Trend Study 30-56-08

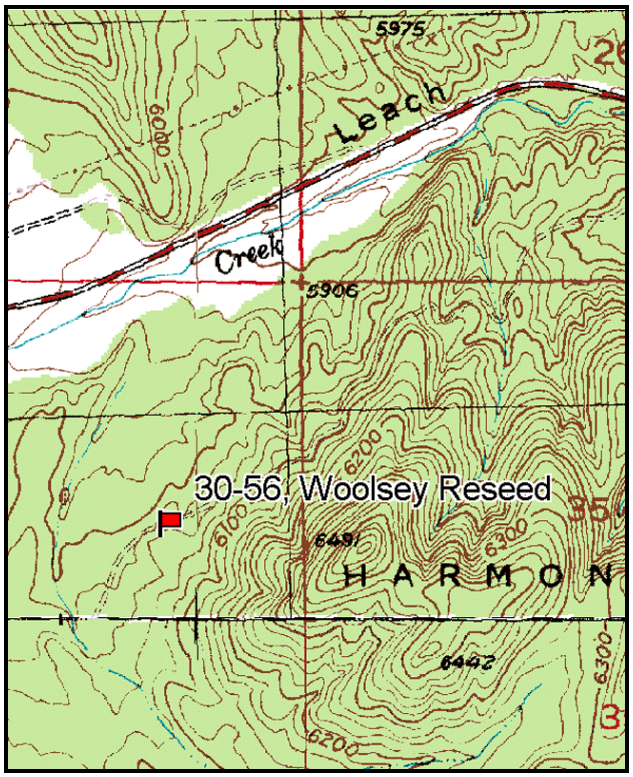
Study site name: Woolsey Reseed . Vegetation type: Chained, Seeded P-J .

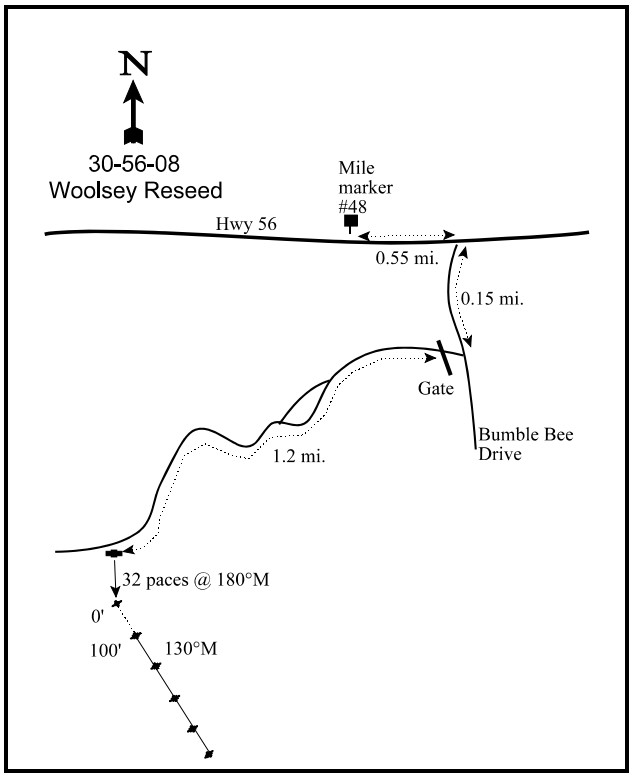
Compass bearing: frequency baseline 130 degrees magnetic.

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

LOCATION DESCRIPTION

From mile marker 48 on Highway 56 go east 0.55 miles to Bumblebee drive. Turn right (south) and travel 0.15 miles crossing a bridge to a right turn. Take this turn, go thru a gate, and proceed 1.2 miles to a witness post in a chaining. From the witness post the 0-foot stake is 32 paces directly south. The 0-foot stake is marked by browse tag # 95. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height.





