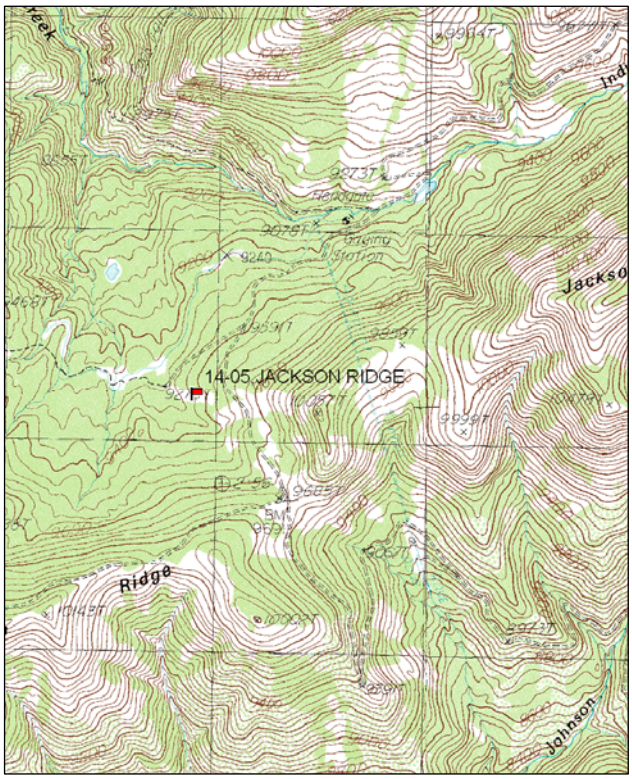
JACKSON RIDGE - TREND STUDY NO. 14-5-09

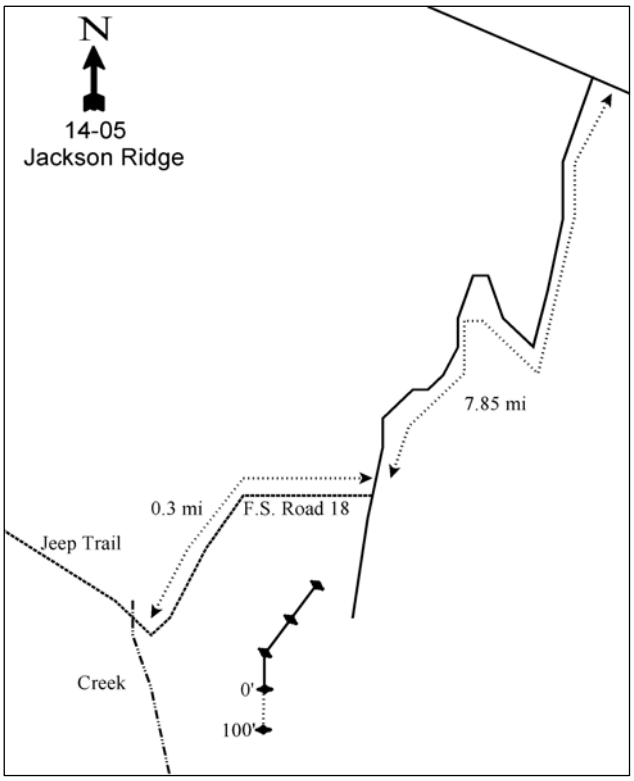
Vegetation Type: Aspen
Range Type: Crucial Deer Summer, Crucial Elk Summer
NRCS Ecological Site Description: Not Available
Land Ownership: USFS
Elevation: 9,400 ft (2,865 m)
Aspect: Southwest
Slope: 21%-35%
Transect bearing: 180 degrees magnetic.
Belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

Directions:
From the junction of the Blue Mountain Road and the North Creek-Indian Creek Road (just west of Dalton Springs campground), go 7.25 miles to Indian Creek. From the crossing, continue 0.55 miles to a fork. Stay left on the main road. Continue 0.05 miles to another small fork to the right. Go down this jeep trail (F.S. Road 18) 0.3 miles to a sharp right bend in the road near a small stream. Stop here and walk southeast (105°M) up the clearing for 490 feet. The 0-foot baseline stake is a 4-foot tall green fence post with browse tag #479 attached.

