

Trend Study 14-20-04

Study site name: Gooseberry.

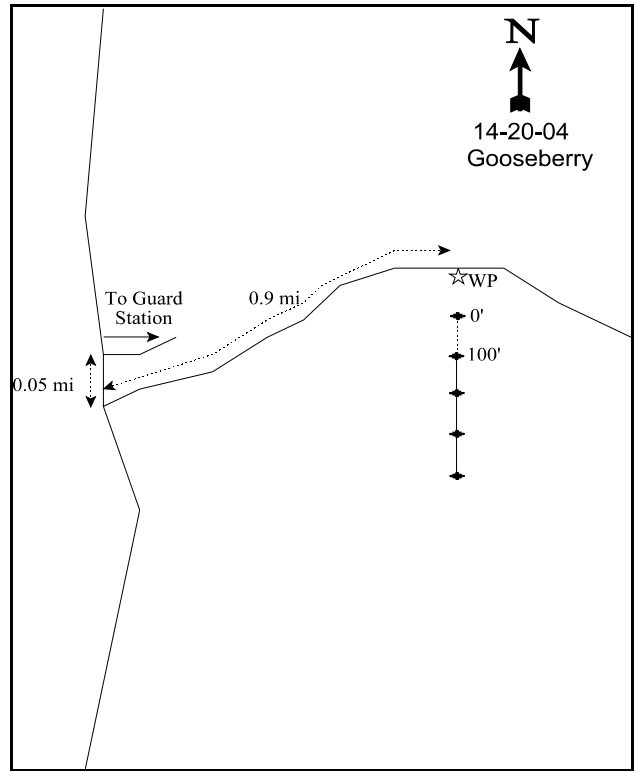
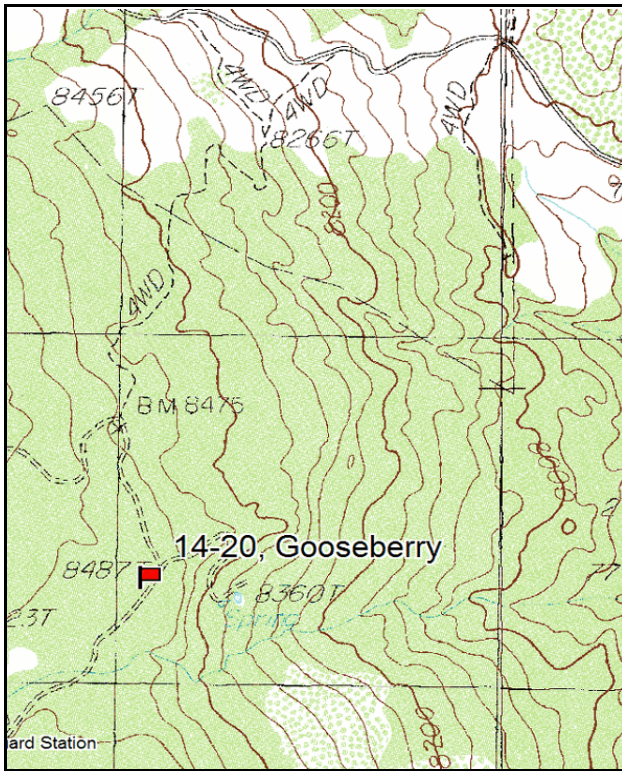
Vegetation type: Logged Ponderosa Pine.

Compass bearing: frequency baseline 165 degrees magnetic.

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

LOCATION DESCRIPTION

Drive 0.05 miles south past the turnoff to the Gooseberry Guard Station on Elk Ridge to a road turning off to the left (east). Proceed down this road past the guard station, corral and water troughs for 0.9 miles and stop at a witness post on the right side of the road. (If you go to far, the road starts to drop down 150 feet past this point). The 0-foot baseline stake is 100 feet south, and is marked by a green full-high fence post tagged with browse tag #7878. Fence posts were used to mark all the transect plots.



Map Name: Poison Canyon

Diagrammatic Sketch

Township 34S, Range 20E, Section 18

GPS: NAD 27, UTM 12S 4187266 N, 609057 E

DISCUSSION

Gooseberry - Trend Study No. 14-20

The Gooseberry Interagency trend study samples mixed ponderosa pine-aspen summer range on northern end of Elk Ridge. The study is found at an elevation of 8,500 feet on the western rim of Elk Ridge. Thick aspen groves dominate below the rim, but on top aspen clumps are scattered through the predominately ponderosa pine forest. Old growth pines were removed with a selective over story harvest in 1963. The area was scheduled for a shelter-wood cut in 1993 or 1994. Some logging activities were evident during the 1999 reading. Slash was common on the site and logs were piled up on the nearby road. Several small aspen along with study site fence posts were bent over by logging equipment.

