

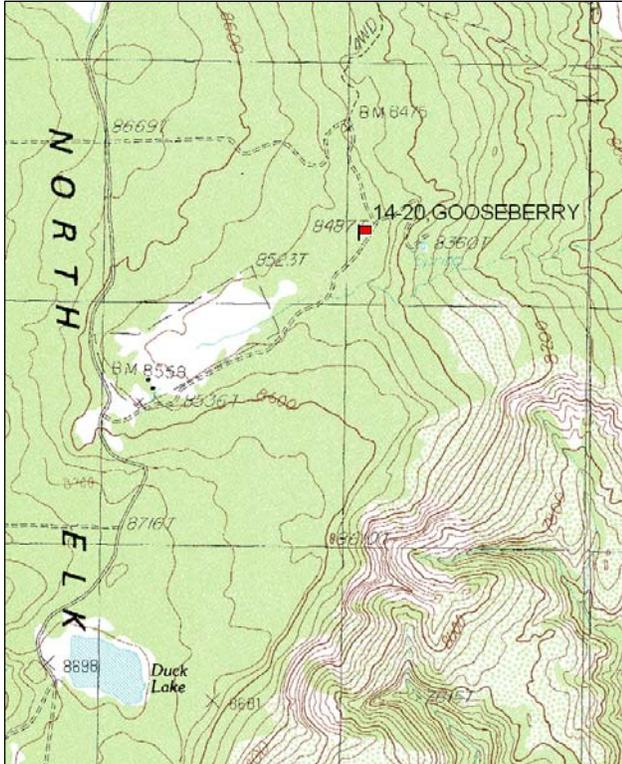
GOOSEBERRY - TREND STUDY NO. 14-20-09

Vegetation Type: Logged Ponderosa Pine
Range Type: Crucial Deer Summer, Crucial Elk Summer
NRCS Ecological Site Description: Not Available
Land Ownership: USFS
Elevation: 8,500 ft (2,591 m)
Aspect: Northeast
Slope: 2%
Transect bearing: 165 degrees magnetic.
Belt placement: line 1 (11 & 71ft), line 2 (34ft), line 3 (59ft), line 4 (95ft)

Directions:

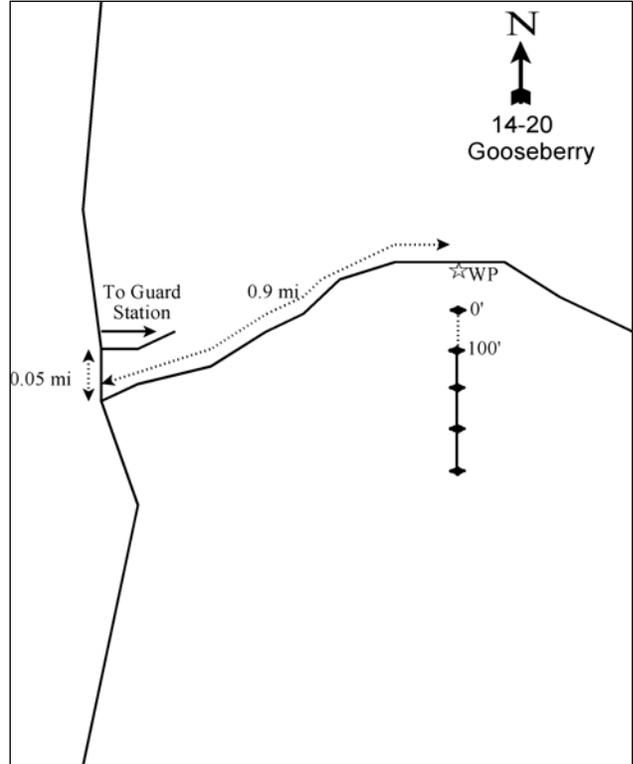
Drive 0.05 miles south past the turnoff to the Gooseberry Guard Station on Elk Ridge to a road turning off to the left (east). Proceed down this road past the guard station, corral and water troughs for 0.9 miles and stop at a witness post on the right side of the road. (If you go to far, the road starts 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



Township: 34S, Range: 20E, Section: 18

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 608994 E 4187470 N

GOOSEBERRY - TREND STUDY NO. 14-20

Site Information

Site Description: The study samples a mixed ponderosa pine (*Pinus ponderosa*) and aspen (*Populus tremuloides*) summer range on the northwest rim of Elk Ridge just north of the Gooseberry guard station. The area is managed by the Forest Service as part of the Gooseberry allotment. 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. Pellet group data indicates light use by deer and elk since 1999. Estimated cattle use was moderate in 1999, but has been light since 2004 (Table - Pellet Group Data).