Map Name: Mt. Linnaeus



Diagrammatic Sketch:



Township: 34S, Range: 22E, Section: 9

GPS: NAD 83, UTM 12S 630829 E 4188397 N

JACKSON RIDGE - TREND STUDY NO. 14-5

Site Information

Site Description: The study samples a moderately steep meadow in an aspen-spruce-fir forest on the headwaters of Indian Creek in the southern part of the Abajo Mountains. Water is not a limiting factor and the small perennial stream flowing northwest down the slope towards Indian Creek contains water late in the year. Annual precipitation is at least 20 inches per year. Because of an underground aqueduct moving water from this drainage, this area is considered part of the Blanding municipal watershed. Consequently, cattle grazing is not permitted on this part of the Manti-La Sal National Forest. However, cattle do sometimes break fence and trespass from the Camp Jackson allotment. Pellet group data has indicated light use from deer and elk since 1999. Minimal cattle use was measured in both 2004 and 2009 (Table - Pellet Group Data).

Browse: Surrounding the small meadow is a thick grove of quaking aspen (*Populus tremuloides*), Engelmann spruce (*Picea engelmannii*), white fir (*Abies concolor*), and Douglas fir (*Pseudotsuga menziesii*). The forest provides excellent cover for big game. There are young trees on the edge and these young aspen trees showed moderate to heavy use on all available portions of the plants in 1986, but use has been mostly light since then (Table - Browse Characteristics). All the mature aspen in the meadow are unavailable due to height. The overhead canopy cover of aspen has steadily increased from 21% in 1999 to 33% in 2009 (Table - Canopy Cover). Snowberry (*Symphoricarpos oreophilus*) occurs infrequently in the meadow with some plants showing moderate browsing in some sample years (Table - Browse Characteristics).

Herbaceous Understory: Because this is summer range, the herbaceous plants are the more important part of the community for wildlife. The herbaceous understory is diverse and abundant on the site. There are several native grasses on the site but the most abundant grass species is Kentucky bluegrass (*Poa pratensis*). Kentucky bluegrass has provided well over half of the total grass cover on the site since 1994. Other common grasses include slender wheatgrass (*Agropyron trachycaulum*), orchard grass (*Dactylis glomerata*), mountain brome (*Bromus carinatus*), a *Carex sp.*, and letterman needlegrass (*Stipa lettermani*). Many valuable and palatable forb species are common, including thickleaf peavine (*Lathyrus lanszwertii*), American vetch (*Vicia americana*), dandelion (*Taraxacum officinale*), and silvery lupine (*Lupinus argenteus*). Forbs have contributed over 60% of total vegetation cover since 1994.

Soil: The soil is a clay loam with a moderately acidic pH and a moderately deep effective rooting depth (Table - Soil Analysis Data). The soil has good vegetation and litter cover which provides excellent soil protection (Table - Basic Cover). The soil erosion condition was classified as stable in 2004 and 2009.

Trend Assessments

Browse:

- **1986 to 1994 - slightly up (+1):** Aspen was mistakenly not sampled in the density strips in 1994, so no comparison can be made. Vigor of aspen did appear to have improved, but browse is not a particularly important part of this summer range.
- **1994 to 1999 - stable (0):** There was little change in the browse component. The increase in density of aspen is likely due to the larger sample area used in 1994.
- **1999 to 2004 - stable (0):** There was little change in the density of aspen, but the overhead canopy cover increased from 21% to 31%.
- **2004 to 2009 - slightly down (-1):** Density of aspen decreased 40% from 600 plants/acre to 360 plants/acre due primarily to a decrease in the recruitment of young aspen plants. The overhead canopy cover of aspen increased slightly to 33%.

Grass:

