. A negative aspect of the browse trend is the relatively large density of broom snakeweed (*Gutierrezia sarothrae*) at 7,400

plants/acre. Most of the plants are mature (93%) indicating a possibly stable population. Trend for both the grasses and forbs is down. Perennial grasses and forbs are lacking and both have declined in sum of nested frequency since 1992. The herbaceous understory is totally dominated by cheatgrass which has a cover value of 23%. It actually accounts for 99% of the grass cover and 93% of the total herbaceous cover.

winter range condition (DCI) - very poor (13) Mid-level potential scale

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

2003 TREND ASSESSMENT

Trend for browse is down. The key browse species, mountain big sagebrush, has declined 53% in density to 740 plants/acre. The number of plants displaying poor vigor also increased from 18% in 1998 to 35%. No seedlings were encountered and young plants were rare. Cliffrose has also declined in density and increased in poor vigor and decadence. One positive aspect of the browse trend is the 99% decline in density of broom snakeweed (7,400 plants/acre to 60 plants/acre). The herbaceous understory is still very poor and totally dominated by cheatgrass and annual forbs. The trend for grasses is down. Only one perennial grass, galleta, was encountered on the site in 2003, and it occurred in only 2 quadrats. The trend for forbs is down. The forb composition is still very poor and dominated by annuals. The sum of nested frequency of perennial forbs decreased by 35% from 1998. The 13 species found in 2003 produced less than 2% total cover. The most common species were annuals, storksbill (*Erodium cicutarium*) and wooly plantain (*Plantago patagonica*).

winter range condition (DCI) - very poor (11) Mid-level potential scale

browse - down (-2) grass - down (-2) forb - down (-2)

2008 TREND ASSESSMENT

There was a fire in 2004 that changed the composition of the site by diminishing the browse species. Trend for browse is down, since the fire removed all of the mountain big sagebrush and diminished the Stansbury cliffrose density to just 20 plants/acre. The trend for both grasses and forbs are up. The sum of nested frequency of perennial grasses increased markedly with significant increases in the frequency of galleta and bottlebrush squirreltail from 2003. There was also a significant decrease from 2003 in the frequency of cheatgrass. The sum of nested frequency and cover of perennial forbs also increased dramatically. The perennial forbs gooseberry leaf globemallow (*Sphaeralcea grossulariifolia*) and Suksdorf's monkeyflower (*Mimulus suksdorfii*) were the dominant perennial forbs on the site.

winter range condition (DCI) - very poor (7) Mid-level potential scale

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

HERBACEOUS TRENDS --

Management unit 30 , Study no: 38

T y p e	Species					Average Cover %		
		'92	'98	'03	'08	'98	'03	'08
G	Agropyron cristatum	-	-	-	-	-	-	.01
G	Agropyron intermedium	-	-	-	1	-	-	.03
G	Agropyron sp.	9	-	-	-	-	-	-
G	Bouteloua gracilis	-	-	-	8	-	-	.10
G	Bromus rubens (a)	-	-	-	1	-	-	.01
G	Bromus tectorum (a)	-	c348	b306	a233	23.06	12.98	8.50
G	Hilaria jamesii	a-	a3	a7	b25	.06	.03	1.06
G	Oryzopsis hymenoides	-	2	-	-	.00	-	.00
G	Poa fendleriana	b13	a-	a-	a-	-	-	-
G	Poa secunda	b22	a-	a-	a3	-	-	.00
G	Sitanion hystrix	b12	b14	a-	b14	.11	-	.06
G	Vulpia octoflora (a)	-	ab17	a11	b23	.09	.05	.13
Total for Annual Grasses		0	365	317	257	23.15	13.04	8.64
Total for Perennial Grasses		56	19	7	51	0.18	0.03	1.27
Total for Grasses		56	384	324	308	23.34	13.07	9.91
F	Agoseris glauca	3	-	3	-	-	.04	-
F	Alyssum alyssoides (a)	-	2	-	-	.00	-	-
F	Boraginaceae	a-	a-	a-	b19	-	-	.55
F	Brodiaea pulchella	a-	a-	a-	b10	-	-	.02
F	Calochortus flexuosus	a9	ab9	bc31	c35	.05	.11	.18
F	Calochortus nuttallii	a-	a-	a-	b16	-	-	.09
F	Cymopterus sp.	-	-	1	1	-	.03	.03
F	Descurainia pinnata (a)	-	-	2	7	-	.01	.05
F	Draba sp. (a)	-	b28	a4	c60	.16	.01	.29
F	Erodium cicutarium (a)	-	38	38	31	.39	.82	2.00
F	Eriogonum sp.	-	-	-	2	-	-	.03
F	Eriogonum umbellatum	-	-	-	3	-	-	.15
F	Euphorbia sp.	-	-	-	13	-	-	.07
F	Gilia sp. (a)	-	-	22	23	-	.11	.11
F	Lappula occidentalis (a)	-	a-	c32	b12	-	.15	.05
F	Lactuca serriola	a-	a-	a-	b17	-	-	.56
F	Linum lewisii	-	-	-	2	-	-	.00
F	Lupinus argenteus	-	2	-	-	.04	-	-
F	Lupinus sp. (a)	-	-	-	4	-	-	.04