Map Name: Desert Mound

Diagrammatic Sketch

Township 36S , Range 13W , Section 34

GPS: NAD 83, UTM 12S 297607 E, 4166888 N

DISCUSSION

Woolsey Seeding - Trend Study No. 30-56

Study Information

This trend study was established in 1998. It is located on the Woolsey seeding and samples a chained and seeded pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) site that is considered important deer winter range [elevation: 6,000 feet; slope: 10%-15%; northwest aspect]. The land is administered by the BLM and was treated by lop and scatter between 2003 and 2008. Deer are thought to concentrate on the chaining during the winter and cattle also graze the area during the spring and summer. Pellet group data estimated 37 deer days use/acre in 1998 and 44 in 2003 (91 and 109 ddu/ha, respectively). Cattle use was estimated at 55 cow days use/acre in 1998 and 26 in 2003 (136 and 65cdu/ha, respectively). Pellet data from 2008 estimated 3 elk days use/acre (8 edu/ha), 41 deer days use/acre (101 ddu/ha), 9 cow days use/acre (22 cdu/ha), and 3 sheep days use/acre (8 sdu/ha). Escape cover for deer is abundant in the form of large serviceberry on the site and unchained pinyon and juniper trees about 500 feet to the east.

Soil

Soil on the site is moderately deep, and rocky on the surface and through the profile. Effective rooting depth is estimated at 16 inches. Soil texture is a clay loam which is neutral in reaction (pH 7.0). Phosphorus is low at only 6.1 ppm and may limit plant growth and development (Tiedemann and Lopez 2004). Erosion is not a problem on the site due to the abundant protective ground cover consisting primarily of herbaceous vegetation and old chaining litter. The soil erosion condition was classified as stable in 2003 and 2008.

Browse

The site supports low densities of several preferred browse species including Utah serviceberry (*Amelanchier utahensis*), mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), dwarf rabbitbrush (*Chrysothamnus depressus*), rubber rabbitbrush (*Chrysothamnus nauseosus* ssp. *hololeucus*), cliffrose (*Cowania mexicana* ssp. *stansburiana*), antelope bitterbrush (*Purshia tridentata*), and curlleaf and true mountain mahogany (*Cercocarpus ledifolius* and *C. montanus*). The most abundant of these is rubber rabbitbrush which numbered about 300 plants/acre in 1998 and 2003 then declined to 200 plants/acre in 2008. Most of the other preferred shrubs were not adequately sampled because they occur in such limited numbers. Cliffrose and bitterbrush were heavily hedged with serviceberry moderately utilized during both readings. True mountain mahogany and curlleaf mountain mahogany were also heavily hedged during both readings. Young pinyon and juniper trees were released by the chaining. These are young trees in the 4 to 6 foot class, not killed by the chaining. They were fairly abundant. Point-quarter data from 2003 estimated 63 Utah juniper and 41 pinyon trees/acre while in 2008 only 20 juniper and 18 pinyon trees occurred per acre after the lop and scatter treatment. Pinyon and juniper provided nearly 4% cover which accounted for 53% of the shrub cover in 1998, and a line-intercept canopy cover of 6% for juniper and 1.25% for pinyon, over a twofold increase since 1998. After the treatment in 2008, pinyon and juniper provided no quadrat or line-intercept cover.

Herbaceous Understory

Seeded grasses dominate the site. Crested wheatgrass (*Agropyron cristatum*), intermediate wheatgrass (*Agropyron intermedium*), and Russian wildrye (*Elymus junceus*) are abundant and provided 96% of grass cover in 1998, 99% in 2003, and 98% in 2008. Three native perennial grasses are also present in small numbers as is the annual cheatgrass (*Bromus tectorum*). The forb component is diverse with 15 and 17 species

encountered in 1998 and 2003, respectively. However, all species occur rarely and all perennial forbs combined produced less than 1% cover during all readings.

1998 DESIRABLE COMPONENTS INDEX

winter range condition (DCI) - very poor-poor (33) mid-level potential scale

2003 TREND ASSESSMENT

Trend for browse is stable although the browse component is limited, browse accounts for 16% of vegetation cover. There are several preferred species which occur in very small numbers and are heavily hedged. All species, serviceberry, mountain big sagebrush, curlleaf mahogany, rubber rabbitbrush, cliffrose, and bitterbrush, displayed normal vigor even with the heavy use. Trend for the herbaceous understory is down. Sum of nested frequency for perennial grasses declined by 37% since 1998. There was some difficulty differentiating crested and intermediate wheatgrass in 2003 due to late flowering. However, the combined nested frequency value for these grasses declined 34%. Nested frequency of the only other seeded grass, Russian wildrye, also declined significantly. Average cover of perennial grasses declined more than two-fold from 27% to 11%. Forbs remain diverse but all species are rare in their occurrence. Nested frequency of perennial forbs also declined although total cover of forbs remained similar to 1998 levels due to an increase in annual forb cover.

