Trend Study 27-5-08

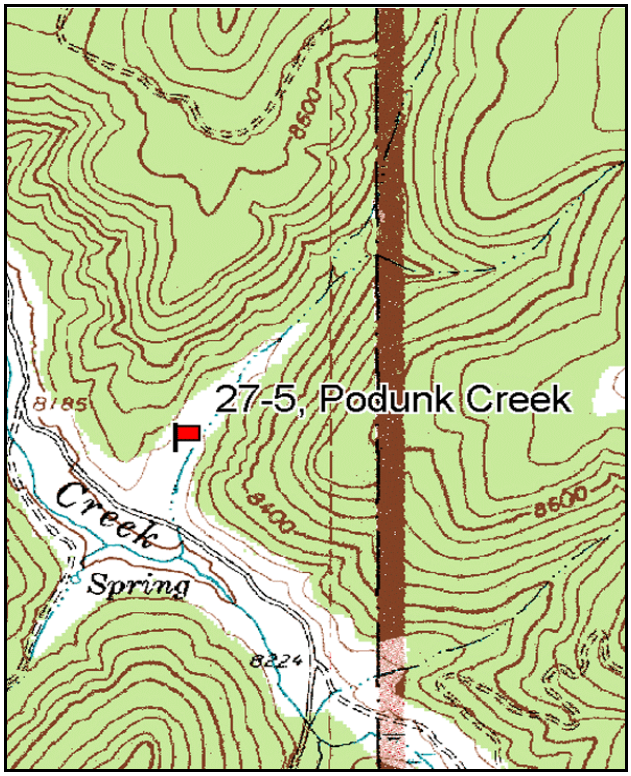
Study site name: Podunk Creek . Vegetation type: Dry Meadow .

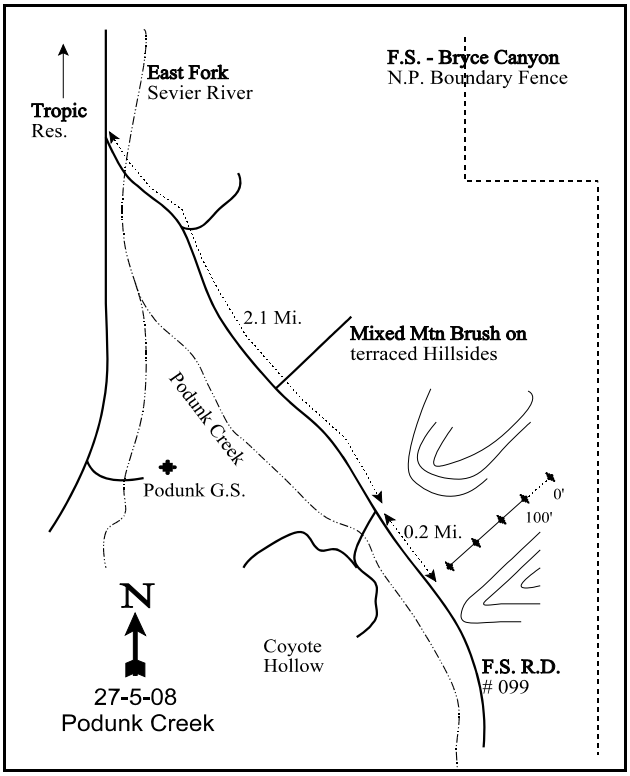
Compass bearing: frequency baseline 185 degrees magnetic.

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

LOCATION DESCRIPTION

Travel about 7.0 miles south from Tropic Reservoir on the East Fork of the Sevier River Road to a major fork. Turn left towards Podunk Creek and the park boundary. Travel 2.1 miles SE on the main road up Podunk Creek to a fork at Coyote Hollow. Stay left on USFS road #099 and continue about 0.2 miles to a point in the middle of the valley to the north. The transect is in the bottom of this seeded meadow valley. The end of the baseline can be found 125 feet north of the road. The study is marked by short fenceposts. The 0-foot baseline stake is 375 feet north of the end stake as the study runs from there back to the southwest.





