

CEDAR RIDGE - TREND STUDY NO. 11B-9-10

Vegetation Type: Black Sagebrush

Range Type: Crucial Deer Winter, Crucial Elk Winter

NRCS Ecological Site Description: Mountain Shallow Loam (Black Sagebrush)), R047XA438UT

Land Ownership: BLM

Elevation: 7543 ft. (2300 m)

Aspect: Northeast

Slope: 3%

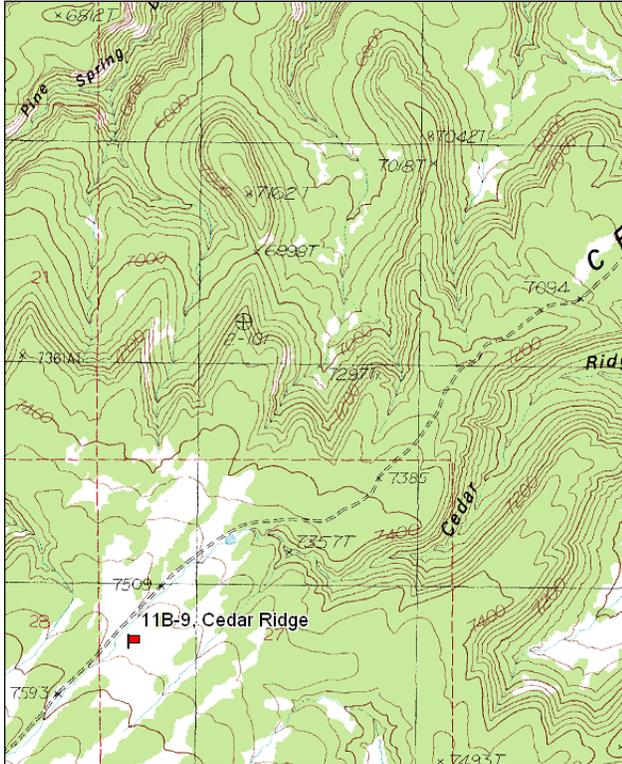
Transect bearing: 165° magnetic

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

Directions:

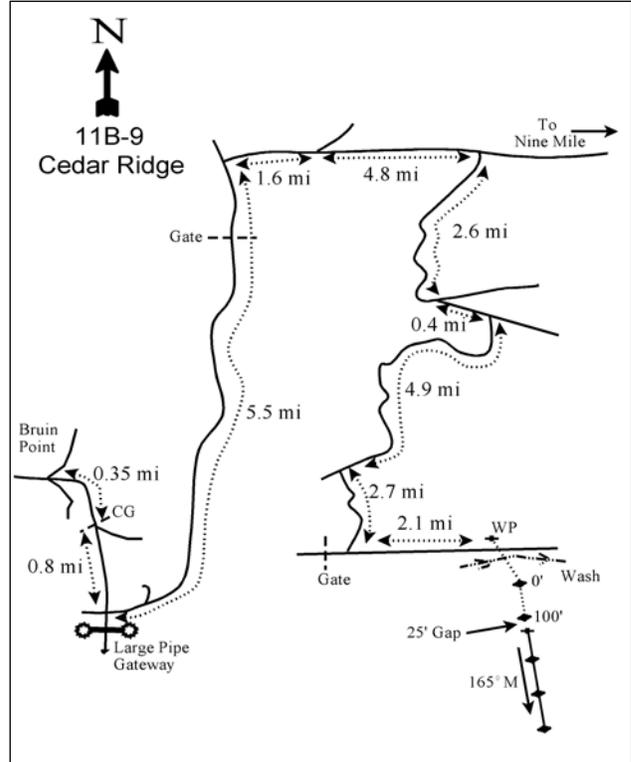
From Sunnyside, go up Water Canyon to the summit (Bruin Point). At the summit take the middle fork and go 0.35 miles. Stay right at the fork just beyond a cattle guard and go 0.9 miles. Turn left at the intersection just before the large pipe gateway and proceed 0.5 miles to a fork. Stay right and go 4.2 miles to a gate. Go 0.8 miles to a fork and remain right. Go 1.6 miles to another fork and remain right. Go 4.8 miles to another fork and turn right. Go 2.6 miles to another fork. Stay right and keep going 0.4 miles (passing Cottonwood 11B-7) to another fork. Stay on the main road (right) and go 4.8 miles to a junction. Turn left and go 2.7 miles to a "T" intersection. Turn left and go 2.1 miles to a witness post on the left side of the road. The transect starts 280 feet southeast of the witness post across the wash in the sage flat. There is a 25 foot break in the baseline between the end of line 1 and 2. The end of line 1 is marked by partially buried rebar. The rest of the stakes, including the witness post, are green fence posts.