winter range condition (DCI) - very poor (26) mid-level potential scale

browse - stable (0) grass - down (-2) forb - stable (0)

2008 TREND ASSESSMENT

Browse trend is stable. Serviceberry density has increased 50% to 60 plants/acre with no decadence, and recruitment of young plants is good at 33% of the population. Mountain big sagebrush density is constant at 20 plants/acre. Low rabbitbrush is on a downward trend as density has decreased 60% to 40 plants/acre since 2003 and no recruitment was noted. Trend for the grasses is up. The herbaceous understory has improved greatly due to a three-fold increase in perennial grass cover to 39%, and a 22% increase in the sum of nested frequency. Cheatgrass is increasing on the site, but still accounts for less than 1% of cover. The trend for forbs is stable, but forbs are rare on the site. The sum of nested frequency of perennial forbs is similar to 2003, though cover of perennial forbs has decreased to less than 0.5%.

winter range condition (DCI) - very poor (32) mid-level potential scale

browse - stable (0) grass - up (+2) forb - stable (0)

HERBACEOUS TRENDS --
Management unit 30 , Study no: 56

Type	Species	Nested Frequency			Average Cover %		
		'98	'03	'08	'98	'03	'08
G	Agropyron cristatum	$_{ab}$190	$_{b}$262	$_{a}$186	8.09	8.57	16.59
G	Agropyron intermedium	$_{b}$287	$_{a}$54	$_{a}$51	13.56	1.39	2.34
G	Bromus inermis	-	-	1	-	-	.00
G	Bromus tectorum (a)	$_{b}$75	$_{a}$14	$_{b}$85	.75	.04	.34
G	Elymus junceus	$_{b}$110	$_{a}$57	$_{c}$204	4.10	1.38	19.44
G	Oryzopsis hymenoides	-	-	6	.03	.00	.15
G	Poa secunda	4	2	2	.01	.03	.00
G	Sitanion hystrix	$_{ab}$3	$_{a}$-	$_{b}$7	.15	-	.36
Total for Annual Grasses		75	14	85	0.75	0.04	0.34
Total for Perennial Grasses		594	375	457	25.96	11.39	38.92
Total for Grasses		669	389	542	26.71	11.43	39.26
F	Astragalus sp.	5	1	6	.09	.00	.03
F	Collinsia parviflora (a)	-	-	2	-	-	.00
F	Cryptantha sp.	$_{a}$-	$_{ab}$4	$_{b}$10	-	.03	.05
F	Cymopterus sp.	7	8	-	.09	.04	-
F	Dalea flavescens	5	-	2	.30	-	.00
F	Descurainia pinnata (a)	$_{a}$5	$_{b}$22	$_{a}$-	.01	.14	-
F	Draba sp. (a)	$_{b}$11	$_{c}$27	$_{a}$-	.03	.16	-
F	Eriogonum shockleyi	-	-	-	-	-	.00
F	Eriogonum umbellatum	3	2	-	.03	.03	-
F	Lappula occidentalis (a)	3	15	3	.01	.20	.01
F	Lesquerella sp.	4	3	6	.07	.01	.01
F	Lotus utahensis	2	-	2	.03	-	.00
F	Lupinus argenteus	3	-	-	.00	-	-
F	Microsteris gracilis (a)	$_{b}$21	$_{ab}$8	$_{a}$3	.05	.02	.01
F	Pedicularis centranthera	-	6	5	-	.44	.18
F	Penstemon sp.	4	4	2	.00	.01	.00
F	Petradoria pumila	9	4	-	.18	.01	.00
F	Phlox hoodii	5	4	1	.04	.01	.00
F	Phlox longifolia	-	1	-	-	.00	-
F	Polygonum douglasii (a)	-	6	9	-	.01	.02
F	Ranunculus testiculatus (a)	-	1	35	-	.00	.10
F	Streptanthus cordatus	2	13	8	.01	.03	.04
Total for Annual Forbs		40	79	52	0.10	0.54	0.14

Type	Species	Nested Frequency			Average Cover %		
		'98	'03	'08	'98	'03	'08
Total for Perennial Forbs		49	50	42	0.85	0.64	0.34
Total for Forbs		89	129	94	0.96	1.19	0.49

