

Trend Study 25A-11-04

Study site name: Forsyth Reservoir .

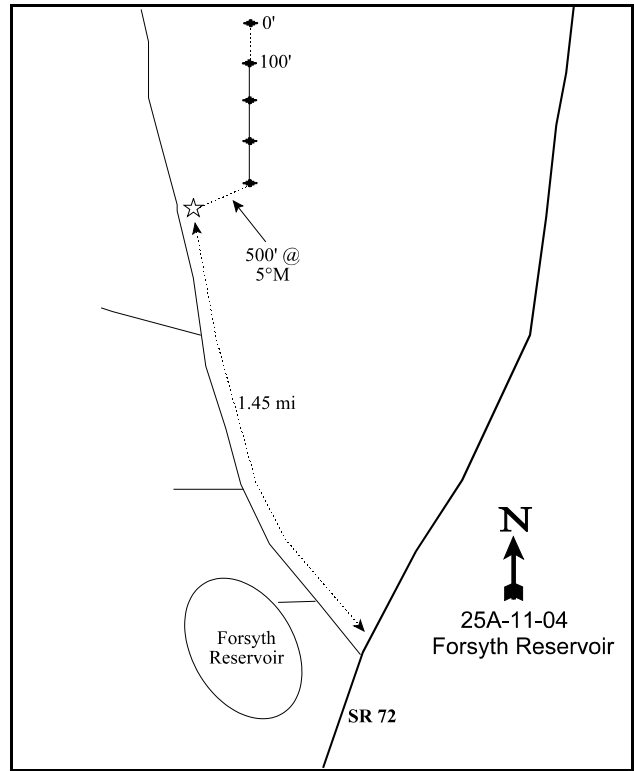
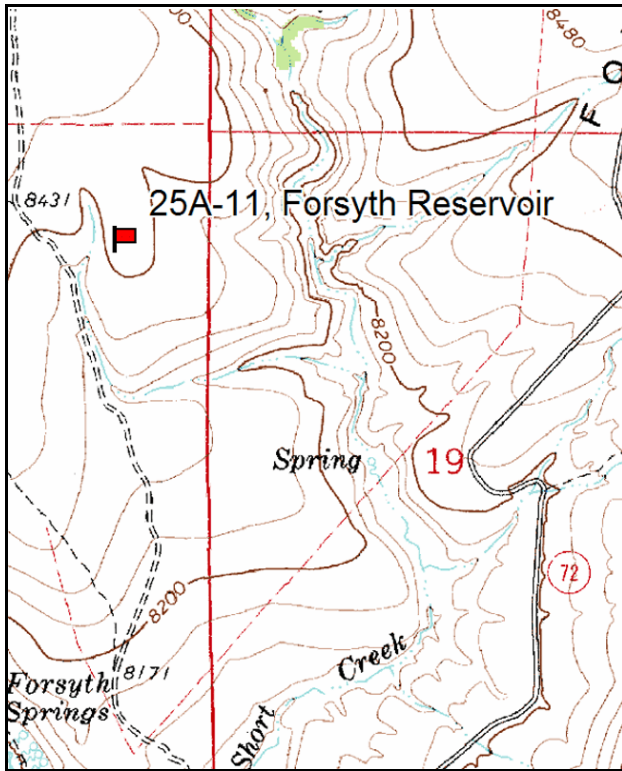
Vegetation type: Black Sagebrush .

Compass bearing: frequency baseline 165 degrees magnetic.

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

LOCATION DESCRIPTION

Between Lyman and Loa, turn north towards Fremont to connect with SR 72. Travel up SR 72 until you cross a Forest Service boundary cattleguard (about 5 miles from Fremont). Continue another 2.7 miles to Forsyth Reservoir. Turn at the Forsyth Reservoir sign and drive down 0.3 miles to a fork. Turn right and continue 0.1 miles to where the road crosses Short Creek (which empties into the east cove of Forsyth). From Short Creek, go up 0.1 miles to a fork. Turn right and go 0.25 miles to a cattleguard. Continue 0.15 miles beyond the cattleguard to a fork. Take the right fork and go 0.55 miles to a draw below a ridge to the northeast. There is a steel rebar witness post on the right side of the road. The last baseline stake is located 500 feet away at a bearing of 5°M on top of the ridge. The 0-foot baseline stake is 400 feet due north, and has a red browse tag #7062 attached.