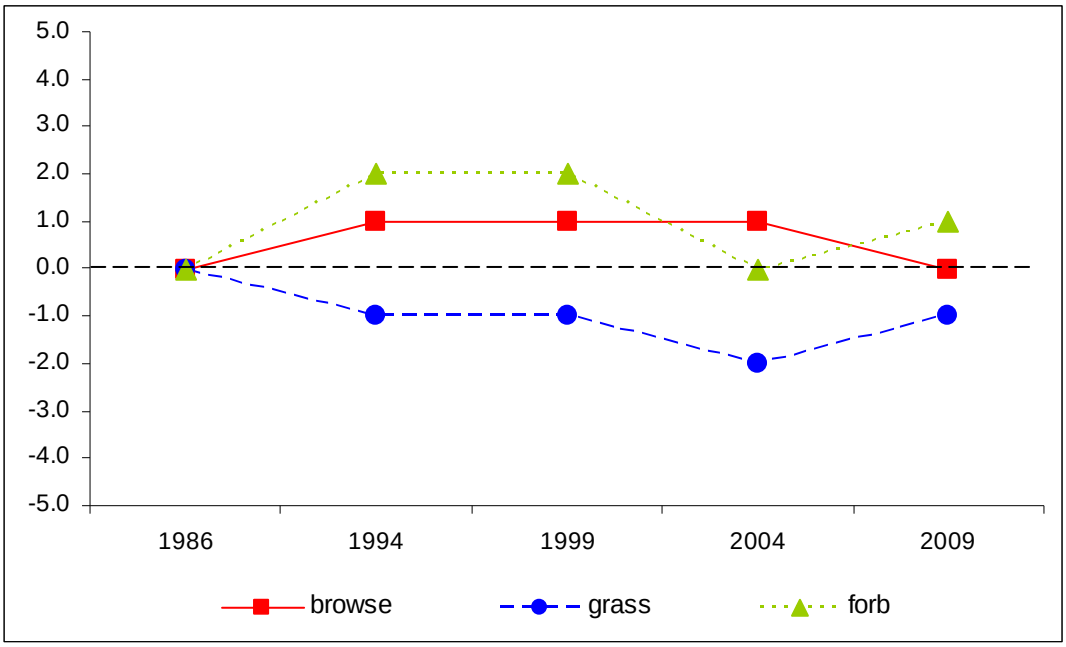
- **1986 to 1994 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 15%. There was a significant decrease in the nested frequency of mountain brome and Kentucky bluegrass.
- **1994 to 1999 - stable (0):** There was little change in the sum of nested frequency of perennial grasses, but cover increased from 11% to 17%. There was a significant increase in the nested frequency of Letterman needlegrass.
- **1999 to 2004 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 12% and cover decreased to 15%. There was a significant increase in the nested frequency of the *Carex sp.* and a significant decrease in nested frequency of Kentucky bluegrass.
- **2004 to 2009 - slightly up (+1):** There was a 9% increase in the sum of nested frequency of perennial grasses and cover increased to 23%. There was a significant increase in the nested frequency of mountain brome, orchard grass, and Kentucky bluegrass.

Forb:

- **1986 to 1994 - up (+2):** The sum of nested frequency of perennial forbs increased by 50% with a significant increase in many of the palatable perennial forb species.
- **1994 to 1999 - stable (0):** There was a 9% decrease in the sum of nested frequency of perennial forbs, but cover increased from 24% to 28%.
- **1999 to 2004 - down (-2):** There was a 34% decrease in the sum of nested frequency of perennial forbs, though cover remained similar.
- **2004 to 2009 - slightly up (+1):** The sum of nested frequency of perennial forbs increased 18%, and cover increased to 44%.

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 14, Study no: 5



HERBACEOUS TRENDS--
Management unit 14, Study no: 5

Type	Species	Nested Frequency					Average Cover %			
		'86	'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron spicatum	b22	a-	a-	a-	a-	-	-	-	-
G	Agropyron trachycaulum	b104	b68	b55	b78	a12	.94	.62	1.95	.63
G	Bromus carinatus	bc48	a19	a8	ab31	c72	.27	.21	.53	2.57
G	Carex sp.	a5	abc21	ab7	c30	bc30	.43	.07	1.08	2.55
G	Dactylis glomerata	a3	ab9	b28	ab25	c65	.19	1.12	.73	1.79
G	Phleum pratense	1	-	4	-	-	-	.03	-	-
G	Poa pratensis	d362	c341	cd357	a251	b307	8.45	13.86	8.68	14.28
G	Poa secunda	-	-	-	-	8	-	-	-	.30
G	Stipa columbiana	-	-	-	-	2	-	-	-	.06
G	Stipa lettermani	bc48	ab45	c76	bc58	a19	.24	1.25	2.01	1.14
G	Trisetum spicatum	4	8	-	-	-	.66	-	-	-
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		597	511	535	473	515	11.20	17.17	15.00	23.35
Total for Grasses		597	511	535	473	515	11.20	17.17	15.00	23.35
F	Achillea millefolium	bc280	c291	c286	ab250	a253	6.55	9.22	7.01	12.02
F	Agoseris glauca	c37	bc23	ab13	abc22	a2	.10	.05	.10	.03
F	Androsace septentrionalis (a)	-	bc36	b55	a22	a31	.08	.21	.74	.09
F	Arabis sp.	-	1	10	5	-	.00	.07	.01	-
F	Aster sp.	-	-	-	-	4	-	-	-	.06
F	Castilleja sp.	-	-	-	1	1	-	-	.03	.03
F	Cerastium arvense	a-	b10	a-	a-	a-	.02	-	-	-
F	Chenopodium album (a)	-	a2	a-	a2	b12	.00	-	.00	.12
F	Cirsium sp.	-	-	-	-	7	-	-	-	.19
F	Cirsium wheeleri	a6	ab10	b24	ab18	ab6	.02	.49	.52	.60
F	Collomia linearis (a)	-	a-	a-	a-	b21	-	-	-	.31
F	Conioselinum scopulorum	-	11	-	-	7	1.32	-	-	.56
F	Delphinium nuttallianum	a-	b78	c190	a5	a4	.21	2.13	.01	.01
F	Descurainia pinnata (a)	-	-	-	-	-	-	-	-	.00
F	Erigeron engelmannii	10	10	-	-	-	.09	-	-	-
F	Erigeron flagellaris	b102	ab96	ab52	ab53	a47	.55	.29	.35	1.27
F	Erigeron sp.	a-	a-	a-	a-	b17	-	-	-	.13
F	Erigeron speciosus	ab10	b24	a2	a-	a-	.52	.06	-	-
F	Fragaria vesca	39	15	18	25	24	.24	.55	.37	.96
F	Galium bifolium (a)	-	ab9	b16	a-	a-	.01	.21	-	-
F	Gentiana amarella heterosepala	9	8	-	-	-	.01	-	-	-
F	Lathyrus lanszwertii	a16	a40	b92	b92	b97	1.56	2.41	5.93	6.05
F	Lupinus argenteus	a32	b92	bc122	a54	c132	1.64	2.38	4.05	6.47
F	Lupinus sp.	-	-	-	2	-	-	-	.01	-
F	Machaeranthera canescens	-	-	-	-	3	-	-	-	.00
F	Mertensia brevistyla	-	3	-	-	-	.03	-	-	-
F	Microsteris gracilis (a)	-	1	-	-	-	.00	-	-	-
F	Orthocarpus sp. (a)	-	-	7	-	-	-	.04	-	-
F	Osmorhiza occidentalis	37	25	27	19	33	.53	.28	.45	1.00

