

Trend Study 22-9-08

Study site name: Rocks Reseeding .

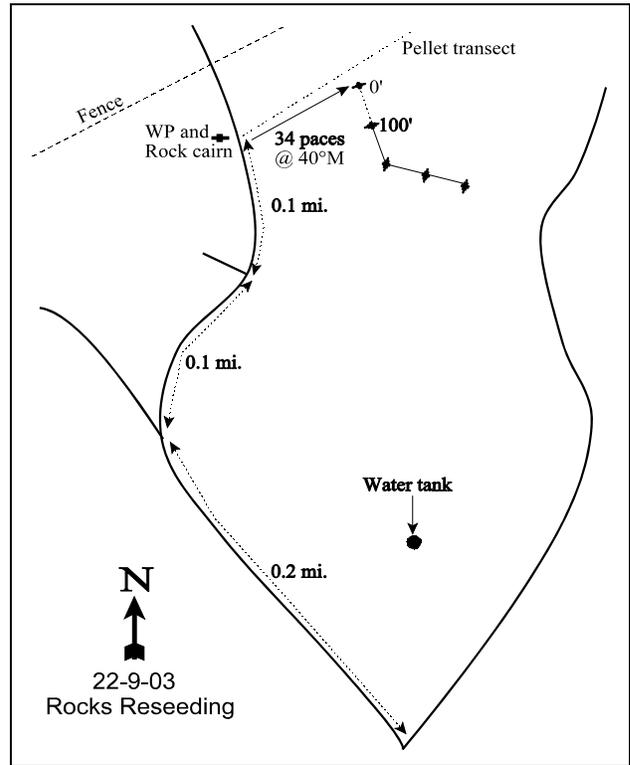
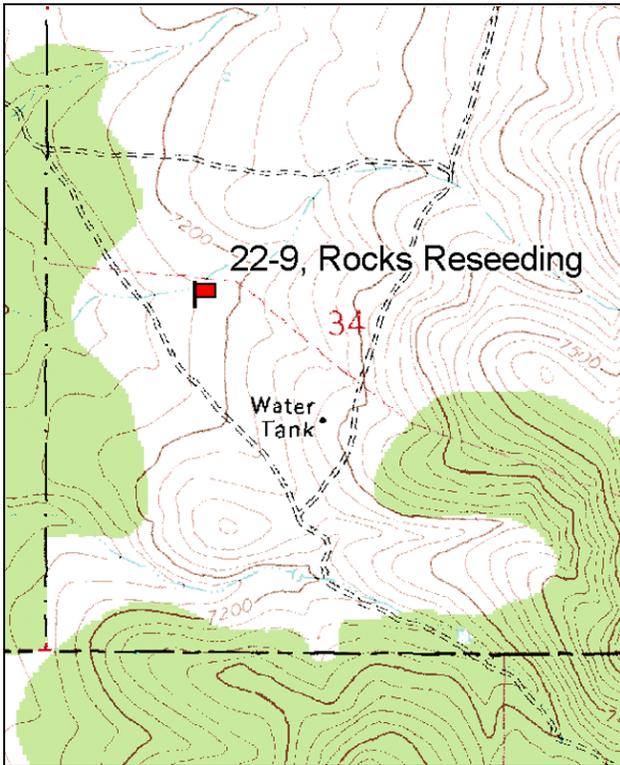
Vegetation type: Chained, Seeded P-J .

Compass bearing: frequency baseline 163 degrees magnetic. Lines 3-4 116° M.

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

LOCATION DESCRIPTION

Begin on I-15 at exit #100, 9 miles south of Beaver. On the east side of the freeway there is a frontage road and a road going east. Go east 6.3 miles up Fremont Wash to a faint road to the left. Go 0.6 miles up the road which has several switchbacks to the top to a gate. Continue straight for 0.7 miles to a four-way intersection. Go straight 0.65 miles to a fork. Take the middle fork for 0.8 miles to a fork with 1002 and 1003. Go right for 1 mile on 1002 to a stock pond. Go up a steep hill 0.1 miles to a fork, turn left (1005), and go 0.2 miles to another fork. Stay right and go another 0.1 mile to a witness post on the left side of the road. The witness post marks the start of a pellet group transect. From the witness post, walk 34 paces at 41 degrees magnetic along the transect. There are small rebar every 30 feet. The baseline starts 10 feet south of the fifth small rebar (150 feet from the fencepost). The frequency baseline is marked by 2-3 foot rebar and the 0-foot stake is tagged #7050. The 200, 300 and 400 foot stakes are half-high fenceposts.