Map Name: Podunk Creek

Diagrammatic Sketch

Township 38S , Range 4W , Section 19

GPS: NAD 83, UTM 12S 387734 E, 4148947 N

DISCUSSION

Podunk Creek - Trend Study No. 27-5

Study Information

This study is located in a narrow valley off of Podunk Creek, and samples a contour-trenched and seeded dry meadow [elevation: 8,200 feet (2,500 m), slope: 5%, aspect: south]. Due to serious erosion and gully formation caused by overgrazing in the early part of the areas grazing history, watershed rehabilitation treatments were undertaken in the 1960's all along the East Fork of the Sevier River drainage. The treatment here successfully established a dense stand of perennial grasses, stopped overland flows and erosion, and helped heal the adjacent gully. Erosion is now almost non-existent due to the contoured trenching treatment and the dense grass and litter cover. Pellet group counts estimated elk use to be very light in 2003 (4 edu/acre:10 edu/ha) and light in 2008 (11 edu/acre:26 edu/ha). There was no sign of deer encountered in 2003 and very light deer use was estimated in 2008 (3 ddu/acre:7 ddu/ha). This upper part of the East Fork watershed is grazed by cattle in late summer. Cattle use was estimated to be very heavy in 2003 (72 cdu/acre:177 cdu/ha) and moderately heavy in 2008 (36 cdu/acre:90 cdu/ha). Use by cattle has been moderate to heavy over the years due to the water source 200 yards away.

Soil

The soil is deep with an effective rooting depth of almost 19 inches. Soil texture analysis indicates it to be a clay loam with a neutral reaction (pH 7.2). Organic matter is relatively high at 4.1%, the highest amount on the unit. Relative combined vegetation and litter cover has been high at 72% in 1992, 74% in 1997, 61% in 2003, and 80% in 2008. Relative bare ground cover was 24% in 1992, 21% in 1997, 31% in 2003, and 16% in 2008. Very little evidence of erosion was present on the site in 1997, 2003, or 2008. The soil erosion condition rating was classified as stable in 2003, and 2008.

Browse

Browse is not a significant component of this community. The surrounding hills are dominated by mixed conifer and aspen (*Populus tremuloides*) with no evidence of forest invading into the meadow. The larger sampling method used beginning in 1992 picked up a small number of shrubs. The only fairly common species found are several species of rabbitbrush (*Chrysothamnus* spp.). These shrubs show occasional moderate or heavy use, but most are unutilized.

Herbaceous Understory

A very dense stand of grasses characterizes the meadow. Smooth brome (*Bromus inermis*) is the most abundant species having been sampled in nearly every quadrat in all surveys, and providing 87%, 95%, and 87% of the total grass cover in 1997, 2003, and 2008, respectively. Smooth brome is a vigorous, rhizomatous species which is a sod former and provides excellent ground cover. Smooth brome also is an excellent forage plant for livestock and wildlife. Letterman needlegrass (*Stipa lettermani*), Kentucky bluegrass (*Poa pratensis*), and mountain muhly (*Muhlenbergia montana*) were all common prior to the 2003 reading, but all three of these species declined in nested frequency with dry conditions in 2003. The three species rebounded somewhat by the 2008 reading. Due to heavy livestock use in 1987, little seed production was observed that summer. Use was moderate in 1992 and 1997 with grasses showing good seed production. Grass production was only fair in 2003 with the drought, and grasshopper use was noted as being high. Grass production was good and seed production was moderate in 2008, with very little use from wildlife and livestock. Forbs provide a fair forage source on the site as well. The most numerous species have included western aster (*Aster occidentalis*), trailing fleabane (*Erigeron flagellaris*), redroot eriogonum (*Eriogonum racemosum*), and northwest cinquefoil (*Potentilla gracilis*).

