

KILGORE BASIN - TREND STUDY NO. 1-10-11

Vegetation Type: Black Sagebrush

Range Type: Crucial Deer Winter, Crucial Elk Year-long

NRCS Ecological Site Description: [Semidesert Gravelly Loam \(Wyoming Big Sagebrush\) North, R028AY215UT](#)

Land Ownership: BLM

Elevation: 5,330 ft. (1,625 m)

Aspect: Southwest

Slope: 5%

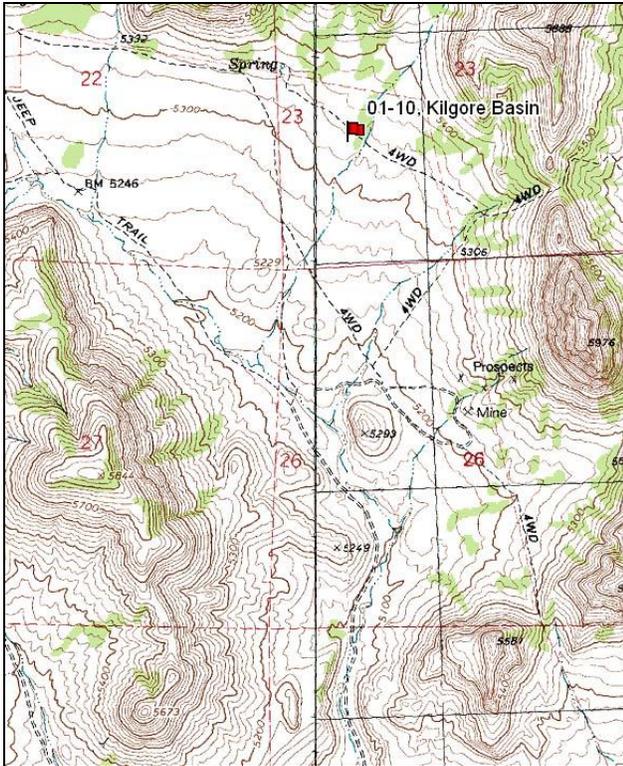
Transect bearing: 155° magnetic

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

Directions:

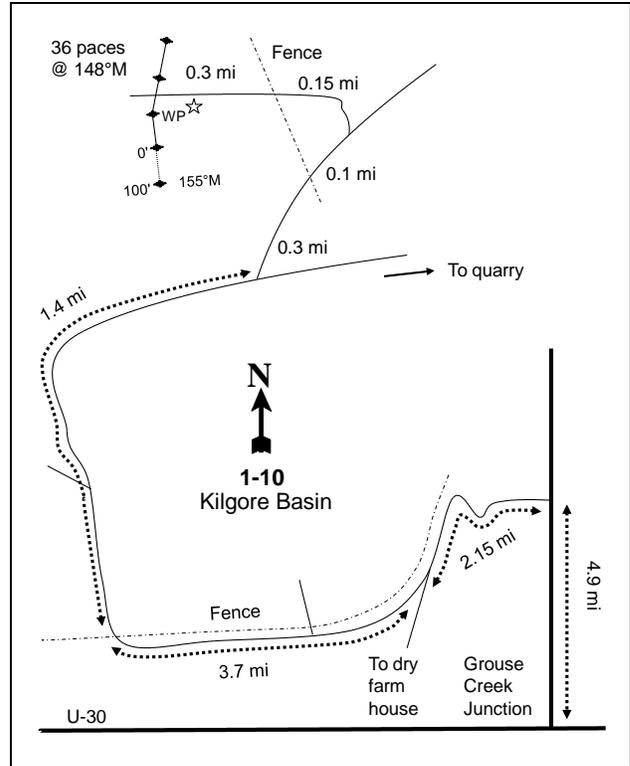
From the U-30/Grouse Creek Road junction, proceed north 4.9 miles on the Grouse Creek Road. Turn left (west) and travel 2.15 miles to a fork that leads to a dry farm. Stay on the main road at this fork (right) and continue 3.7 miles to a gate. Continue 1.2 miles to another fork. Stay right for 0.3 miles, then turn left and travel 0.4 miles to a gate. Proceed 0.1 miles to a fork. Turn left here into the P/J and go 0.15 miles to another gate. Continue 0.3 miles to a witness post on the south side of the road. Walk 36 paces from the witness post at a bearing of 148 degrees magnetic to the 0-foot stake of the frequency baseline. The 0-foot stake is marked by a red browse tag #7910. The baseline bearing is 155 degrees magnetic.