Map Name: Twin Hollow



Township: 13S Range: 16E Section: 28

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 575634 E 4390909 N

CEDAR RIDGE - TREND STUDY NO. 11B-9

Site Information

Site Description: This study is located on the wide southwest portion of Cedar Ridge within an extensive black sagebrush (*Artemisia nova*) park about six miles east of the Green River. Cedar Ridge is an important concentration area for wintering mule deer, although much of the use occurs on the lower limits of the ridge. The area is basically level, but is dissected by numerous deep, intermittent drainages, which drain to the northeast. Grazing in the area is managed by the Bureau of Land Management (BLM) as part of the Green River allotment. The area is used by deer, elk, and a large number of wild horses with a well worn trail passing through the flat. Several deer antler drops were found in 1986. Both cattle and horse droppings were common in 1994, but significant use was not evident. There was also light elk sign observed in 1994. Pellet group data has estimated deer use to be light since 2000. Estimated elk use was moderate in 2000 and 2005, but was light in 2010. Estimated horse use was light in 2000 and 2010, but was more moderate in 2005. Sage grouse pellets were also sampled at low rates in 2000 and 2005 (Table - Pellet Group Data).

Browse: The dominant browse species is black sagebrush, which has provided the majority of the browse cover since 1994 (Table - Browse Trends). The black sagebrush is a very dense, mostly mature population with low decadence and light use. Recruitment of young plants has been good to excellent over the sample years. Other shrubs present include dwarf rabbitbrush (*Chrysothamnus depressus*), rubber rabbitbrush (*Chrysothamnus nauseosus*), broom snakeweed (*Gutierrezia sarothrae*) and gray horsebrush (*Tetradymia canescens*). These species make up only a small percent of the browse composition (Table - Browse Characteristics). This open sagebrush park is surrounded by pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) woodlands. Juniper appears to be slowly invading the flat, but is not common within the sample area. The surrounding pinyon-juniper stand provides good cover and still maintains a good shrub understory.

Herbaceous Understory: Grasses are diverse and are moderately abundant, providing valuable forage and excellent protective ground cover. The most abundant species of grass is needle-and-thread (*Stipa comata*) with other common grasses including bluebunch wheatgrass (*Agropyron spicatum*), mutton bluegrass (*Poa fendleriana*), Sandberg bluegrass (*P. secunda*) and prairie junegrass (*Koeleria cristata*). Forb composition is relatively diverse and abundant for this type of community. Common species include the low growing forbs littleleaf pussytoes (*Antennaria parvifolia*), sulfur eriogonum (*Eriogonum umbellatum*), mat penstemon (*Penstemon caespitosus*) and long-leaf phlox (*Phlox longifolia*) (Table - Herbaceous Trends).

Soil: The soil has a loam texture with a neutral soil reaction (pH 7.0). Phosphorus may have limited availability for plant growth and development at 5.3 ppm (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). The soil is fairly rocky, but there is little concentration of erosion, pavement, or rocks on the soil surface. Bare ground cover is moderately high, but litter and vegetation cover are evenly dispersed and appear to provide adequate soil protection (Table - Basic Cover). Some small rills are evident, with an old gully north of the transect, along the road. The soil erosion condition was classified as slight in 2005 due to moderate pedestaling around the shrubs and perennial grasses, but was stable in 2010.