Map Name: Kane Canyon

Diagrammatic Sketch

Township 30S , Range 6W , Section 34

GPS: NAD 83, UTM 12S 366401 E, 4224124 N

DISCUSSION

Rocks Reseeding - Trend Study No. 22-9

Study Information

This study is located on USFS administered land [elevation: 7,200 feet (2,195m), slope: 4-6%, aspect: west]. The area was Dixie harrowed in 1962, followed by large areas being seeded with mostly crested wheatgrass (*Agropyron cristatum*). There were numerous water developments and fencing projects completed. A water trough is located about one third of a mile from the site. There is a healthy stand of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and antelope bitterbrush (*Purshia tridentata*) with a low density of Utah juniper (*Juniperus osteosperma*) scattered throughout the community. In 1998, a pellet group data estimated light use at 18 deer days use/acre (44 ddu/ha) and 20 cow days use/acre (49 cdu/ha). The transect data in 2003 estimated 23 deer, 6 elk, and 19 cow days use/acre (56 ddu/ha, 15 edu/ha, and 47 cdu/ha). The pellet group transect in 2008 estimated 19 deer and 32 cow days use/acre (48 ddu/ha and 79 cdu/ha). This transect lies in the Circleville cattle allotment which is on a 3 year rest rotation system.

Soil

The soil is classified within the Pahvant series (USDA-NRCS 2007) which consists of well drained soils that are shallow to a carbonate cemented hardpan. They occur on alluvial fans and rolling hills. Soil analysis indicates texture to be a clay loam with a neutral pH (6.6). Soils have moderate depth with an average effective rooting depth estimated at 13 inches. Rock and pavement cover are moderate on the soil surface and appear to be from basaltic parent material. An erosion condition class assessment rated soils as stable in 2003 and as having slight erosion in 2008. The variation in litter cover appears to be correlated to the amount of associated crested wheatgrass cover.

Browse

The browse component is a mixture of mountain big sagebrush and antelope bitterbrush. Bitterbrush is the most preferred browse species. Utilization has been classified through the years as mostly moderate to heavy use. Density of bitterbrush numbered 1,440 plants/acre in 1998 and 1,140 plants/acre in 2008, which is a decrease of 21%. Since 1998 recruitment of young has averaged only 6%. Decadence has varied widely since 1985 with the lowest decadence (9%) and 2003 when it was the highest at 59%. Bitterbrush cover has averaged about 11% in 2003 and 2008 with the line intercept method.

Mountain big sagebrush density was estimated at 3,420 plants/acre in 1998 and 3,140 plants/acre in 2008, which is decrease of 8%. The main difference in density between 1998 and 2008 was a decline in the number of young and mature plants and larger increase in decadent plants. On average, recruitment since 1998 has been 17%. This would indicate that if these conditions continue, the density of mountain big sagebrush will continue to go down. Utilization has been mostly light to moderate in all surveys. Decadence has steadily increased since 1998 (8%, 17% and 46%). Sagebrush cover also declined between 1998 and 2008.

Utah juniper density has increased from 1998 to 2008 (54 trees/acre in 2003, 60 trees/acre in 2003, and 65 trees/acre in 2008).

Herbaceous Understory

Crested wheatgrass is by far the dominant herbaceous species on the site for all readings. Crested wheatgrass provided nearly 100% of the grass cover in 1998, 2003 and 2008. It was found in at least 88% of the quadrats for all years it was sampled. Other perennial grasses sampled on the site included bluebunch wheatgrass (*Agropyron spicatum*), mutton bluegrass (*Poa fendleriana*), galleta (*Hilaria jamesii*), and prairie junegrass (*Koeleria cristata*). All of these species occur in very low numbers. Perennial forbs have been sparse in all years. Annual forbs increased in 2003, but almost disappeared in 2008. Perennial forbs have remained fairly stable through the years, but are very sparse. Longleaf phlox (*Phlox longifolia*) was the most common

perennial forb in all surveys.