Browse: The transect runs through the edge of an aspen grove, but aspen is less prevalent in surrounding areas where ponderosa pine predominate. The population of ponderosa pine has remained similar in point-quarter density and average diameter since 1999. Point quarter data has indicated an increase in aspen density and a decrease in average basal diameter since 1999 indicating a younger population (Table - Point-Quarter Tree Data). The increase in young aspen plants was also noted in the shrub strip frequency data (Table - Browse Characteristics).

The most abundant and available browse is mountain snowberry (*Symphoricarpos oreophilus*), which provides most of the available browse cover on the site (Table - Browse Trends). A variety of other palatable browse species also occur including myrtle pachystima (*Pachystima myrsinites*), Utah serviceberry (*Amelanchier utahensis*), Woods rose (*Rosa woodsii*), and scattered Gambel oak (*Quercus gambelii*).

Herbaceous Understory: The herbaceous understory is diverse and quite abundant considering the amount of litter cover and shade from tree canopy. Common grasses include Kentucky bluegrass (*Poa pratensis*), sedge (*Carex sp.*), bottlebrush squirreltail (*Sitanion hystrix*), and subalpine needlegrass (*Stipa columbiana*). Diversity of forbs is also high. The dominant species in cover was thistleleaf peavine (*Lathyrus lanszwertii*), which showed light use. Low growing forbs like western yarrow (*Achillea millefolium*) and tuber starwort (*Stellaria jamesiana*) are abundant.

Soil: The soil is a loam with a slightly acid pH and a highly variable effective rooting depth with some areas of exposed bedrock. Soil phosphorus has a low availability for plant growth and development just 4 ppm (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). There are some bare soils in the open, but overall there is excellent litter cover (Table - Basic Cover). The soil erosion condition was classified as stable in 2004 and 2009.

Trend Assessments

Browse:

- **1986 to 1992 - stable (0):** Differences in density may be related to the larger sample area used in 1992; therefore, trend was determined using other parameters. There was little change in any of the preferred browse populations. Aspen showed an increase in decadence and poor vigor, though there was an increase in the recruitment of young aspen plants.
- **1992 to 1999 - down (-2):** There was a decrease in density of serviceberry, Gambel oak, and Woods rose, as well as a slight decrease in cover. Density of aspen also decreased, though there was a decrease in decadence and poor vigor.
- **1999 to 2004 - slightly up (+1):** There was an increase in the density of serviceberry and Woods rose, though Gambel oak density continued to decrease. None of these species provides much cover. The density of aspen increased markedly with a substantial increase in the recruitment of young plants. The overhead canopy cover of aspen decreased from 13% to 7%.

- **2004 to 2009 - stable (0):** Density and cover of preferred browse species remained similar. The overhead canopy cover of aspen decreased to 6%.

Grass:

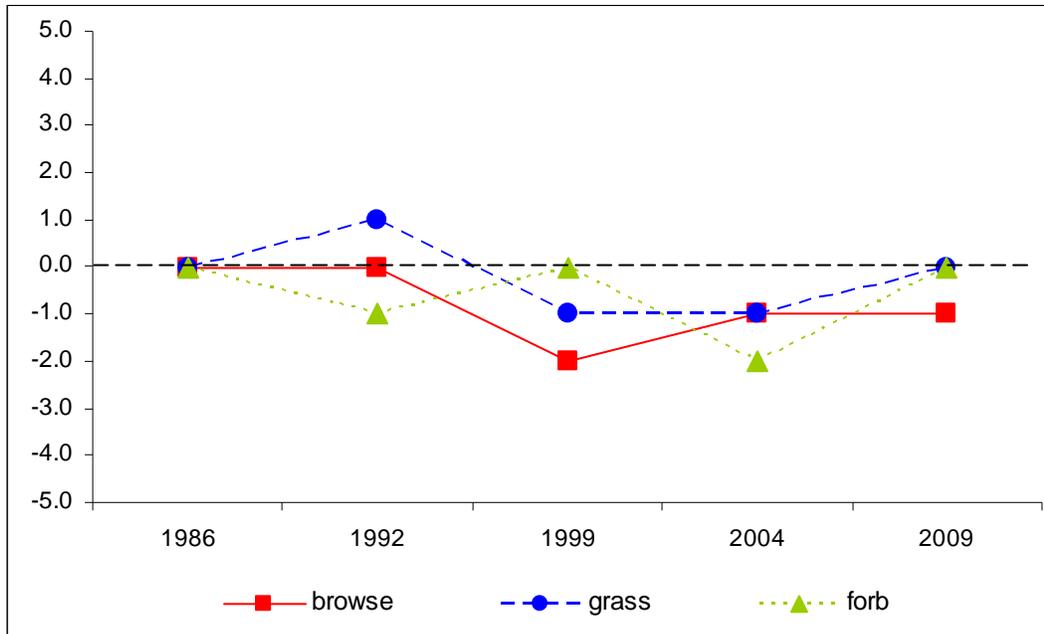
- **1986 to 1992 - slightly up (+1):** The sum of nested frequency of perennial grasses increased by 13% with a significant increase in the nested frequency of slender wheatgrass (*Agropyron trachycaulum*), sedge, and bottlebrush squirreltail.
- **1992 to 1999 - down (-2):** The sum of nested frequency of perennial grasses decreased by 24% and cover decreased from 24% to 7%. There was a significant decrease in the nested frequency of bottlebrush squirreltail and a significant increase in the nested frequency of slender wheatgrass.
- **1999 to 2004 - stable (0):** There was little change in the sum of nested frequency of perennial grasses, though there was a slight increase in cover. There was a significant increase in the nested frequency of bottlebrush squirreltail and a significant decrease in the nested frequency of slender wheatgrass.
- **2004 to 2009 - slightly up (+1):** The sum of nested frequency of perennial grasses increased by 13% and cover increased to 15%. Mutton bluegrass (*Poa fendleriana*) increased significantly in nested frequency and bottlebrush squirreltail decreased significantly. Bulbous bluegrass (*Poa bulbosa*) was sampled in low frequency for the first time in 2009.