Type	Species					Average Cover %		
		'92	'98	'03	'08	'98	'03	'08
F	Malcolmia africana	-	-	-	2	-	-	.00
F	Mentzelia albicaulis (a)	-	-	-	3	-	-	.00
F	Medicago sativa	-	-	-	1	-	-	.00
F	Microsteris gracilis (a)	-	_b 65	_a 4	_a -	.30	.01	-
F	Mimulus suksdorfii	_a -	_a -	_a -	_b 194	-	-	4.19
F	Navarretia intertexta (a)	-	-	-	6	-	.00	.01
F	Phacelia fremontii	_a -	_a -	_a -	_b 13	-	-	1.37
F	Plantago patagonica (a)	-	30	27	27	.47	.32	.15
F	Salsola iberica (a)	-	_a -	_a -	_b 18	-	-	.38
F	Sisymbrium altissimum (a)	-	_a -	_a -	_b 15	-	-	.49
F	Sphaeralcea grossulariifolia	_a 8	_a -	_a -	_b 28	-	-	6.25
F	Thysanocarpus curvipes	-	2	-	-	.03	-	-
F	Unknown forb-annual (a)	-	2	6	-	.03	.04	-
F	Viguiera multiflora	-	-	3	-	-	.03	-
Total for Annual Forbs		0	165	135	206	1.37	1.48	3.59
Total for Perennial Forbs		20	13	38	356	0.12	0.21	13.54
Total for Forbs		20	178	173	562	1.50	1.69	17.14

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

BROWSE TRENDS --

Management unit 30 , Study no: 38

Type	Species	Strip Frequency			Average Cover %		
		'98	'03	'08	'98	'03	'08
B	Artemisia tridentata vaseyana	42	28	0	4.34	2.58	-
B	Cowania mexicana stansburiana	6	4	1	1.17	.93	.00
B	Ephedra viridis	21	23	0	4.46	4.88	-
B	Gutierrezia sarothrae	76	3	6	3.73	.06	.21
B	Juniperus osteosperma	5	4	0	9.19	9.00	.38
B	Kochia prostrata	0	0	7	-	-	.33
B	Prunus fasciculata	1	1	0	.15	.63	-
B	Yucca baccata	1	0	0	.00	-	-
Total for Browse		152	63	14	23.05	18.08	0.92

CANOPY COVER, LINE INTERCEPT --

Management unit 30 , Study no: 38

Species	Percent Cover		
	'98	'03	'08
Artemisia tridentata vaseyana	-	2.18	-
Cowania mexicana stansburiana	-	2.61	-
Ephedra viridis	-	6.55	-
Gutierrezia sarothrae	-	.01	.85
Juniperus osteosperma	16.79	18.13	3.79
Kochia prostrata	-	-	.26
Prunus fasciculata	-	.36	-

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 30 , Study no: 38

Species	Average leader growth (in)	
	'03	'08
Artemisia tridentata vaseyana	2.7	-

POINT-QUARTER TREE DATA --

Management unit 30 , Study no: 38

Species	Trees per Acre		
	'98	'03	'08
Juniperus osteosperma	34	34	18

Average diameter (in)		
'98	'03	'08
12.4	10.2	22.4

BASIC COVER --

Management unit 30 , Study no: 38

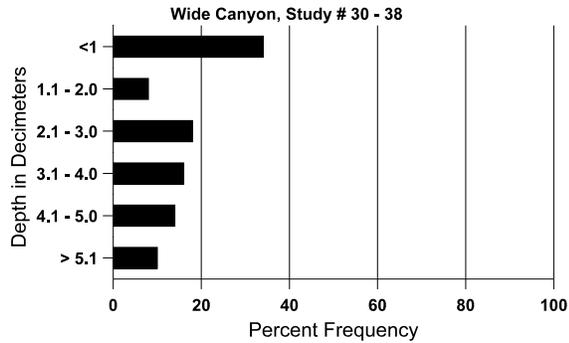
Cover Type	Average Cover %				
	'82	'92	'98	'03	'08
Vegetation	.75	.75	45.48	32.25	27.45
Rock	20.75	28.25	23.15	23.25	24.39
Pavement	11.25	10.75	6.17	3.37	5.74
Litter	55.00	41.00	44.79	43.21	35.23
Cryptogams	1.00	4.00	1.56	.17	.00
Bare Ground	11.25	15.25	14.72	14.47	21.97