The Forest Service manages grazing on the area, which is in the Gooseberry allotment. The grazing system involves rotation grazing with three pastures in the allotment. These units are never rested for an entire season, which is June 1 to October 15. The stocking rate is 200 head of cattle. Water is available in nearby Duck Lake where deer, elk, and cattle are frequently seen. Otherwise, water is limited on top of the plateau. Several deer were seen near the study site in 1999. Pellet group data from the site in 1999 estimated 11 deer days use/acre (27 ddu/ha), 11 elk days use/acre (27 edu/ha), and 26 cow days use/acre (64 cdu/ha). In 2004, pellet group data estimated 3 deer days use/acre (7 ddu/ha), 14 elk days use/acre (35 edu/ha), and 22 cow days use/acre (5 cdu/ha). A large herd of elk was seen in the meadow near the guard station.

Soil depth is highly variable with some areas of exposed bedrock. Effective rooting depth estimates vary from 13 to 28 inches. Soil texture is a loam with a slightly acid pH (6.1). Soil phosphorus is low at just 4 ppm. The extensive rock layer underneath can be seen in the nearby exposed cliffs and a deep (15 foot) narrow crack in the rock, almost like a slot canyon, east of the baseline. There are some bare soils in the open, but overall there is excellent litter cover. Litter cover is very high for each reading. Due to the level terrain, there is little hazard of erosion. Some trampled and disturbed places display soil movement, but it is not severe.

The transect runs through the edge of an aspen grove, but aspen is less prevalent in surrounding areas where more Ponderosa pine predominate. Point quarter data from 1999 estimated 48 aspen/acre. Average stem diameter was 5.0 inches. In 2004, density increased slightly to 53 trees/acre, with an average diameter of 3.9 inches. Prior to 2004 aspen were mainly mature trees (25-30 feet tall), so most forage production is unavailable for animal use. Small young trees and suckers are available and were moderate to heavily utilized in 1992. In 2004 there were many young suckers. Ninety percent of the aspen counted in the density strips were young. Point quarter data in 1999 estimated 157 Ponderosa pine trees/acre with an average diameter of 5.7 inches. Density increased to 166 trees/acre in 2004, with an average diameter of 4.3 inches. Many young ponderosa pines were noted in 2004.

The most abundant and available browse is mountain snowberry. It contributes to most of the available browse. More than 50% of the snowberry population were young plants in 1986 and 1992. The population has matured in 1999 and 2004. Use was light to moderate in 1986 and 1992, and very light in 1999 and 2004. Density was highest in 1992. Over 50% of the population was classified as young. Density estimates for 1999 were similar to 1986 estimates at about 7,800 plants/acre. In 2004, density declined to 6,300 plants/acre. The decline can be attributed to a loss of young plants. Percent decadence did not increase and mature plants have remained stable. A variety of other palatable browse species also occur including, low-growing myrtle pachystima, serviceberry, and scattered oak. Oregon grape is also numerous.

The herbaceous understory is diverse and moderately abundant considering the amount of litter cover and shade from tree canopy. Identifying grasses was difficult because of heavy livestock use in 1986. In 1992, overall utilization was moderate and many grasses produced seed. Common grasses include, Kentucky bluegrass (increaser with moderate grazing), sedge, bottlebrush squirreltail, nodding brome, Columbian

needlegrass, and slender wheatgrass. Only light use was noted on the grasses in 1999. Diversity of forbs is also high. The most conspicuous species was thicketleaf peavine, which showed light use. Low growing forbs like yarrow, spreading fleabane, starwort, and longleaf phlox are abundant. Sum of nested frequency for perennial grasses and forbs have declined steadily since 1992.

1986 APPARENT TREND ASSESSMENT

A variety of browse and herbaceous forage is available on this site. The aspen appears to be preferred and heavy use may affect regeneration and future availability. Other browse plants are vigorous and produce abundant forage. Herbaceous vegetation, especially grasses, are utilized heavily by cattle. Cattle appear to be responsible for the excessive utilization of young aspen. Vegetative trend is probably stable overall, although the trend will certainly be affected by future logging programs and continued cattle use. The soil trend is stable. It is difficult to assign a trend without a clear management objective which identifies the importance of key species for providing adequate forage for big game animals.