Map Name: Forsyth Reservoir, Utah

Diagrammatic Sketch

Township 26S , Range 3E , Section 24

GPS: NAD 27, UTM 12S 4265582 N, 454184 E

DISCUSSION

Forsyth Reservoir - Trend Study No. 25A-11

The Forsyth Reservoir study site transect is located on the top of a hill north of Forsyth Reservoir. The slope is 5% with a south-southeast aspect and an elevation of 8,400 feet. The area is managed by the Fish Lake National Forest as part of the Tidwell cattle allotment. Historically, the area has received heavy grazing by cattle and sheep, but with an especially high impact within the vicinity of the reservoir. A large area was sprayed with 2,4-D in the spring of 1976 to reduce shrub competition and release the grasses and forbs. A drought after the spraying impaired growth, but five years after the spraying it was noted by Forest Service personnel that there was fair grass production with good vigor. The study site is dominated by black sagebrush. The area is still used by cattle every other year in early June. It is used by deer and elk in the winter. Pellet group data from 1999 estimate 2 deer, 60 elk, and 7 cow days use/acre (5 ddu/ha, 148 edu/ha, 17 cdu/ha). Cattle pats and the majority of the elk pellet groups were from the spring of 1999. Pellet group data from 2004 estimated 2 deer (5 ddu/ha), 14 elk (35 edu/ha), and 4 cow days use/acre (11 cdu/ha). Cattle use was from the previous spring.

Soil on the site is moderately deep with an effective rooting depth estimated at just over 14 inches. Texture is a clay loam with a neutral pH (7.0). Phosphorus is low at only 2.6 ppm. Values below 10 ppm may limit normal plant growth and development. Rock and pavement cover are relatively high on the surface and the profile contains abundant gravel. Litter cover dropped in 1999, but rose back to previous levels in 2004. Percent bare soil is low ranging from 1 to 4% since 1985. The soil appears to absorb and hold water well and the layer of pavement effectively stops erosion. Overall protective cover is abundant.

The dominant browse on the site is black sagebrush which provided 66% of the total vegetation cover in 1999 and 49% in 2004. It has had extremely high densities ranging from 15,466 plants/acre in 1985, 21,133 in 1991, 28,180 in 1999, and decreased to 13,080 by 2004. Use of black sagebrush has been light to moderate in past readings, but only light use was observed in 2004. Vigor has remained good, but percent decadence has steadily increased from 9% in 1985 to 29% in 1999, and finally to 40% in 2004. Many of the decadent plants encountered had partial crown death likely due to drought and winter injury, combined with intraspecific competition. The percentage of plants classified as dying increased from 2% in 1999 to 19% by 2004. There are some scattered mountain big sagebrush plants on the site, which are more heavily hedged because of their higher preference.

Other common shrubs found on the site include fringed sage and stickyleaf low rabbitbrush. Density of fringed sage and stickyleaf low rabbitbrush declined considerable between 1991 and 1999, but most of the change is due to the much larger sample used in 1999. These low growing shrubs show light use and good vigor.

The herbaceous understory is diverse yet not particularly abundant considering the treatment. Grasses produced 23% of the total vegetation cover in 1999 and 40% in 2004, while forbs provided only 4% for last two readings. The dominant grass is the warm season blue grama, other perennial grasses such as Mutton bluegrass, bottlebrush squirreltail, and letterman needlegrass are also fairly abundant. Forbs are limited to a few low growing, poor value species like lobeleaf groundsel, rockcress, low fleabane, and longleaf phlox.