1992 TREND ASSESSMENT

The trend for browse is not important on this summer range as it only makes up 4% of the total vegetative cover. However, trend for browse for this site appears stable, but almost non-existent. The herbaceous understory is very vigorous and is dominated by 1 species (smooth brome). Trend for grasses is stable and trend for forbs is slightly up with regard to their sum of nested frequency values.

browse - stable (0) grass - stable (0) forb - slightly up (+1)

1997 TREND ASSESSMENT

Trend for the small browse component appears slightly up although not an important aspect on this summer range. Trend for the grasses is slightly down. Sum of nested frequency of perennial grasses declined by 25% since 1992 and production declined from 44% in 1992 to 26%. With these statistics, trend for grasses would have been considered down, but most of the change is due to a decrease in frequency and cover of the introduced perennial species Kentucky bluegrass. The nested frequency of the dominant species, smooth brome has not changed significantly since 1987. Trend for forbs is down. The sum of nested frequency of perennial forbs has declined by 41% since 1992 and production decreased from 16% in 1992 to just 6%.

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

2003 TREND ASSESSMENT

Trend for browse is slightly down as the combined density of the rabbitbrush species declined significantly in 2003. However, as stated previously, the browse component is relatively unimportant on this meadow. Trend for the grasses is down. The sum of nested frequency of perennial grasses declined by a further 32% since 1997. There was a significant decrease in the frequency of Letterman needlegrass and mountain muhly and the frequency of Kentucky bluegrass decreased, as well. The decrease in frequency of these three species was probably due to drought conditions. The frequency of the dominant grass species, smooth brome, remained relatively constant, but with the decrease in other species it now comprises 95% of the total grass cover. The trend for forbs is slightly up. Sum of nested frequency and production of perennial forbs increased. All of the increase in forb frequency can be attributed to the low growing increaser trailing fleabane which has little forage value.

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

2008 TREND ASSESSMENT

Trend for browse is stable with an increase in the combined density of rabbitbrush species. As mentioned above, shrubs are minimal on this site and considered unimportant for forage. Trend for grasses is up. Sum of nested frequency and production of perennial grasses increased 34% since 2003. The three species, Letterman needlegrass, mountain muhly, and Kentucky bluegrass, all had increases in nested frequency and cover. The trend for forbs is stable with a constant sum of nested frequency of perennial forbs since 2003. There was a slight increase in production of perennial forbs from just under 8% of total cover in 2003 to over 9%.

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

HERBACEOUS TRENDS --
Management unit 27 , Study no: 5

Type	Species	Nested Frequency					Average Cover %			
		'87	'92	'97	'03	'08	'92	'97	'03	'08
G	Agropyron intermedium	b18	a-	a-	a-	ab4	-	-	-	.06
G	Bromus inermis	356	348	357	343	354	31.07	22.11	21.77	30.26
G	Koeleria cristata	ab10	b15	a-	a-	a-	.27	-	-	-
G	Muhlenbergia montana	b60	b75	b85	a6	b66	1.50	1.56	.06	1.66
G	Poa fendleriana	ab1	ab2	a-	ab5	b16	.15	-	.03	.10
G	Poa pratensis	b227	b248	a44	a13	a41	7.19	.22	.07	.26
G	Poa secunda	4	-	-	1	11	-	-	.00	.01
G	Stipa columbiana	-	3	3	-	-	.03	.00	-	-
G	Stipa lettermani	b152	b178	b167	a79	a107	4.14	1.66	1.06	2.31
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		828	869	656	447	599	44.36	25.55	23.01	34.68
Total for Grasses		828	869	656	447	599	44.36	25.55	23.01	34.68
F	Antennaria rosea	-	8	6	4	13	.56	.30	.18	1.43
F	Androsace septentrionalis (a)	-	bc24	a-	c32	b11	.11	-	.10	.02
F	Artemisia dracunculus	-	-	8	-	1	-	.36	-	.00
F	Arenaria fendleri	10	-	-	-	-	-	-	-	-
F	Astragalus convallarius	a-	b164	a1	a-	a-	3.01	.00	-	-
F	Aster occidentalis	b40	a-	c124	b39	c113	-	1.39	.21	2.14
F	Astragalus sp.	2	-	-	6	-	.00	-	.06	-
F	Castilleja linariaefolia	-	-	3	-	-	-	.00	-	-
F	Calochortus nuttallii	-	-	-	-	2	-	-	-	.00
F	Cruciferae	5	-	-	-	-	-	-	-	-
F	Equisetum sp.	2	-	-	-	-	-	-	-	-
F	Eriogonum alatum	-	-	-	-	3	-	-	-	.00
F	Erigeron flagellaris	d298	c194	a53	c227	b139	4.52	.65	5.21	2.75
F	Erigeron sp.	a-	a-	b18	a-	a-	-	.11	-	-
F	Eriogonum racemosum	ab17	ab18	b29	a10	ab15	.75	.64	.22	.22
F	Hymenoxys richardsonii	4	6	-	-	2	.09	-	-	.00
F	Potentilla concinna	a-	a-	a-	b44	b26	-	-	1.24	1.45
F	Polygonum douglasii (a)	-	-	a5	a-	b27	-	.02	-	.06
F	Potentilla gracilis	ab36	ab82	b51	a15	ab25	6.46	2.15	.46	1.34
F	Polygonum sp.	a-	b14	a-	a-	a-	.03	-	-	-
F	Senecio douglasii	-	-	-	-	7	-	-	-	.04
F	Senecio spartioides	9	4	-	-	-	.01	-	-	-