1991 TREND ASSESSMENT

Trend for browse is mixed as mountain big sagebrush increased and bitterbrush decreased. Another critical parameter is that percent decadence for bitterbrush has risen from 9% to 56%. Trend for browse is stable. Trend for the perennial grasses is slightly down The trend for forbs is slightly down and have never been very abundant on this site.

browse - stable (0) grass - slightly down (-1) forb - slightly down (-1)

1998 TREND ASSESSMENT

The browse trend is slightly upward with a decrease in percent decadence and an increase in the percentage of plants with good vigor for both key browse species. The bitterbrush population is recovering from high percent decadence in 1991 and appears to be healthy. The perennial grass trend is stable with a slight decrease in grass sum of nested frequency. The trend for perennial forb trend is considered stable with a slight increase in nested frequency, yet they still are an insignificant as a source of forage.

Winter Range Condition (DCI) - excellent (83) mid-level potential scale
browse - slightly up (+1) grass - stable (0) forb - stable (0)

2003 TREND ASSESSMENT

Trend for the browse component is slightly down. Mountain big sagebrush and bitterbrush both show losses in density and much less recruitment of young into their populations. Both species have increased decadence, with a high increase for bitterbrush. Both species have maintained generally good vigor, although 76% of the bitterbrush sampled displayed heavy use. Trend for the perennial grasses is slightly down with sum of nested frequency down by almost 15%. The trend for perennial forbs is stable with sum of nested frequency almost the same. The perennial forbs are still an insignificant source of forage for this site.

Winter Range Condition (DCI) - good (70) mid-level potential scale
browse - slightly down (-1) grass - slightly down (-1) forb - stable (0)

2008 TREND ASSESSMENT

Trend for the browse component is slightly down. Sagebrush decadence in much higher (46%) and sagebrush cover has decreased. Bitterbrush also showed a slight increase in density, however, this is countered by low recruitment and decadence still remains more than 50%. Trend for the perennial grasses is stable as sum of nested frequency is nearly unchanged. Crested wheatgrass still contributes to more than 98% of the perennial grass cover. With this dominance, cheatgrass is of little concern on this site with this kind of herbaceous competition. The trend for perennial forbs continues to be stable and remains an insignificant source of forage for this site.

Winter Range Condition (DCI) - fair (53) mid-level potential scale
browse - slightly down (-1) grass - stable (0) forb - stable (0)