Trend Assessments

Browse:

- **1986 to 1994 - slightly up (+1):** Differences in density may be related to the larger sample area used in 1994; therefore trend was determined using other parameters. Decadence of the primary browse species, black sagebrush, decreased from 24% to 5%. Recruitment of young plants increased slightly and young plants comprise half of the population.
- **1994 to 2000 - slightly up (+1):** The density of black sagebrush increased 10% from 22,840 plants/acre to 25,200 plants/acre, and cover increased from 12% to 21%. Recruitment of young plants decreased to 8% of the population, but is still considered good.

- **2000 to 2005 - slightly down (-1):** The black sagebrush appeared to be going through a period of self thinning with a large decrease in density to 15,740 plants/acre, but cover increased to 24%. Decadence of black sagebrush increased slightly to 11%, but is still considered low.
- **2005 to 2010 - slightly up (+1):** There was a 23% increase in the density of black sagebrush to 19,380 plants/acre due to a large increase in the recruitment of young plants. The density of mature black sagebrush remained similar and cover decreased slightly to 22%.

Grass:

- **1986 to 1994 - down (-2):** The sum of nested frequency of perennial grasses decreased by 26% with a significant decrease in the nested frequency of mutton bluegrass.
- **1994 to 2000 - stable (0):** There was little change in the sum of nested frequency of perennial grasses, though composition changed slightly with a significant decrease in needle-and-thread.
- **2000 to 2005 - up (+2):** The perennial grass sum of nested frequency increased by 23% with a significant increase in the nested frequency of prairie junegrass.
- **2005 to 2010 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 15% with a significant decrease in the nested frequency of Sandberg bluegrass.

Forb:

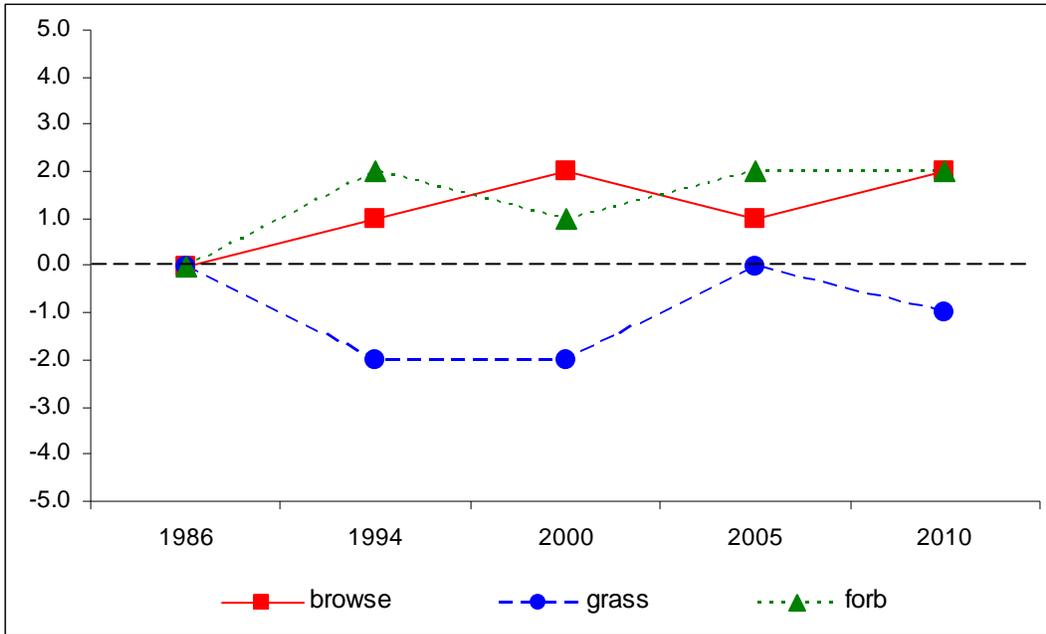
- **1986 to 1994 - up (+2):** The perennial forb sum of nested frequency increased by 34%.
- **1994 to 2000 - slightly down (-1):** The sum of nested frequency of perennial forbs decreased by 8%, and cover decreased slightly from 7% to 6%.
- **2000 to 2005 - slightly up (+1):** The sum of nested frequency of perennial forbs increased by 11% and cover increased to 7%.
- **2005 to 2010 - stable (0):** There was little change in the perennial forb sum of nested frequency, but cover decreased to 6%.

DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --
Management unit 11B, study no: 9

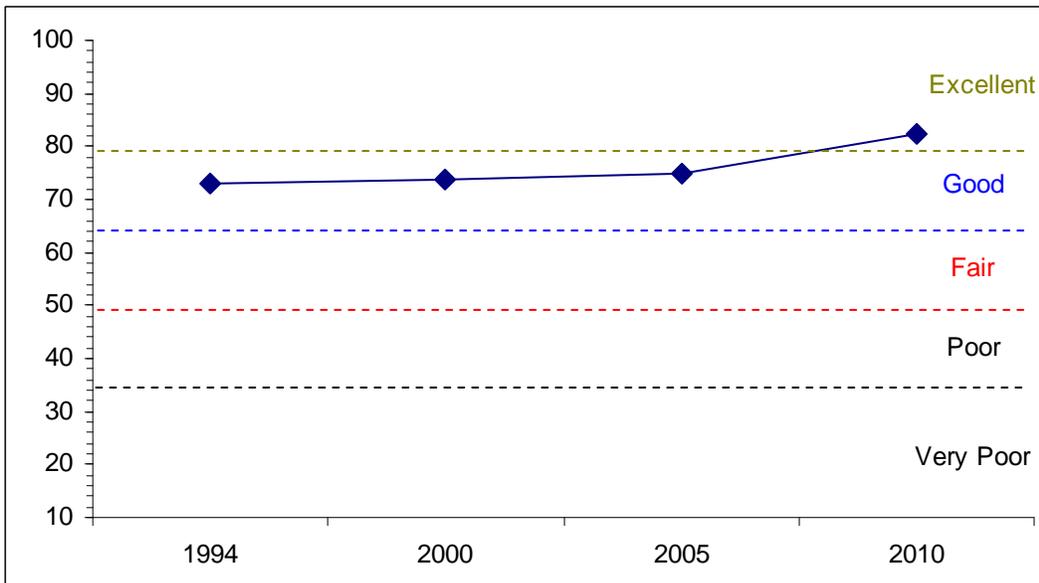
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
94	16	13.5	15	18.4	0	10	0	73	Good
00	27	12.7	3.9	20	0	10	0	73.6	Good
05	30	11.7	4	19.1	-0.1	10	0	74.7	Good
10	29.8	12.3	11.7	18.6	0	10	0	82.4	Excellent

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 11B, Study no: 9



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL--
Management unit 11B, Study no: 9