Type	Species	Nested Frequency					Average Cover %			
		'87	'92	'97	'03	'08	'92	'97	'03	'08
F	Taraxacum officinale	3	-	-	-	-	-	-	-	-
F	Tragopogon dubius	3	7	-	10	1	.09	-	.02	.00
F	Unknown forb-perennial	2	-	-	-	-	-	-	-	-
F	Vicia americana	-	2	-	-	-	.00	-	-	-
Total for Annual Forbs		0	24	5	32	38	0.10	0.01	0.10	0.09
Total for Perennial Forbs		431	499	293	355	347	15.56	5.63	7.62	9.42
Total for Forbs		431	523	298	387	385	15.67	5.65	7.72	9.51

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

BROWSE TRENDS --
Management unit 27 , Study no: 5

Type	Species	Strip Frequency				Average Cover %			
		'92	'97	'03	'08	'92	'97	'03	'08
B	Chrysothamnus nauseosus hololeucus	0	12	0	0	-	1.09	-	-
B	Chrysothamnus parryi	5	0	6	9	.78	.15	.00	.31
B	Chrysothamnus vaseyi	34	44	4	0	1.75	3.19	.03	-
B	Chrysothamnus viscidiflorus lanceolatus	6	2	26	39	.18	.30	.78	2.43
B	Gutierrezia sarothrae	1	1	2	0	.00	.15	.00	-
Total for Browse		46	59	38	48	2.71	4.88	0.81	2.74

CANOPY COVER, LINE INTERCEPT --
Management unit 27 , Study no: 5

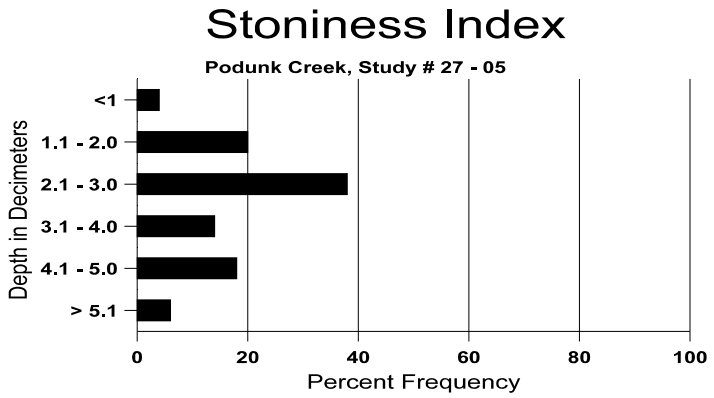
Species	Percent Cover	
	'03	'08
Chrysothamnus parryi	-	.88
Chrysothamnus vaseyi	.33	-
Chrysothamnus viscidiflorus lanceolatus	1.20	2.83