1985 APPARENT TREND ASSESSMENT

The soil appeared stable. Spraying has made this a dynamic vegetative community with many changes occurring. Grasses, as well as the key species black sagebrush, are doing well and increasing. The Forest Service has recommendations to re-spray the sagebrush by 1990. However, additional seeding and further restrictions on cattle grazing may be necessary in order to improve the site for cool season herbaceous species

and early spring use by wildlife and late spring use by cattle.

1991 TREND ASSESSMENT

The soil is still stable, with only 1% bare ground at this time. Fringed sagebrush and stickyleaf low rabbitbrush have increased in density. The key species, black sagebrush, also increased in density by 27%. The herbaceous understory has remained about the same, with few changes.

TREND ASSESSMENT

soil - stable (3)

browse - up slightly (4)

herbaceous understory - stable (3)

1999 TREND ASSESSMENT

Trend for soil is still considered stable even with the slight increase in bare soil, as it is still very low at only about 4%. The soil surface is still covered with pavement which provides adequate protection and erosion is not currently a problem. Trend for browse is stable for the key species, black sagebrush. Some of the changes in density of shrubs between 1991 and 1999 is the result of the larger sample used in 1999. Black sagebrush displays light to moderate use, good vigor, and excellent recruitment. The population currently appears to be at the maximum for the site. The dramatic decline in density of fringed sagebrush and stickyleaf low rabbitbrush also appears to be the result of the larger sample used this year which gives a more representative sample of shrub populations with discontinuous and/or clumped distributions. Trend for the herbaceous understory is stable even with the slight decrease in perennial grass nested frequency. This decrease is not enough to warrant a downward herbaceous trend as the perennial grasses contribute to 86% of the herbaceous component. Sum of nested frequency for blue grama declined slightly with frequency of bottlebrush squirreltail declining significantly. Forbs are limited to a few low growing, poor value species like rockcress, low fleabane, and longleaf phlox. The Desirable Components Index rated this site as good with a score of 65 due to good shrub cover, high shrub decadence, and fair perennial grass cover.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

winter range condition (DC Index) - 65 (good) Black sagebrush type

2004 TREND ASSESSMENT

Trend for soil is stable. Litter cover increased from low levels in 1999 and is close to previous years now. Soil erosion is not a problem on this site due to an abundance of protective cover. Trend for the key browse black sagebrush is down. Density has dropped from 28,180 plants/acre in 1999 to 13,080 in 2004. Part of this large drop is due to a large abundance of young sagebrush plants that may have been eliminated by drought. The number of dead plants increased from 720 plants/acre in 1999 to 6,080 in 2004. Almost half (40%) of the population was classified as decadent and 19% of the total population was identified as dying. Trend for the herbaceous understory is stable. Sum of nested frequency remained relatively the same as 1999. Forbs are small growing and contribute very little to overall cover. The Desirable Components Index rated this site as fair with a score of 55 due to fair shrub cover, increase shrub decadence, and excellent perennial grass cover.

TREND ASSESSMENT

soil - stable (3)

browse - down (1)

herbaceous understory - stable (3)