Type	Species	Nested Frequency					Average Cover %			
		'86	'94	'99	'04	'09	'94	'99	'04	'09
F	Phacelia hastata	$_{b}$23	$_{a}$4	$_{a}$-	$_{a}$-	$_{a}$-	.03	-	-	-
F	Phlox longifolia	3	-	-	-	-	-	-	-	-
F	Polygonum douglasii (a)	-	$_{b}$49	$_{ab}$15	$_{ab}$22	$_{a}$3	.11	.13	.03	.03
F	Potentilla gracilis	9	10	-	3	3	.18	-	.00	.03
F	Ranunculus sp.	$_{a}$-	$_{cd}$55	$_{b}$47	$_{ab}$22	$_{a}$29	.19	.30	.22	.13
F	Senecio neomexicanus	$_{a}$29	$_{b}$73	$_{b}$95	$_{a}$34	$_{b}$77	.64	.57	.33	1.17
F	Stellaria jamesiana	$_{a}$-	$_{c}$227	$_{bc}$204	$_{b}$150	$_{b}$132	2.57	2.82	2.61	1.72
F	Taraxacum officinale	$_{a}$168	$_{c}$215	$_{bc}$208	$_{a}$154	$_{ab}$166	3.09	5.08	3.71	5.23
F	Thermopsis montana	$_{a}$-	$_{b}$68	$_{a}$-	$_{a}$3	$_{a}$3	.51	-	.00	.38
F	Thlaspi montanum	$_{a}$22	$_{b}$62	$_{b}$73	$_{a}$21	$_{a}$12	.18	.35	.11	.03
F	Tragopogon dubius	$_{ab}$17	$_{ab}$16	$_{a}$7	$_{ab}$8	$_{b}$30	.66	.02	.45	.53
F	Unknown forb-annual (a)	-	-	-	-	2	-	-	-	.03
F	Unknown forb-perennial	$_{b}$96	$_{a}$-	$_{a}$-	$_{a}$-	$_{a}$9	-	-	-	.09
F	Valeriana occidentalis	7	5	-	-	-	.30	-	-	-
F	Veronica serpyllifolia	1	-	-	-	-	-	-	-	-
F	Vicia americana	$_{b}$145	$_{b}$165	$_{a}$98	$_{a}$90	$_{ab}$123	1.82	.64	2.29	5.18
F	Viola canadensis	-	4	6	8	5	.04	.01	.13	.18
Total for Annual Forbs		0	97	93	46	69	0.21	0.59	0.78	0.60
Total for Perennial Forbs		1098	1641	1574	1039	1227	23.70	27.76	28.76	44.14
Total for Forbs		1098	1738	1667	1085	1296	23.91	28.36	29.54	44.74