Forb:

- **1986 to 1992 - slightly down (-1):** The sum of nested frequency of perennial forbs decreased by 17% with a significant decrease in yarrow, longleaf phlox (*Phlox longifolia*), and lambstongue groundsel (*Senecio integerrimus*). There was a significant increase in the nested frequency of tuber starwort.
- **1992 to 1999 - slightly up (+1):** The sum of nested frequency of perennial forbs increased by 15% and cover increased from 8% to 12%. Tuber starwort increased significantly in nested frequency and yarrow decreased significantly.
- **1999 to 2004 - down (-2):** There was a 21% decrease in the sum of nested frequency of perennial forbs and cover decreased to 8%. There was a significant decrease in the nested frequency of dandelion (*Taraxacum officinale*).
- **2004 to 2009 - up (+2):** The sum of nested frequency of perennial forbs increased 27% and cover increased to 13%.

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 14, Study no: 20



HERBACEOUS TRENDS--
Management unit 14, Study no: 20

Type	Species	Nested Frequency					Average Cover %			
		'86	'92	'99	'04	'09	'92	'99	'04	'09
G	Agropyron intermedium	ab13	a-	a3	ab17	b48	-	.03	.11	.29
G	Agropyron scribneri	a-	b22	a-	a-	a-	1.42	-	-	-
G	Agropyron spicatum	3	-	-	-	-	-	-	-	-
G	Agropyron trachycaulum	a-	b44	c101	b32	b14	1.59	.96	.63	.11
G	Bromus anomalus	b50	b68	a19	a19	a13	5.02	.11	.36	.43
G	Bromus inermis	18	25	25	24	28	.31	.52	.43	.91
G	Bromus tectorum (a)	-	-	-	-	2	-	-	-	.38
G	Carex sp.	a-	b64	b47	b41	b69	1.70	.91	.89	1.34
G	Dactylis glomerata	ab10	a-	a1	b18	ab6	-	.00	.26	.18
G	Festuca ovina	-	10	4	-	-	.33	.31	-	-
G	Festuca thurberi	-	-	-	-	-	-	-	.00	-
G	Koeleria cristata	b12	b14	a-	ab3	a-	.08	-	.01	-
G	Muhlenbergia montana	b46	a5	a4	a-	a-	.06	.03	-	-
G	Phleum pratense	b19	b16	a-	b21	b11	.45	-	.24	.63
G	Poa bulbosa	-	-	-	-	2	-	-	-	.01
G	Poa fendleriana	a16	a17	a5	a17	b57	.09	.01	.17	2.15
G	Poa pratensis	182	161	194	158	170	7.88	3.19	4.44	5.75
G	Sitanion hystrix	b69	c105	a14	bc75	a29	3.54	.10	1.06	.61
G	Stipa columbiana	c83	ab39	ab31	a22	bc55	1.07	.53	.97	2.33
G	Stipa comata	-	-	-	-	3	-	-	-	.15
Total for Annual Grasses		0	0	0	0	2	0	0	0	0.37