1992 TREND ASSESSMENT

Soil trend is stable with percent bare ground down to only 2%. Protective ground cover is abundant and erosion minimal. Of the key or most preferred browse species, only serviceberry experienced a downward trend. Density is still moderately low at 680 plants/acre, which is an 11% decrease in density. It also shows an increase (from 4% to 41%) in the proportion of the population that is now heavily browsed. However, this should not be used as the principal criteria for the management of wildlife species in this area because serviceberry only makes about 1% of the total browse cover. The other preferred species, which make up the other 99% of the browse cover have shown increases in their populations indicating an upward trend for browse. The grasses make up 76% of the herbaceous understory cover, with Kentucky bluegrass providing 31% of that cover. Kentucky bluegrass is an increaser with moderate livestock use. Trend for the herbaceous understory is stable. The proportion of the herbaceous understory that is composed of Kentucky bluegrass should be monitored to determine additional changes in compositional trend.

TREND ASSESSMENT

soil - stable (3)

browse - up (5)

herbaceous understory - stable (3)

1999 TREND ASSESSMENT

Trend for soil remains stable with abundant vegetation and especially litter cover. Unprotected bare ground is rare and erosion is not a problem on the site. Trend for browse is considered down slightly. Use is mostly light and vigor is generally normal, but population densities of all species declined since 1992. Cover of shrubs declined substantially for most shrubs, while strip frequency of understory shrubs is also lower. Some of these changes may be due to the canopy cover and increased shading of Ponderosa pine and aspen. Average overhead canopy cover of Ponderosa pine is estimated at 35%, while aspen averages 13%. No canopy cover estimates are available from 1992 to compare with. Trend for the herbaceous understory is stable with similar sum of nested frequencies of perennial grasses and forbs. While nested frequency of perennial grasses remained similar compared to 1992, cover declined nearly 4 fold. Cover of forbs increased from nearly 8% cover to 12%. Some of these cover differences are likely due to time the study was read and the timing of precipitation. This study was read in late August of 1992 and in late June of 1999 (6/23).

TREND ASSESSMENT

soil - stable (3)

browse - slightly down (2)

herbaceous understory - stable (3)

2004 TREND ASSESSMENT

The soil trend is stable. Vegetation and litter are very abundant and protect the soil surface. The browse trend is stable. Density and cover for most browse species has remained stable. Utah serviceberry density was higher and many young plants were sampled. Use has been light. Snowberry density has declined but, cover has remained stable. Density of aspen and Ponderosa pine increased and many young aspens were sampled. Cover was down for aspen since 1999 (line intercept method). The herbaceous understory is overall stable. Sum of nested frequency of perennial grasses has not changed since 1999, while cover was up to 10% from 7% in 1999. Kentucky bluegrass is the most abundant species and nested frequency has remained stable since 1986. Forb abundance and cover has slightly declined since 1999, but is still abundant. Cover declined from 12 to 8%.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --

Management unit 14 , Study no: 20

Type	Species	Nested Frequency				Average Cover %		
		'86	'92	'99	'04	'92	'99	'04
G	Agropyron intermedium	ab13	a-	a3	b17	-	.03	.11
G	Agropyron scribneri	a-	b22	a-	a-	1.42	-	-
G	Agropyron spicatum	3	-	-	-	-	-	-
G	Agropyron trachycaulum	a-	b44	c101	b32	1.59	.96	.63
G	Bromus anomalus	b50	b68	a19	a19	5.02	.11	.36
G	Bromus inermis	18	25	25	24	.31	.52	.43
G	Carex spp.	a-	c64	bc47	b41	1.70	.91	.89
G	Dactylis glomerata	ab10	a-	a1	b18	-	.00	.26
G	Festuca ovina	a-	b10	ab4	a-	.33	.31	-
G	Festuca thurberi	-	-	-	-	-	-	.00
G	Koeleria cristata	b12	b14	a-	ab3	.08	-	.01
G	Muhlenbergia montana	b46	a5	a4	a-	.06	.03	-
G	Phleum pratense	b19	b16	a-	b21	.45	-	.24
G	Poa fendleriana	16	17	5	17	.09	.01	.17
G	Poa pratensis	182	161	194	158	7.88	3.19	4.44
G	Sitanion hystrix	b69	c105	a14	bc75	3.54	.10	1.06
G	Stipa columbiana	b83	a39	a31	a22	1.07	.53	.97