HERBACEOUS TRENDS--
Management unit 11B, Study no: 9

Type	Species	Nested Frequency					Average Cover %			
		'86	'94	'00	'05	'10	'94	'00	'05	'10
G	<i>Agropyron dasystachyum</i>	a10	a8	b66	a15	a20	.02	.81	.09	.24
G	<i>Agropyron spicatum</i>	66	49	61	40	59	.86	.51	1.25	1.13
G	<i>Bouteloua gracilis</i>	30	43	30	29	33	2.12	.91	.21	.50
G	<i>Bromus tectorum</i> (a)	-	a-	a2	b16	a-	-	.00	.09	-
G	<i>Koeleria cristata</i>	a-	b25	a-	c101	c107	.29	-	.85	1.87
G	<i>Oryzopsis hymenoides</i>	-	3	7	-	-	.00	.09	-	-
G	<i>Poa fendleriana</i>	c190	ab57	b87	a37	ab59	.43	2.38	.47	.53
G	<i>Poa secunda</i>	b70	a8	b92	b172	a67	.01	.62	1.83	.50
G	<i>Sitanion hystrix</i>	b40	ab21	a4	b33	ab18	.06	.03	.53	.31
G	<i>Stipa comata</i>	b246	b269	a160	a194	a164	5.36	4.62	4.27	4.19
Total for Annual Grasses		0	0	2	16	0	0	0.00	0.08	0
Total for Perennial Grasses		652	483	507	621	527	9.21	9.99	9.53	9.30
Total for Grasses		652	483	509	637	527	9.21	10.00	9.62	9.30
F	<i>Agoseris glauca</i>	-	-	3	1	3	-	.00	.03	.01
F	<i>Antennaria parvifolia</i>	ab65	b87	b98	a37	a31	2.59	2.63	.32	.68
F	<i>Arabis perennans</i>	ab10	a3	a-	b16	a3	.01	-	.07	.01
F	<i>Arenaria fendleri</i>	-	-	1	-	5	-	.00	-	.01
F	<i>Astragalus convallarius</i>	b12	a3	ab10	a-	a-	.00	.12	-	-
F	<i>Astragalus tenellus</i>	a-	ab12	b18	a-	b14	.03	.37	.00	.16
F	<i>Astragalus utahensis</i>	-	3	2	6	2	.00	.00	.01	.03
F	<i>Calochortus nuttallii</i>	a3	cd42	ab7	bc25	d64	.11	.01	.08	.26
F	<i>Castilleja flava</i>	-	-	9	4	3	-	.07	.03	.04
F	<i>Castilleja linariaefolia</i>	b23	a4	ab12	a1	a6	.03	.10	.00	.01
F	<i>Chenopodium fremontii</i> (a)	-	-	-	-	5	-	-	-	.09
F	<i>Cryptantha</i> sp.	ab23	ab18	b30	a12	ab22	.15	.28	.13	.43
F	<i>Delphinium nuttallianum</i>	b12	a-	ab2	ab5	a-	-	.01	.04	-
F	<i>Erigeron eatonii</i>	-	2	1	-	8	.03	.00	.00	.01
F	<i>Eriogonum alatum</i>	-	2	2	3	5	.03	.03	.00	.41
F	<i>Eriogonum umbellatum</i>	29	29	33	39	44	.28	.45	1.02	1.14
F	<i>Hedysarum boreale</i>	a-	b33	a11	ab25	ab15	.95	.07	1.50	.25
F	<i>Heterotheca villosa</i>	-	-	3	-	-	-	.00	-	-
F	<i>Ipomopsis aggregata</i>	-	-	3	-	-	-	.00	-	-
F	<i>Lappula occidentalis</i> (a)	-	a-	a-	b14	ab8	-	-	.03	.01
F	<i>Lesquerella</i> sp.	-	4	-	-	-	.03	-	-	-
F	<i>Linum lewisii</i>	-	-	2	5	7	-	.03	.02	.04
F	<i>Machaeranthera canescens</i>	-	3	5	7	4	.00	.01	.36	.04
F	<i>Machaeranthera grindelioides</i>	5	5	-	6	1	.01	-	.04	.03
F	<i>Penstemon caespitosus</i>	ab35	c70	abc47	a23	bc55	1.65	.92	.09	.85
F	<i>Penstemon strictus</i>	a6	a12	a11	a13	b42	.05	.03	.11	.43
F	<i>Phlox hoodii</i>	2	4	5	-	-	.03	.16	-	-
F	<i>Phlox longifolia</i>	ab60	a65	a57	b103	ab100	.21	.29	.64	.42
F	<i>Polygonum douglasii</i> (a)	-	a-	a-	b135	c175	-	-	.39	.51
F	<i>Sedum lanceolatum</i>	-	-	-	5	5	-	-	.01	.03