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

BROWSE TRENDS --
Management unit 30 , Study no: 56

Type	Species	Strip Frequency			Average Cover %		
		'98	'03	'08	'98	'03	'08
B	Amelanchier utahensis	2	1	2	.85	.98	.98
B	Artemisia tridentata vaseyana	1	1	1	.00	.00	.03
B	Cercocarpus montanus	1	1	1	.00	.00	.00
B	Chrysothamnus depressus	18	4	2	.55	.00	.03
B	Chrysothamnus nauseosus hololeucus	8	6	7	1.56	.45	.64
B	Chrysothamnus viscidiflorus	0	0	0	-	-	.15
B	Cowania mexicana stansburiana	0	3	2	-	.00	.15
B	Eriogonum microthecum	3	3	10	.03	.01	.04
B	Gutierrezia sarothrae	20	20	41	.45	.26	.81
B	Juniperus osteosperma	4	4	0	1.94	5.10	.00
B	Opuntia sp.	0	1	0	-	.00	-
B	Pinus edulis	3	1	0	1.97	.18	-
B	Purshia tridentata	0	0	0	.03	-	-
B	Ribes sp.	1	0	0	.00	-	-
Total for Browse		61	45	66	7.40	6.98	2.83

CANOPY COVER, LINE INTERCEPT --
Management unit 30 , Study no: 56

Species	Percent Cover		
	'98	'03	'08
Amelanchier utahensis	-	.81	.98
Artemisia tridentata vaseyana	-	-	.11
Chrysothamnus nauseosus hololeucus	-	.16	-
Cowania mexicana stansburiana	-	.08	.20
Gutierrezia sarothrae	-	.50	.68
Juniperus osteosperma	.60	6.15	-
Pinus edulis	2.20	1.26	-

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 30 , Study no: 56

Species	Average leader growth (in)	
	'03	'08
Amelanchier utahensis	1.6	1.4
Cowania mexicana stansburiana	1.8	0.5
Purshia tridentata	0.9	0.9

POINT-QUARTER TREE DATA --
Management unit 30 , Study no: 56

Species	Trees per Acre		
	'98	'03	'08
Juniperus osteosperma	59	63	20
Pinus edulis	28	41	18

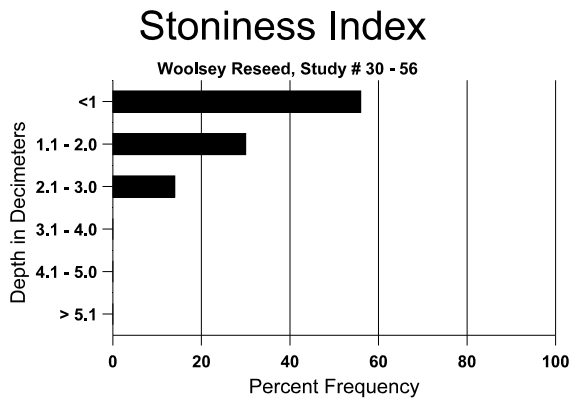
Average diameter (in)		
'98	'03	'08
2.0	3.4	1.8
2.0	2.3	-

BASIC COVER --
Management unit 30 , Study no: 56

Cover Type	Average Cover %		
	'98	'03	'08
Vegetation	39.56	20.13	42.75
Rock	5.94	8.19	5.01
Pavement	9.63	19.89	15.67
Litter	52.22	47.84	46.15
Cryptogams	.24	.04	.43
Bare Ground	18.28	10.11	7.16

SOIL ANALYSIS DATA --
Management unit 30, Study no: 56, Study Name: Woolsey Reseed

Effective rooting depth (in)	Temp °F (depth)	pH	clay loam			%0M	PPM P	PPM K	ds/m
			%sand	%silt	%clay				
16.1	51.6 (16.3)	7.0	38.0	25.4	36.6	3.5	6.1	118.4	0.7



PELLET GROUP DATA --
Management unit 30 , Study no: 56

Type	Quadrat Frequency			Days use per acre (ha)		
	'98	'03	'08	'98	'03	'08
Sheep	-	-	1	-	-	3 (8.3)
Rabbit	25	23	90	-	-	-
Deer	24	30	39	36 (89)	44 (109)	41 (101)
Cattle	11	8	4	54 (133)	26 (64)	9 (22)