winter range condition (DC Index) - 55 (fair) Black sagebrush type

HERBACEOUS TRENDS --

Management unit 25A, Study no: 11

Type	Species	Nested Frequency				Average Cover %	
		'85	'91	'99	'04	'99	'04
G	Agropyron spicatum	-	-	-	1	-	.03
G	Agropyron trachycaulum	_b 14	_{ab} 4	_{ab} 9	_a -	.04	-
G	Bouteloua gracilis	_a 140	_b 184	_{ab} 166	_b 178	2.44	5.97
G	Carex spp.	_a 6	_a 6	_b 33	_b 42	.14	.46
G	Poa fendleriana	102	113	120	129	2.00	3.46
G	Sitanion hystrix	_b 156	_b 161	_a 85	_a 78	.66	1.36
G	Stipa comata	_a 1	_a -	_b 35	_a 11	.37	.15
G	Stipa lettermani	102	102	85	74	1.14	1.37
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		521	570	533	513	6.82	12.82
Total for Grasses		521	570	533	513	6.82	12.82
F	Androsace septentrionalis (a)	-	-	3	2	.03	.00
F	Arabis demissa	_c 143	_b 74	_a 25	_a 9	.05	.02
F	Astragalus lentiginosus	3	-	-	-	-	-
F	Astragalus spp.	-	-	-	3	-	.00
F	Chaenactis douglasii	_a 2	_b 14	_a 3	_{ab} 5	.00	.06
F	Erigeron pumilus	_d 137	_c 110	_b 66	_a 20	.19	.07
F	Gayophytum ramosissimum(a)	-	-	-	2	-	.01
F	Hymenoxys richardsonii	_a 1	_a -	_b 17	_a -	.70	-
F	Pedicularis centranthera	-	-	1	4	.00	.03
F	Penstemon spp.	-	1	9	-	.02	-
F	Phlox austromontana	-	-	2	-	.01	-
F	Phlox longifolia	_c 60	_b 33	_{ab} 19	_a 2	.05	.01
F	Polygonum douglasii (a)	-	-	-	2	-	.00
F	Senecio multilobatus	_a -	_a 3	_a 10	_b 42	.02	.86
Total for Annual Forbs		0	0	3	6	0.03	0.01
Total for Perennial Forbs		346	235	152	85	1.07	1.06
Total for Forbs		346	235	155	91	1.11	1.08

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

BROWSE TRENDS --

Management unit 25A, Study no: 11

Type	Species	Strip Frequency		Average Cover %	
		'99	'04	'99	'04
B	<i>Artemisia frigida</i>	31	25	.16	.29
B	<i>Artemisia nova</i>	96	96	19.44	15.63
B	<i>Artemisia tridentata vaseyana</i>	2	2	-	-
B	<i>Chrysothamnus nauseosus</i>	1	0	-	-
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	29	28	1.60	1.58
B	<i>Coryphantha vivipara arizonica</i>	2	1	.06	-
B	<i>Eriogonum microthecum</i>	9	7	.03	.09
B	<i>Gutierrezia sarothrae</i>	4	12	.01	.18
B	<i>Leptodactylon pungens</i>	2	2	-	-
B	<i>Pediocactus simpsonii</i>	2	3	.03	.01
B	<i>Pinus edulis</i>	1	1	-	-
B	<i>Tetradymia canescens</i>	1	1	-	-
Total for Browse		180	178	21.35	17.80

CANOPY COVER, LINE INTERCEPT --

Management unit 25A, Study no: 11

Species	Percent Cover
	'04
<i>Artemisia frigida</i>	.58
<i>Artemisia nova</i>	14.89
<i>Artemisia tridentata vaseyana</i>	.65
<i>Chrysothamnus viscidiflorus viscidiflorus</i>	2.01
<i>Gutierrezia sarothrae</i>	.30
<i>Pinus edulis</i>	.03

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 25A, Study no: 11

Species	Average leader growth (in)
	'04
<i>Artemisia nova</i>	1.4

BASIC COVER --

Management unit 25A, Study no: 11

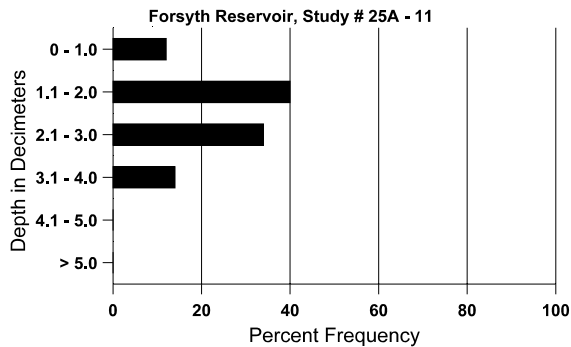
Cover Type	Average Cover %			
	'85	'91	'99	'04
Vegetation	5.75	10.75	32.02	31.75
Rock	6.25	2.75	14.71	9.88
Pavement	49.50	57.00	38.54	47.79
Litter	32.00	27.75	7.75	20.64
Cryptogams	4.75	.75	1.71	1.78
Bare Ground	1.75	1.00	3.56	4.67