Type	Species	Nested Frequency					Average Cover %			
		'86	'94	'00	'05	'10	'94	'00	'05	'10
F	Senecio multilobatus	a ₄₆	a ₄₅	a ₅₀	b ₁₄₉	a ₂₀	.27	.30	2.41	.15
F	Sphaeralcea coccinea	a ₁₉	b ₆₂	a ₂₇	a ₁₉	a ₁₆	.50	.11	.09	.07
F	Townsendia incana	a ⁻	a ⁻	b ₁₆	a ⁻	a ₃	-	.05	-	.00
F	Tragopogon dubius	-	-	-	-	1	-	-	-	.00
F	Trifolium sp.	ab ₁₁	a ⁻	a ₆	ab ₁₈	b ₂₃	-	.02	.11	.10
F	Unknown forb-perennial	b ₂₀	a ⁻	a ⁻	a ⁻	a ⁻	-	-	-	-
F	Vicia sp.	-	1	-	-	-	.00	-	-	-
F	Zigadenus paniculatus	-	-	-	-	1	-	-	-	.00
Total for Annual Forbs		0	0	0	149	188	0	0	0.42	0.61
Total for Perennial Forbs		381	509	471	522	503	7.03	6.14	7.17	5.69
Total for Forbs		381	509	471	671	691	7.03	6.14	7.60	6.31

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

BROWSE TRENDS--

Management unit 11B, Study no: 9

Type	Species	Strip Frequency				Average Cover %			
		'94	'00	'05	'10	'94	'00	'05	'10
B	Amelanchier utahensis	0	0	1	1	-	-	.03	.15
B	Artemisia nova	100	100	100	100	11.60	20.80	23.76	21.50
B	Artemisia tridentata vaseyana	0	0	0	1	-	-	.15	.03
B	Chrysothamnus depressus	34	41	38	44	1.23	.81	1.75	2.15
B	Chrysothamnus viscidiflorus	2	0	2	2	-	-	-	-
B	Ephedra viridis	0	0	0	1	-	-	-	-
B	Gutierrezia sarothrae	16	10	16	10	.06	.01	.25	.16
B	Juniperus osteosperma	0	1	4	3	-	.18	1.00	.66
B	Opuntia sp.	2	0	0	0	.03	-	-	-
B	Pediocactus simpsonii	0	0	2	1	-	-	-	-
B	Pinus edulis	0	2	1	1	-	.03	.15	-
B	Tetradymia canescens	5	5	8	7	-	.03	-	-
Total for Browse		159	159	172	171	12.93	21.87	27.11	24.66

CANOPY COVER, LINE INTERCEPT--

Management unit 11B, Study no: 9

Species	Percent Cover		
	'00	'05	'10
Artemisia nova	-	25.63	27.11
Chrysothamnus depressus	-	1.63	2.41
Chrysothamnus viscidiflorus	-	.28	.25
Gutierrezia sarothrae	-	.10	.21
Juniperus osteosperma	.60	.96	1.46
Pinus edulis	.20	.28	.01
Tetradymia canescens	-	.15	-

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 11B, Study no: 9

Species	Average leader growth (in)	
	'05	'10
Artemisia nova	1.3	0.9

BASIC COVER--

Management unit 11B, Study no: 9

Cover Type	Average Cover %				
	'86	'94	'00	'05	'10
Vegetation	7.75	29.64	36.77	37.77	41.87
Rock	0	.58	.28	.59	.10
Pavement	.75	.28	1.68	.48	.79
Litter	44.50	25.51	43.31	36.57	43.83
Cryptogams	.75	.56	2.74	1.91	.25
Bare Ground	46.25	33.27	31.65	35.69	33.40

SOIL ANALYSIS DATA --

Management unit 11B, Study no: 9, Study Name: Cedar Ridge

Effective rooting depth (in)	pH	loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
12.9	7.0	47.3	32.2	20.6	2.4	5.3	243.2	0.7

PELLET GROUP DATA--

Management unit 11B, Study no: 9

Type	Quadrat Frequency			
	'94	'00	'05	'10
Rabbit	12	8	17	1
Grouse	-	-	-	-
Horse	12	3	11	7
Elk	5	20	19	9
Deer	9	4	10	13
Cattle	1	-	-	-