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

BROWSE TRENDS--
Management unit 14, Study no: 5

Type	Species	Strip Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
B	Abies concolor	0	0	2	1	-	-	.00	.38
B	Picea engelmannii	0	2	4	3	.03	.07	2.32	2.23
B	Populus tremuloides	0	19	22	12	.79	1.43	.81	2.35
B	Pseudotsuga menziesii	0	0	0	3	-	.01	.00	.63
B	Ribes sp.	0	0	1	1	-	-	.00	.38
B	Symphoricarpos oreophilus	2	5	3	4	.53	.42	.33	.36
Total for Browse		2	26	32	24	1.35	1.94	3.47	6.34

CANOPY COVER, LINE INTERCEPT--
Management unit 14, Study no: 5

Species	Percent Cover		
	'99	'04	'09
Abies concolor	-	-	.48
Picea engelmannii	-	3.45	6.28
Populus tremuloides	21.20	30.64	33.31
Pseudotsuga menziesii	-	-	.56
Symphoricarpos oreophilus	-	.11	-

BASIC COVER--
Management unit 14, Study no: 5

Cover Type	Average Cover %				
	'86	'94	'99	'04	'09
Vegetation	25.50	38.06	49.25	45.20	58.29
Rock	6.50	8.04	7.12	6.33	5.02
Pavement	1.75	.01	.44	1.03	.22
Litter	55.00	44.68	67.18	38.79	41.50
Cryptogams	0	.06	.64	.24	.19
Bare Ground	11.25	3.96	4.85	18.11	10.69

SOIL ANALYSIS DATA --
Management unit 14, Study no: 5, Study Name: Jackson Ridge

Effective rooting depth (in)	pH	clay loam			%0M	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
15.5	6	36.9	34.6	28.6	5.3	15.6	390.4	0.3

PELLET GROUP DATA--
Management unit 14, Study no: 5

Type	Quadrat Frequency			
	'94	'99	'04	'09
Moose	5	-	-	-
Elk	-	7	6	5
Deer	1	1	1	4
Cattle	-	-	-	-

Days use per acre (ha)		
'99	'04	'09
-	-	-
12 (30)	13 (33)	15 (36)
2 (5)	6 (15)	1 (3)
-	1 (2)	1 (2)

BROWSE CHARACTERISTICS--
Management unit 14, Study no: 5

		Age class distribution				Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Abies concolor									
86	**0**	0	0	-	-	0	0	0	-/-
94	**0**	0	0	-	-	0	0	0	-/-
99	**0**	0	0	-	-	0	0	0	-/-
04	**40**	100	0	-	-	0	0	0	-/-
09	**40**	100	0	-	-	0	0	0	-/-
Picea engelmannii									
86	**33**	100	0	0	-	0	0	0	-/-
94	**0**	0	0	0	-	0	0	0	-/-
99	**40**	100	0	0	80	0	0	0	-/-
04	**100**	80	20	0	20	0	0	0	-/-
09	**60**	33	33	33	20	0	0	33	-/-

		Age class distribution				Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Populus tremuloides									
86	**532**	81	6	12	333	25	25	44	393/300
94	**0**	0	0	0	-	0	0	0	-/-
99	**620**	23	77	0	-	0	0	0	-/-
04	**600**	57	43	0	-	0	3	3	-/-
09	**360**	11	89	0	160	0	0	0	-/-
Pseudotsuga menziesii									
86	**0**	0	0	-	-	0	0	0	-/-
94	**0**	0	0	-	-	0	0	0	-/-
99	**0**	0	0	-	180	0	0	0	-/-
04	**0**	0	0	-	180	0	0	0	-/-
09	**120**	100	0	-	180	0	0	0	-/-
Ribes sp.									
86	**0**	0	0	-	-	0	0	0	-/-
94	**0**	0	0	-	-	0	0	0	-/-
99	**0**	0	0	-	-	0	0	0	-/-
04	**20**	0	100	-	-	0	0	0	26/11
09	**20**	0	100	-	120	0	0	0	37/28
Sambucus racemosa									
86	**0**	0	0	-	-	0	0	0	-/-
94	**0**	0	0	-	-	0	0	0	-/-
99	**0**	0	0	-	-	0	0	0	-/-
04	**0**	0	0	-	-	0	0	0	13/13
09	**0**	0	0	-	-	0	0	0	-/-
Symphoricarpos oreophilus									
86	**33**	0	100	0	-	100	0	0	24/2
94	**60**	0	100	0	-	0	0	0	23/101
99	**240**	17	50	33	-	17	0	17	18/32
04	**360**	50	44	6	-	56	0	0	13/28
09	**180**	78	22	0	60	11	0	0	13/24