SOIL ANALYSIS DATA --

Management unit 30, Study no: 38, Study Name: Wide Canyon

Effective rooting depth (in)	Temp °F (depth)	pH	loam			%OM	PPM P	PPM K	ds/m
			% sand	% silt	% clay				
16.6	49.0 (17.7)	6.5	40.0	33.4	26.6	1.4	11.1	150.4	0.6

Stoniness Index



PELLET GROUP DATA --

Management unit 30 , Study no: 38

Type	Quadrat Frequency		
	'98	'03	'08
Rabbit	12	24	80
Deer	45	32	56
Cattle	-	-	2

Days use per acre (ha)		
'98	'03	'08
-	-	-
121 (299)	64 (157)	45 (111)
2 (5)	11 (27)	4 (9)

BROWSE CHARACTERISTICS --
Management unit 30 , Study no: 38

		Age class distribution (plants per acre)					Utilization					
Y e a r	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Artemisia tridentata vaseyana</i>												
82	798	-	33	699	66	-	21	13	8	5	8	22/26
92	1598	299	733	566	299	-	69	13	19	-	6	19/23
98	1560	60	340	760	460	1240	23	3	29	18	18	17/24
03	740	-	60	280	400	1540	14	16	54	32	35	15/21
08	0	-	-	-	-	-	0	0	0	-	0	16/20
<i>Cowania mexicana stansburiana</i>												
82	466	-	-	466	-	-	57	14	0	-	0	32/31
92	464	133	199	99	166	-	21	29	36	-	7	33/29
98	120	100	20	100	-	-	33	33	0	-	0	85/85
03	80	-	-	40	40	-	50	25	50	-	0	82/82
08	20	-	20	-	-	-	100	0	0	-	0	22/14
<i>Ephedra viridis</i>												
82	199	-	-	199	-	-	0	0	0	-	0	24/26
92	298	-	99	199	-	-	33	0	0	-	0	24/36
98	480	-	20	440	20	20	13	8	4	4	4	34/40
03	500	-	40	400	60	20	4	0	12	4	4	33/44
08	0	-	-	-	-	-	0	0	0	-	0	28/29
<i>Gutierrezia sarothrae</i>												
82	3265	-	266	2833	166	-	0	0	5	3	5	8/9
92	3898	30033	466	3399	33	-	0	0	1	.51	3	13/12
98	7400	280	260	6880	260	280	0	0	4	2	2	8/10
03	60	-	-	60	-	340	0	0	0	-	0	14/18
08	160	40	-	160	-	-	0	0	0	-	0	12/19
<i>Juniperus osteosperma</i>												
82	33	-	33	-	-	-	0	0	-	-	0	-/-
92	33	66	33	-	-	-	0	0	-	-	0	-/-
98	140	-	40	100	-	-	0	0	-	-	0	-/-
03	100	-	20	80	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	-/-

		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)	
Kochia prostrata													
82	0	-	-	-	-	-	0	0	0	-	0	-/-	
92	0	-	-	-	-	-	0	0	0	-	0	-/-	
98	0	-	-	-	-	-	0	0	0	-	0	-/-	
03	0	-	-	-	-	-	0	0	0	-	0	-/-	
08	180	20	60	100	20	-	0	0	11	-	0	9/15	
Opuntia sp.													
82	0	-	-	-	-	-	0	0	-	-	0	-/-	
92	0	-	-	-	-	-	0	0	-	-	0	-/-	
98	0	-	-	-	-	-	0	0	-	-	0	-/-	
03	0	-	-	-	-	-	0	0	-	-	0	-/-	
08	0	-	-	-	-	-	0	0	-	-	0	12/30	
Prunus fasciculata													
82	0	-	-	-	-	-	0	0	-	-	0	-/-	
92	0	-	-	-	-	-	0	0	-	-	0	-/-	
98	20	-	-	20	-	-	0	0	-	-	0	25/59	
03	20	-	-	20	-	-	0	0	-	-	0	31/65	
08	0	-	-	-	-	-	0	0	-	-	0	-/-	
Yucca baccata													
82	0	-	-	-	-	-	0	0	-	-	0	-/-	
92	0	-	-	-	-	-	0	0	-	-	0	-/-	
98	20	-	-	20	-	-	0	0	-	-	0	33/45	
03	0	-	-	-	-	-	0	0	-	-	0	37/56	
08	0	-	-	-	-	-	0	0	-	-	0	-/-	