Days use per acre (ha)		
'00	'05	'10
-	-	-
9/acre	9/acre	-
16 (40)	30 (75)	13 (33)
29 (71)	38 (94)	12 (30)
-	17 (43)	19 (46)
-	1 (2)	-

BROWSE CHARACTERISTICS--
Management unit 11B, Study no: 9

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>Amelanchier utahensis</i>									
86	0	0	0	-	-	0	0	0	-/-
94	0	0	0	-	-	0	0	0	-/-
00	0	0	0	-	-	0	0	0	-/-
05	20	100	0	-	-	0	0	0	-/-
10	20	100	0	-	-	0	0	0	6/10
<i>Artemisia nova</i>									
86	5731	41	35	24	15799	42	7	0	17/17
94	22840	50	45	5	1920	6	.43	2	14/21
00	25200	8	84	8	4780	8	.55	4	9/15
05	15740	8	81	11	36900	3	0	3	13/19
10	19380	25	65	10	4080	17	17	8	9/18
<i>Artemisia tridentata vaseyana</i>									
86	0	0	0	-	-	0	0	0	-/-
94	0	0	0	-	-	0	0	0	-/-
00	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	-/-
10	20	0	100	-	-	0	0	0	14/22
<i>Chrysothamnus depressus</i>									
86	1331	30	65	5	-	0	0	0	4/7
94	3840	3	93	4	-	0	0	2	4/7
00	4400	5	93	2	40	0	0	2	3/8
05	4540	7	82	10	360	33	36	3	5/9
10	4020	2	97	0	40	7	0	.49	5/9
<i>Chrysothamnus nauseosus</i>									
86	0	0	0	-	-	0	0	0	-/-
94	0	0	0	-	-	0	0	0	19/24
00	0	0	0	-	-	0	0	0	20/21
05	0	0	0	-	-	0	0	0	23/26
10	0	0	0	-	-	0	0	0	30/44
<i>Chrysothamnus viscidiflorus</i>									
86	0	0	0	-	-	0	0	0	-/-
94	40	50	50	-	-	0	0	0	-/-
00	0	0	0	-	-	0	0	0	-/-
05	40	0	100	-	-	0	0	0	13/14
10	40	0	100	-	-	0	0	0	15/19

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Ephedra viridis										
86	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
00	0	0	0	-	-	0	0	0	-/-	
05	0	0	0	-	-	0	0	0	-/-	
10	20	100	0	-	-	0	0	0	-/-	
Gutierrezia sarothrae										
86	1532	22	74	4	66	0	0	0	6/4	
94	540	11	89	0	-	0	0	0	6/7	
00	300	13	87	0	-	0	0	0	4/4	
05	400	10	90	0	-	0	0	0	9/9	
10	320	13	88	0	-	0	0	0	8/9	
Juniperus osteosperma										
86	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
00	20	0	100	-	-	0	0	0	-/-	
05	80	100	0	-	-	0	0	0	-/-	
10	80	25	75	-	20	0	0	0	-/-	
Opuntia sp.										
86	0	0	0	-	-	0	0	0	-/-	
94	80	0	100	-	-	0	0	0	4/4	
00	0	0	0	-	-	0	0	0	-/-	
05	0	0	0	-	-	0	0	0	-/-	
10	0	0	0	-	-	0	0	0	-/-	
Pediocactus simpsonii										
86	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
00	0	0	0	-	-	0	0	0	-/-	
05	40	0	100	-	-	0	50	0	1/2	
10	20	0	100	-	-	0	0	0	3/6	
Pinus edulis										
86	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
00	40	50	50	-	-	0	0	0	-/-	
05	20	100	0	-	-	0	0	0	-/-	
10	20	0	100	-	-	0	0	0	-/-	
Tetradymia canescens										
86	133	0	100	0	-	100	0	0	11/11	
94	140	0	86	14	-	0	0	0	6/9	
00	120	17	50	33	-	33	0	0	5/7	
05	200	20	80	0	-	0	0	0	9/13	
10	180	0	100	0	-	0	0	0	7/10	