Type	Species	Nested Frequency				Average Cover %		
		'86	'92	'99	'04	'92	'99	'04
	Total for Annual Grasses	0	0	0	0	0	0	0
	Total for Perennial Grasses	521	590	448	447	23.59	6.74	9.61
	Total for Grasses	521	590	448	447	23.59	6.74	9.61
F	<i>Achillea millefolium</i>	c171	b111	a76	ab90	1.43	.99	.53
F	<i>Antennaria rosea</i>	a-	b11	ab10	b10	.63	.36	.48
F	<i>Arenaria congesta</i>	-	3	3	-	.00	.03	-
F	<i>Aster chilensis</i>	6	6	2	-	.15	.06	-
F	<i>Astragalus consobrinus</i>	-	-	-	4	-	-	.06
F	<i>Calochortus nuttallii</i>	-	2	4	-	.01	.01	-
F	<i>Collinsia parviflora</i> (a)	-	a-	b21	ab9	-	.04	.02
F	<i>Crepis acuminata</i>	-	-	3	-	-	.00	-
F	<i>Delphinium nuttallianum</i>	a-	a-	b26	a-	-	.06	-
F	<i>Erigeron flagellaris</i>	b37	ab26	a17	a13	.61	.13	.10
F	<i>Geranium</i> spp.	2	-	-	-	-	-	-
F	<i>Lathyrus lanszwertii</i>	132	106	138	102	2.11	4.80	2.76
F	<i>Lomatium</i> spp.	-	4	5	-	.03	.04	-
F	<i>Lychnis drummondii</i>	4	-	-	-	-	-	-
F	<i>Microsteris gracilis</i> (a)	-	a-	a5	b21	-	.03	.04
F	<i>Osmorhiza occidentalis</i>	-	-	-	6	-	-	.06
F	<i>Penstemon</i> spp.	-	4	1	-	.02	.00	-
F	<i>Phlox longifolia</i>	c97	b36	ab17	a10	.76	.06	.02
F	<i>Polygonum douglasii</i> (a)	-	a2	ab13	b16	.01	.05	.04
F	<i>Pterospora andromedea</i>	-	-	3	-	-	.04	-
F	<i>Senecio integerrimus</i>	b61	a12	a9	a14	.17	.05	.04
F	<i>Sisymbrium altissimum</i> (a)	-	-	2	-	-	.00	-
F	<i>Smilacina stellata</i>	1	-	-	-	-	-	-
F	<i>Stellaria jamesiana</i>	a2	b81	c168	c145	.55	3.21	2.85
F	<i>Taraxacum officinale</i>	b59	b64	b56	a25	.57	.96	.16
F	<i>Thalictrum fendleri</i>	-	-	4	-	-	.03	-
F	<i>Thlaspi</i> spp.	a-	b11	ab10	b14	.03	.02	.02
F	<i>Trifolium repens</i>	49	42	45	41	.42	1.30	.71
F	Unknown forb-perennial	1	-	-	-	-	-	-
	Total for Annual Forbs	0	2	41	46	0.00	0.13	0.09
	Total for Perennial Forbs	622	519	597	474	7.55	12.21	7.82
	Total for Forbs	622	521	638	520	7.56	12.35	7.92

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

BROWSE TRENDS --

Management unit 14 , Study no: 20

Type	Species	Strip Frequency			Average Cover %		
		'92	'99	'04	'92	'99	'04
B	Amelanchier utahensis	13	9	13	.13	.07	.09
B	Mahonia repens	68	62	63	3.37	1.80	3.06
B	Pachistima myrsinites	19	4	4	.50	.06	.03
B	Pinus ponderosa	13	16	14	30.55	.98	1.06
B	Populus tremuloides	13	5	14	10.94	.03	.13
B	Purshia tridentata	-	-	-	.03	-	-
B	Quercus gambelii	5	3	3	1.37	.06	.15
B	Rosa woodsii	22	7	8	.05	.03	-
B	Symphoricarpos oreophilus	90	89	85	20.68	15.04	14.82
Total for Browse		243	195	204	67.66	18.07	19.37

CANOPY COVER, LINE INTERCEPT --

Management unit 14 , Study no: 20

Species	Percent Cover	
	'99	'04
Amelanchier utahensis	-	.11
Mahonia repens	-	2.03
Pachistima myrsinites	-	.23
Pinus ponderosa	34.79	32.23
Populus tremuloides	13.19	7.44
Quercus gambelii	-	.08
Rosa woodsii	-	.08
Symphoricarpos oreophilus	-	23.46

POINT-QUARTER TREE DATA --

Management unit 14 , Study no: 20

Species	Trees per Acre	
	'99	'04
Pinus ponderosa	48	166
Populus tremuloides	157	53
Quercus gambelii	25	-