BASIC COVER --
Management unit 27 , Study no: 5

Cover Type	Average Cover %				
	'87	'92	'97	'03	'08
Vegetation	19.75	53.47	39.04	32.59	48.91
Rock	1.25	5.67	.96	3.80	1.10
Pavement	3.50	0	4.96	5.92	3.87
Litter	52.00	28.00	39.34	34.06	40.95
Cryptogams	0	.00	0	0	0
Bare Ground	23.50	27.11	22.03	33.68	17.53

SOIL ANALYSIS DATA --
Management unit 27, Study no: 5, Study Name: Podunk Creek

Effective rooting depth (in)	Temp °F (depth)	pH	clay loam			%0M	PPM P	PPM K	dS/m
			%sand	%silt	%clay				
18.5	60.0 (18.1)	7.2	31.7	37.7	30.6	4.1	24.5	332.8	0.7



PELLET GROUP DATA --
Management unit 27 , Study no: 5

Type	Quadrat Frequency			
	'92	'97	'03	'08
Rabbit	-	-	-	4
Elk	-	3	-	2
Deer	3	4	-	2
Cattle	6	23	32	36

Days use per acre (ha)	
'03	'08
-	-
4 (10)	11 (26)
-	3 (7)
72 (177)	36 (90)

BROWSE CHARACTERISTICS --
Management unit 27 , Study no: 5

		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)
Chrysothamnus nauseosus hololeucus												
87	**0**	-	-	-	-	-	0	0	-	-	0	-/-
92	**0**	-	-	-	-	-	0	0	-	-	0	-/-
97	**480**	-	280	200	-	-	0	0	-	-	0	16/19
03	**0**	-	-	-	-	-	0	0	-	-	0	-/-
08	**0**	-	-	-	-	-	0	0	-	-	0	-/-
Chrysothamnus parryi												
87	**0**	-	-	-	-	-	0	0	0	-	0	-/-
92	**120**	-	40	40	40	-	33	0	33	-	0	-/-
97	**0**	-	-	-	-	-	0	0	0	-	0	19/21
03	**200**	-	-	160	40	-	40	0	20	-	20	14/18
08	**260**	-	20	160	80	-	0	0	31	-	0	17/22
Chrysothamnus vaseyi												
87	**0**	-	-	-	-	-	0	0	0	-	0	-/-
92	**2860**	-	440	2180	240	-	0	0	8	-	3	-/-
97	**4060**	-	20	4040	-	-	0	0	0	-	0	6/13
03	**100**	-	-	100	-	-	0	40	0	-	0	13/17
08	**0**	-	-	-	-	-	0	0	0	-	0	-/-
Chrysothamnus viscidiflorus lanceolatus												
87	**0**	-	-	-	-	-	0	0	0	-	0	-/-
92	**340**	-	40	180	120	-	18	0	35	-	0	-/-
97	**80**	-	40	40	-	-	0	0	0	-	0	10/11
03	**1180**	-	-	900	280	-	0	0	24	-	0	9/14
08	**2840**	180	100	2740	-	-	8	.70	0	-	0	8/15
Eriogonum microthecum												
87	**0**	-	-	-	-	-	0	0	-	-	0	-/-
92	**0**	-	-	-	-	-	0	0	-	-	0	-/-
97	**0**	-	-	-	-	-	0	0	-	-	0	17/18
03	**0**	-	-	-	-	-	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)
Gutierrezia sarothrae												
87	**0**	-	-	-	-	-	0	0	0	-	0	-/-
92	**20**	-	-	20	-	-	0	0	0	-	0	-/-
97	**20**	-	-	20	-	-	0	0	0	-	0	15/20
03	**60**	-	-	20	40	-	0	0	67	-	0	4/4
08	**0**	-	-	-	-	-	0	0	0	-	0	-/-