BROWSE CHARACTERISTICS --
Management unit 30 , Study no: 56

		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)
Amelanchier utahensis												
98	**40**	-	-	40	-	-	100	0	-	-	0	37/51
03	**40**	20	20	20	-	-	50	0	-	-	0	58/70
08	**60**	60	20	40	-	-	33	33	-	-	0	72/93
Artemisia tridentata vaseyana												
98	**20**	-	20	-	-	-	0	0	-	-	0	-/-
03	**20**	-	-	20	-	-	0	100	-	-	0	8/-
08	**20**	80	-	20	-	20	0	0	-	-	0	14/15
Cercocarpus ledifolius												
98	**0**	-	-	-	-	-	0	0	-	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	-	0	35/47
08	**0**	-	-	-	-	-	0	0	-	-	0	34/53
Cercocarpus montanus												
98	**20**	-	-	20	-	-	0	100	0	-	0	50/54
03	**20**	-	-	-	20	-	0	100	100	-	0	64/60
08	**20**	-	-	-	20	-	0	100	100	100	100	38/44
Chrysothamnus depressus												
98	**620**	20	100	520	-	-	0	0	-	-	0	4/6
03	**100**	-	20	80	-	-	0	0	-	-	0	3/5
08	**40**	-	-	40	-	-	0	0	-	-	0	-/-
Chrysothamnus nauseosus hololeucus												
98	**300**	-	40	180	80	-	40	0	27	13	13	34/43
03	**320**	-	-	300	20	60	6	0	6	-	0	30/38
08	**200**	-	40	100	60	80	30	20	30	30	30	30/32
Chrysothamnus viscidiflorus												
98	**0**	-	-	-	-	-	0	0	-	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	-	0	-/-
08	**0**	-	-	-	-	-	0	0	-	-	0	9/14
Cowania mexicana stansburiana												
98	**0**	-	-	-	-	20	0	0	0	-	0	62/66
03	**60**	-	-	40	20	-	0	33	33	-	0	54/56
08	**40**	-	20	20	-	-	0	50	0	-	0	73/58

		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)
Eriogonum microthecum												
98	**60**	-	20	40	-	-	0	0	0	-	0	4/11
03	**80**	-	-	60	20	-	100	0	25	-	0	1/2
08	**220**	40	-	220	-	-	18	0	0	-	0	3/4
Gutierrezia sarothrae												
98	**1180**	80	60	1120	-	20	0	0	0	-	0	7/10
03	**1260**	640	40	1180	40	40	0	0	3	2	2	5/6
08	**1920**	2020	220	1060	640	100	1	2	33	8	8	6/9
Juniperus osteosperma												
98	**100**	40	40	60	-	60	0	0	-	-	0	-/-
03	**100**	-	-	100	-	-	0	0	-	-	0	-/-
08	**0**	60	-	-	-	20	0	0	-	-	0	-/-
Opuntia sp.												
98	**0**	-	-	-	-	-	0	0	-	-	0	-/-
03	**20**	-	-	20	-	-	0	0	-	-	0	3/5
08	**0**	-	-	-	-	-	0	0	-	-	0	4/5
Pediocactus simpsonii												
98	**0**	-	-	-	-	-	0	0	-	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	-	0	-/-
08	**0**	-	-	-	-	-	0	0	-	-	0	3/5
Pinus edulis												
98	**60**	-	40	20	-	20	0	0	-	-	0	-/-
03	**20**	-	-	20	-	-	0	0	-	-	0	-/-
08	**0**	-	-	-	-	20	0	0	-	-	0	-/-
Purshia tridentata												
98	**0**	-	-	-	-	-	0	0	-	-	0	33/70
03	**0**	-	-	-	-	20	0	0	-	-	0	27/37
08	**0**	-	-	-	-	-	0	0	-	-	0	27/34
Ribes sp.												
98	**80**	-	-	80	-	-	0	0	-	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	-	0	-/-
08	**0**	-	-	-	-	-	0	0	-	-	0	-/-
Sclerocactus sp.												
98	**0**	-	-	-	-	-	0	0	-	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	-	0	3/7
08	**0**	-	-	-	-	-	0	0	-	-	0	-/-