Average diameter (in)	
'99	'04
5.1	4.3
5.7	3.9
2.8	-

BASIC COVER --

Management unit 14 , Study no: 20

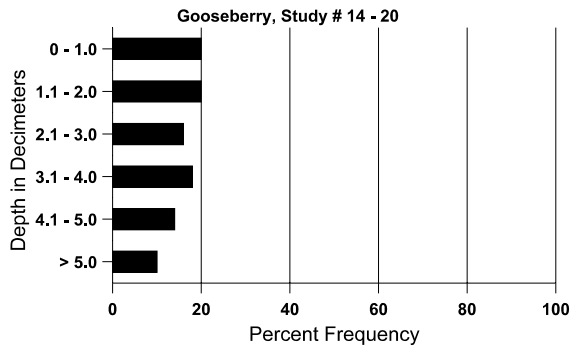
Cover Type	Average Cover %			
	'86	'92	'99	'04
Vegetation	9.25	64.87	37.21	38.58
Rock	0	.37	.09	.73
Pavement	0	0	.01	.01
Litter	81.25	84.88	93.13	74.26
Cryptogams	.50	.76	.12	.39
Bare Ground	9.00	1.52	1.28	2.42

SOIL ANALYSIS DATA --

Management unit 14, Study no: 20, Study Name: Gooseberry

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
20.8	45.7 (15.2)	6.1	45.4	34.0	20.6	3.0	4.0	89.6	0.4

Stoniness Index



PELLET GROUP DATA --

Management unit 14 , Study no: 20

Type	Quadrat Frequency		
	'92	'99	'04
Rabbit	4	1	-
Elk	6	2	3
Deer	8	-	3
Cattle	3	1	-

Days use per acre (ha)	
'99	'04
-	-
11 (27)	14 (35)
11 (27)	3 (7)
26 (64)	2 (5)

BROWSE CHARACTERISTICS --
Management unit 14 , Study no: 20

		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												
86	766	233	433	333	-	-	13	4	0	-	0	11/5
92	680	20	620	-	60	-	59	41	9	-	0	-/-
99	220	200	220	-	-	-	0	0	0	-	0	-/-
04	460	-	380	80	-	-	17	9	0	-	0	7/9
Mahonia repens												
86	4199	700	1366	2433	400	-	0	0	10	-	10	6/6
92	15300	1080	7800	7400	100	-	1	0	1	-	6	-/-
99	6060	-	700	5320	40	-	0	0	1	-	.66	4/7
04	4820	-	360	4380	80	-	2	0	2	-	.82	4/6
Pachistima myrsinites												
86	1132	1200	466	666	-	-	0	6	-	-	0	5/6
92	2380	240	1860	520	-	-	61	0	-	-	0	-/-
99	180	20	100	80	-	-	0	0	-	-	0	5/18
04	280	-	-	280	-	-	0	0	-	-	0	4/5
Pinus ponderosa												
86	166	-	166	-	-	-	0	0	0	-	0	-/-
92	280	380	140	140	-	-	0	0	0	-	0	-/-
99	340	60	200	120	20	20	0	6	6	6	6	-/-
04	300	20	200	100	-	20	0	0	0	-	7	-/-
Populus tremuloides												
86	33	33	33	-	-	-	0	0	0	-	0	-/-
92	400	560	200	100	100	-	35	20	25	10	35	-/-
99	160	80	100	60	-	80	0	0	0	-	0	-/-
04	580	-	520	60	-	40	3	0	0	-	0	-/-
Quercus gambelii												
86	0	66	-	-	-	-	0	0	0	-	0	-/-
92	640	60	500	-	140	-	0	25	22	3	3	-/-
99	280	-	280	-	-	-	0	0	0	-	0	-/-
04	100	-	80	20	-	60	0	0	0	-	0	8/10
Rosa woodsii												
86	766	100	500	233	33	-	13	0	4	-	0	10/8
92	900	260	740	120	40	-	18	2	4	-	2	-/-
99	160	-	160	-	-	-	0	0	0	-	0	-/-
04	340	-	160	180	-	-	0	0	0	-	0	5/4

		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)
Symphoricarpos oreophilus												
86	7899	1466	4333	3466	100	-	42	5	1	-	0	22/20
92	13200	1880	6900	6060	240	-	33	4	2	.15	2	-/-
99	7840	660	1920	5780	140	160	0	0	2	-	0	19/24
04	6300	-	400	5740	160	20	10	0	3	.63	.63	18/24