SOIL ANALYSIS DATA --

Management unit 25A, Study no: 11, Study Name: Forsyth Reservoir

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
14.4	50.7 (9.6)	7.0	41.3	35.4	23.3	2.2	2.6	89.6	0.5

Stoniness Index



PELLET GROUP DATA --

Management unit 25A, Study no: 11

Type	Quadrat Frequency		Days use per acre (ha)	
	'99	'04	'99	'04
Rabbit	6	10	-	-
Elk	19	16	60 (148)	14 (35)
Deer	5	3	2 (5)	2 (5)
Cattle	2	1	7 (17)	4 (11)

BROWSE CHARACTERISTICS --
Management unit 25A, Study no: 11

		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)
Artemisia frigida												
85	23199	4866	13866	9333	-	-	0	0	0	-	0	2/4
91	20399	200	3266	15600	1533	-	30	14	8	.19	.65	2/3
99	2240	40	280	1960	-	-	8	0	0	-	0	4/6
04	1780	-	100	1660	20	20	2	0	1	-	0	7/9
Artemisia nova												
85	15466	9466	5733	8333	1400	-	19	2	9	.12	.43	7/10
91	21133	-	10533	7800	2800	-	15	7	13	1	5	6/11
99	28180	120	7640	12240	8300	720	37	.63	29	2	2	7/16
04	13080	240	40	7820	5220	6080	0	0	40	19	19	8/15
Artemisia tridentata vaseyana												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
99	40	-	-	40	-	-	50	50	-	-	0	11/25
04	40	-	-	40	-	-	0	0	-	-	0	18/34
Chrysothamnus nauseosus												
85	66	-	-	66	-	-	0	0	-	-	0	2/2
91	0	-	-	-	-	-	0	0	-	-	0	-/-
99	20	-	-	20	-	-	0	100	-	-	0	7/9
04	0	-	-	-	-	-	0	0	-	-	0	31/35
Chrysothamnus viscidiflorus viscidiflorus												
85	11732	800	2866	8666	200	-	0	0	2	-	.56	7/8
91	11932	133	2066	7666	2200	-	19	9	18	.33	4	3/4
99	1900	-	100	1720	80	-	2	1	4	2	2	6/11
04	1560	-	120	1320	120	20	0	0	8	1	1	6/11
Cowania mexicana stansburiana												
85	0	66	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
99	0	-	-	-	-	-	0	0	-	-	0	-/-
04	0	-	-	-	-	-	0	0	-	-	0	-/-
Coryphantha vivipara arizonica												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
99	120	-	-	120	-	-	0	0	-	-	0	1/2
04	20	-	-	20	-	-	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)
<i>Eriogonum microthecum</i>												
85	66	-	-	66	-	-	0	0	0	-	0	5/5
91	199	-	133	-	66	-	33	0	33	-	0	-/-
99	220	-	40	140	40	-	36	0	18	18	18	5/9
04	200	-	-	200	-	-	0	40	0	-	0	6/9
<i>Gutierrezia sarothrae</i>												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
99	80	-	-	80	-	-	0	0	-	-	0	6/7
04	340	-	20	320	-	-	0	0	-	-	0	7/8
<i>Leptodactylon pungens</i>												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
99	120	-	-	120	-	-	0	0	-	-	0	7/9
04	120	-	-	120	-	-	0	0	-	-	0	5/6
<i>Pediocactus simpsonii</i>												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
99	40	-	20	20	-	-	0	0	-	-	0	1/3
04	60	-	-	60	-	-	0	0	-	-	0	1/2
<i>Pinus edulis</i>												
85	0	66	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
99	20	-	20	-	-	-	0	0	-	-	0	-/-
04	20	-	20	-	-	-	100	0	-	-	0	-/-
<i>Tetradymia canescens</i>												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
99	20	-	-	20	-	-	0	0	-	-	0	7/10
04	20	-	-	20	-	-	0	0	-	-	0	10/21