HERBACEOUS TRENDS --
Management unit 22 , Study no: 9

T y p e	Species	Nested Frequency					Average Cover %		
		'85	'91	'98	'03	'08	'98	'03	'08
G	Agropyron cristatum	ab294	a258	b301	ab265	a260	22.16	15.03	18.07
G	Agropyron spicatum	b77	b60	a9	a3	a-	.56	.02	-
G	Aristida purpurea	-	-	2	1	-	.03	.03	-
G	Bromus tectorum (a)	-	-	-	1	1	-	.00	.00
G	Hilaria jamesii	-	-	3	-	3	.03	-	.15
G	Koeleria cristata	a4	b8	a-	a4	a-	-	.01	-
G	Oryzopsis hymenoides	4	-	1	1	3	.03	.03	.01
G	Poa fendleriana	c51	b20	a3	a1	a-	.15	.00	-
G	Poa secunda	-	-	-	3	5	-	.09	.04
Total for Annual Grasses		0	0	0	1	1	0	0.00	0.00
Total for Perennial Grasses		430	346	319	278	271	22.96	15.22	18.27
Total for Grasses		430	346	319	279	272	22.96	15.22	18.28
F	Agoseris glauca	-	-	1	1	-	.03	.00	-
F	Alyssum alyssoides (a)	-	-	-	2	6	-	.00	.01
F	Arabis demissa	b8	a-	a3	a3	a-	.00	.03	-
F	Astragalus convallarius	2	-	3	-	-	.15	-	-
F	Astragalus sp.	1	-	6	5	5	.33	.01	.03
F	Castilleja chromosa	3	-	-	-	-	-	-	-
F	Calochortus nuttallii	-	-	-	3	-	-	.00	-
F	Chaenactis douglasii	3	-	-	1	-	-	.00	-
F	Collinsia parviflora (a)	-	-	a1	ab19	b24	.00	.04	.06
F	Crepis acuminata	-	-	-	1	3	-	.03	.01
F	Cryptantha sp.	-	-	-	1	-	-	.00	-
F	Cymopterus sp.	a-	a-	a2	b11	a9	.01	.03	.04
F	Delphinium nuttallianum	-	-	5	6	-	.04	.01	.00
F	Descurainia pinnata (a)	-	-	2	-	-	.00	-	-
F	Draba sp. (a)	-	-	2	2	-	.00	.00	-
F	Erigeron eatonii	-	-	-	-	3	-	-	.00
F	Erigeron sp.	4	-	-	-	-	-	-	-
F	Eriogonum racemosum	-	-	2	-	1	.03	-	.00
F	Gayophytum ramosissimum(a)	-	-	-	5	3	-	.01	.00
F	Lactuca serriola	-	-	1	-	-	.00	-	-
F	Lomatium sp.	a2	a1	a4	a-	b8	.01	-	.05
F	Microsteris gracilis (a)	-	-	a9	b166	a3	.02	1.63	.00

T y p e	Species	Nested Frequency					Average Cover %		
		'85	'91	'98	'03	'08	'98	'03	'08
F	Navarretia intertexta (a)	-	-	-	1	-	-	.00	-
F	Phlox longifolia	51	37	32	30	33	.18	.11	.09
F	Ranunculus testiculatus (a)	-	-	a-	ab ⁸	b ⁷	-	.01	.02
F	Trifolium sp.	3	-	-	1	-	-	.00	-
F	Vicia americana	-	-	3	-	-	.03	-	-
F	Zigadenus paniculatus	-	-	3	-	1	.00	-	.03
Total for Annual Forbs		0	0	14	203	43	0.03	1.71	0.11
Total for Perennial Forbs		77	38	65	63	63	0.84	0.27	0.26
Total for Forbs		77	38	79	266	106	0.88	1.99	0.38

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

BROWSE TRENDS --

Management unit 22 , Study no: 9

T y p e	Species	Strip Frequency			Average Cover %		
		'98	'03	'08	'98	'03	'08
B	Artemisia tridentata vaseyana	84	74	79	14.66	12.76	6.44
B	Juniperus osteosperma	5	5	5	.15	.48	1.49
B	Opuntia sp.	0	0	1	-	-	-
B	Pinus edulis	1	1	0	-	.15	-
B	Purshia tridentata	48	42	44	12.26	9.76	6.33
Total for Browse		138	122	129	27.07	23.15	14.26

CANOPY COVER, LINE INTERCEPT --

Management unit 22 , Study no: 9

Species	Percent Cover		
	'98	'03	'08
Artemisia tridentata vaseyana	-	13.66	9.44
Juniperus osteosperma	.60	2.04	3.86
Pinus edulis	-	.16	-
Purshia tridentata	-	10.83	10.83

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 22 , Study no: 9

Species	Average leader growth (in)	
	'03	'08
Artemisia tridentata vaseyana	1.6	1.2
Purshia tridentata	2.2	0.7