Type	Species	Nested Frequency					Average Cover %			
		'86	'92	'99	'04	'09	'92	'99	'04	'09
	Total for Perennial Grasses	521	590	448	447	505	23.59	6.74	9.61	14.92
	Total for Grasses	521	590	448	447	507	23.59	6.74	9.61	15.30
F	<i>Achillea millefolium</i>	c171	b111	a76	ab90	ab101	1.43	.99	.53	1.86
F	<i>Antennaria rosea</i>	a-	b11	b10	b10	b12	.63	.36	.48	.63
F	<i>Arenaria congesta</i>	-	3	3	-	2	.00	.03	-	.03
F	<i>Aster chilensis</i>	6	6	2	-	3	.15	.06	-	.15
F	<i>Astragalus consobrinus</i>	-	-	-	4	-	-	-	.06	-
F	<i>Calochortus nuttallii</i>	-	2	4	-	5	.01	.01	-	.06
F	<i>Collinsia parviflora</i> (a)	-	-	21	9	7	-	.04	.02	.01
F	<i>Crepis acuminata</i>	-	-	3	-	2	-	.00	-	.00
F	<i>Cymopterus</i> sp.	-	-	-	-	3	-	-	-	.03
F	<i>Delphinium nuttallianum</i>	a-	a-	b26	a-	a5	-	.06	-	.01
F	<i>Erigeron flagellaris</i>	b37	ab26	ab17	a13	ab18	.61	.13	.10	.28
F	<i>Eriogonum</i> sp.	-	-	-	-	3	-	-	-	.03
F	<i>Geranium</i> sp.	2	-	-	-	-	-	-	-	-
F	<i>Lathyrus lanszwertii</i>	132	106	138	102	115	2.11	4.80	2.76	4.36
F	<i>Lomatium</i> sp.	-	4	5	-	3	.03	.04	-	.00
F	<i>Lychnis drummondii</i> <i>drummondii</i>	4	-	-	-	-	-	-	-	-
F	<i>Microsteris gracilis</i> (a)	-	-	a5	b21	b36	-	.03	.04	.09
F	<i>Osmorhiza occidentalis</i>	-	-	-	6	2	-	-	.06	.00
F	<i>Penstemon</i> sp.	-	4	1	-	7	.02	.00	-	.06
F	<i>Phlox longifolia</i>	c97	b36	ab17	a10	ab30	.76	.06	.02	.25
F	<i>Polygonum douglasii</i> (a)	-	a2	ab13	b16	b17	.01	.05	.04	.06
F	<i>Pterospora andromedea</i>	-	-	3	-	-	-	.04	-	-
F	<i>Senecio integerrimus</i>	c61	ab12	a9	ab14	b37	.17	.05	.04	.34
F	<i>Sisymbrium altissimum</i> (a)	-	-	2	-	-	-	.00	-	-
F	<i>Smilacina stellata</i>	1	-	-	-	-	-	-	-	-
F	<i>Stellaria jamesiana</i>	a2	b81	c168	c145	c164	.55	3.21	2.85	2.82
F	<i>Taraxacum officinale</i>	c59	c64	bc56	a25	ab37	.57	.96	.16	.72
F	<i>Thalictrum fendleri</i>	-	-	4	-	-	-	.03	-	-
F	<i>Thlaspi</i> sp.	-	11	10	14	5	.03	.02	.02	.01
F	<i>Trifolium repens</i>	49	42	45	41	49	.42	1.30	.71	1.62
F	Unknown forb-perennial	1	-	-	-	-	-	-	-	-
	Total for Annual Forbs	0	2	41	46	60	0.00	0.13	0.09	0.17
	Total for Perennial Forbs	622	519	597	474	603	7.55	12.21	7.82	13.33
	Total for Forbs	622	521	638	520	663	7.56	12.35	7.92	13.51

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	'09	'92	'99	'04	'09
B	Amelanchier utahensis	13	9	13	9	.13	.07	.09	.23
B	Mahonia repens	68	62	63	67	3.37	1.80	3.06	3.05
B	Pachistima myrsinites	19	4	4	13	.50	.06	.03	.04
B	Pinus ponderosa	13	16	14	14	30.55	.98	1.06	2.62
B	Populus tremuloides	13	5	14	13	10.94	.03	.13	.21
B	Purshia tridentata	0	0	0	0	.03	-	-	-
B	Quercus gambelii	5	3	3	5	1.37	.06	.15	.38
B	Rosa woodsii	22	7	8	11	.05	.03	.00	.30
B	Symphoricarpos oreophilus	90	89	85	87	20.68	15.04	14.82	16.77
Total for Browse		243	195	204	219	67.66	18.07	19.37	23.62