POINT-QUARTER TREE DATA --

Management unit 22 , Study no: 9

Species	Trees per Acre		
	'98	'03	'08
Juniperus osteosperma	54	60	65

Average diameter (in)		
'98	'03	'08
4.8	4.6	5.5

BASIC COVER --

Management unit 22 , Study no: 9

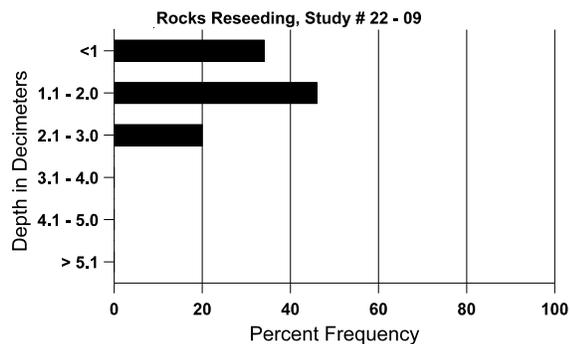
Cover Type	Average Cover %				
	'85	'91	'98	'03	'08
Vegetation	10.25	8.25	39.93	40.48	36.45
Rock	12.50	11.75	11.52	10.52	9.96
Pavement	14.00	6.75	11.13	9.10	14.43
Litter	50.00	45.50	42.81	27.09	35.18
Cryptogams	0	1.00	.45	.15	.40
Bare Ground	13.25	26.75	21.22	30.40	21.18

SOIL ANALYSIS DATA --

Management unit 22, Study no: 9, Study Name: Rocks Reseeding

Effective rooting depth (in)	Temp °F (depth)	pH	clay loam			%0M	PPM P	PPM K	ds/m
			%sand	%silt	%clay				
13.1	41.6 (15.2)	6.6	38.0	31.4	30.6	2.5	9.8	185.6	0.7

Stoniness Index



PELLET GROUP DATA --

Management unit 22 , Study no: 9

Type	Quadrat Frequency		
	'98	'03	'08
Rabbit	23	4	80
Elk	2	-	2
Deer	21	7	16
Cattle	18	9	7

Days use per acre (ha)		
'98	'03	'08
-	-	-
1 (2)	6 (15)	-
18 (45)	23 (56)	19 (48)
20 (49)	19 (47)	32 (79)

BROWSE CHARACTERISTICS --

Management unit 22 , Study no: 9

		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>Artemisia tridentata vaseyana</i>												
85	1931	2733	199	1199	533	-	48	3	28	-	0	28/27
91	2198	1533	466	999	733	-	36	6	33	4	15	25/31
98	3420	340	900	2240	280	460	18	1	8	1	2	27/37
03	2880	20	340	2040	500	240	21	8	17	3	3	25/31
08	3140	60	420	1280	1440	520	37	14	46	27	31	19/29
<i>Chrysothamnus viscidiflorus stenophyllus</i>												
85	66	-	66	-	-	-	0	0	0	-	0	-/-
91	265	199	199	-	66	-	50	25	25	-	0	-/-
98	0	-	-	-	-	-	0	0	0	-	0	-/-
03	0	-	-	-	-	-	0	0	0	-	0	-/-
08	0	-	-	-	-	-	0	0	0	-	0	-/-
<i>Juniperus osteosperma</i>												
85	66	-	66	-	-	-	0	0	-	-	0	-/-
91	133	-	133	-	-	-	0	0	-	-	0	-/-
98	100	20	60	40	-	-	0	0	-	-	0	-/-
03	100	-	40	60	-	-	0	0	-	-	0	-/-
08	100	20	60	40	-	-	0	20	-	-	20	-/-
<i>Opuntia sp.</i>												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	20	-	-	20	-	-	0	0	-	-	0	4/2

		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)
Opuntia whipplei												
85	66	-	66	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	6/8
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	-/-
Pinus edulis												
85	66	-	66	-	-	-	0	0	-	-	0	-/-
91	66	-	66	-	-	-	0	0	-	-	0	-/-
98	20	-	20	-	-	-	0	0	-	-	0	-/-
03	20	-	20	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	-/-
Purshia tridentata												
85	1465	1199	466	866	133	-	23	59	9	-	0	35/28
91	1198	266	199	333	666	-	33	56	56	3	11	26/30
98	1440	100	100	1200	140	100	57	3	10	-	0	41/53
03	1080	20	60	380	640	40	22	76	59	13	13	38/47
08	1140	100	60	480	600	80	42	37	53	19	19	42/51