CANOPY COVER, LINE INTERCEPT--

Management unit 14, Study no: 20

Species	Percent Cover		
	'99	'04	'09
Amelanchier utahensis	-	.11	.35
Mahonia repens	-	2.03	2.11
Pachistima myrsinites	-	.23	.30
Pinus ponderosa	34.79	32.23	50.75
Populus tremuloides	13.19	7.44	5.59
Quercus gambelii	-	.08	.41
Rosa woodsii	-	.08	.28
Symphoricarpos oreophilus	-	23.46	26.45

POINT-QUARTER TREE DATA--

Management unit 14, Study no: 20

Species	Trees per Acre			Average diameter (in)		
	'99	'04	'09	'99	'04	'09
Pinus ponderosa	157	166	140	5.7	4.3	6.3
Populus tremuloides	48	53	69	5.1	3.9	2.9
Quercus gambelii	25	-	25	2.8	-	1.6

BASIC COVER--

Management unit 14, Study no: 20

Cover Type	Average Cover %				
	'86	'92	'99	'04	'09
Vegetation	9.25	64.87	37.21	38.58	44.20
Rock	0	.37	.09	.73	.04
Pavement	0	0	.01	.01	.07
Litter	81.25	84.88	93.13	74.26	87.32
Cryptogams	.50	.76	.12	.39	.25
Bare Ground	9.00	1.52	1.28	2.42	3.64

SOIL ANALYSIS DATA --

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

Effective rooting depth (in)	pH	loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
20.8	6.1	45.4	34	20.6	3	4	89.6	0.4

PELLET GROUP DATA--

Management unit 14, Study no: 20

Type	Quadrat Frequency				Days use per acre (ha)		
	'92	'99	'04	'09	'99	'04	'09
Rabbit	4	1	-	-	-	-	-
Elk	6	2	3	3	11 (27)	14 (35)	5 (12)
Deer	8	-	3	1	11 (27)	3 (7)	5 (13)
Cattle	3	1	-	-	26 (64)	2 (5)	3 (7)

BROWSE CHARACTERISTICS--

Management unit 14, Study no: 20

		Age class distribution					Utilization		
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Amelanchier utahensis									
86	766	57	43	0	233	13	4	0	11/5
92	680	91	0	9	20	59	41	0	-/-
99	220	100	0	0	200	0	0	0	-/-
04	460	83	17	0	-	17	9	0	7/9
09	300	67	33	0	200	0	0	0	13/14
Mahonia repens									
86	4198	33	58	10	699	0	0	10	6/6
92	15300	51	48	1	1080	1	0	6	-/-
99	6060	12	88	1	-	0	0	.66	4/7
04	7820	5	94	1	-	2	0	.51	4/6
09	10440	46	53	0	120	0	0	0	4/7
Pachistima myrsinites									
86	1132	41	59	-	1199	0	6	0	5/6
92	2380	78	22	-	240	61	0	0	-/-
99	180	56	44	-	20	0	0	0	5/18
04	280	0	100	-	-	0	0	0	4/5
09	800	43	58	-	-	0	0	0	4/5
Pinus ponderosa									
86	166	100	0	0	-	0	0	0	-/-
92	280	50	50	0	380	0	0	0	-/-
99	340	59	35	6	60	0	6	6	-/-
04	300	67	33	0	20	0	0	7	-/-
09	380	53	47	0	400	0	0	11	-/-

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<i>Populus tremuloides</i>									
86	33	100	0	0	33	0	0	0	-/-
92	400	50	25	25	560	35	20	35	-/-
99	160	63	38	0	80	0	0	0	-/-
04	580	90	10	0	-	3	0	0	-/-
09	620	87	10	3	280	0	0	0	-/-
<i>Quercus gambelii</i>									
86	0	0	0	0	66	0	0	0	-/-
92	640	78	0	22	60	0	25	3	-/-
99	280	100	0	0	-	0	0	0	-/-
04	100	80	20	0	-	0	0	0	8/10
09	180	100	0	0	-	0	0	0	9/11
<i>Rosa woodsii</i>									
86	765	65	30	4	99	13	0	0	10/8
92	900	82	13	4	260	18	2	2	-/-
99	160	100	0	0	-	0	0	0	-/-
04	340	47	53	0	-	0	0	0	5/4
09	400	25	75	0	-	0	0	0	8/7
<i>Symphoricarpos oreophilus</i>									
86	7898	55	44	1	1466	42	5	0	22/20
92	13200	52	46	2	1880	33	4	2	-/-
99	7840	24	74	2	660	0	0	0	19/24
04	6500	9	88	2	-	10	.30	.61	18/24
09	10680	15	85	0	160	.56	0	.18	18/23