Map Name: Lucin NW



Township: 9N Range: 19W Section: 23

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 249603 E 4596725 N

## KILGORE BASIN - TREND STUDY NO. 1-10

### Site Information

Site Description: The study is located southwest of Grouse Creek within a large basin surrounded by low hills that are nearly barren of tree cover. The area is dominated by a uniform, low-growing, evenly spaced stand of black sagebrush (*Artemisia nova*). Shrub interspaces are essentially barren of other vegetation. Plant diversity is low within the basin. The only variation is in small swales where the deeper rooted Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and basin big sagebrush (*A. tridentata* ssp. *tridentata*) predominate, along with a few patches of Utah juniper (*Juniperus osteosperma*) trees. The area is managed by the Bureau of Land Management (BLM) as part of the Kilgore allotment. Deer pellet groups were sampled in moderate abundance in 2001, but in low abundance since 2006. Sampled cattle sign has been minimal since 2001 (Table - Pellet Group Data). Some sage-grouse droppings were noted in 2006, but none within the sample area.

Browse: Black sagebrush dominates the site, with scattered narrowleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *stenophyllus*), shadscale (*Atriplex confertifolia*), winterfat (*Ceratoides lanata*), and spiny hopsage (*Grayia spinosa*) occurring in limited abundance. Black sagebrush consists of a dense population of light to moderately used plants. Decadence of black sagebrush has been moderate since 1996. Poor vigor was low in 1996 and 2001, but was more moderate in the other sample years. Recruitment of young black sagebrush plants has been mostly good throughout the course of the study. Seedlings were very abundant in 2006 (Table - Browse Characteristics).

Herbaceous Understory: The herbaceous understory is sparse and has poor species diversity. Perennial grasses are rare, but include bottlebrush squirreltail (*Sitanion hystrix*), Sandberg bluegrass (*Poa secunda*), and Indian ricegrass (*Oryzopsis hymenoides*). The annual species cheatgrass (*Bromus tectorum*) and sixweeks fescue (*Vulpia octoflora*) have also been sampled. Cheatgrass was abundant in 2006, but has been rare in all other sample years. Forbs are also sparse on the site. Most forbs on the site are low-growing, xeric species with low palatability (Table - Herbaceous Trends).

Soil: The soil is in the Brobett-Plegomir association, which occurs on fan remnants. Parent material consists of alluvium derived from rhyolite, quartzite, sandstone, and quartzite (Soil Survey Staff 2011). The soil texture is a sandy clay loam with a moderately alkaline soil reaction (pH 8.1) (Table - Soil Analysis Data). The bulk of the ground surface is occupied by rock and erosion pavement. Apart from shrub crowns, there is very little herbaceous cover (Table - Basic Cover). Erosion continues at a slow but steady rate in spite of the gentle terrain. Plant pedestalling, exposed plant roots and exposed lichen lines on rocks are all common. The soil erosion condition was classified as stable in 2001 and 2011, but slight in 2006.

### Trend Assessments

#### Browse:

- **1984 to 1990 - stable (0):** There was little change in the density of black sagebrush. Decadence and poor vigor remain high within the population.
- **1990 to 1996 - slightly up (+1):** Differences in density may be related to the larger sample area used in 1996; therefore, trend was determined using other parameters. Decadence of black sagebrush decreased from 66% to 26%, and poor vigor decreased from 28% to 1%. Recruitment of young black sagebrush plants increased slightly from 9% of the population to 12%.
- **1996 to 2001 - slightly up (+1):** Density of black sagebrush increased by 17% from 13,600 plants/acre to 15,960 plants/acre, though cover decreased slightly from 25% to 21%. Decadence remained similar at 22%, and poor vigor increased slightly to 7%. Recruitment of young plants remained similar at 10% of the population.

- **2001 to 2006 - down (-2):** Black sagebrush density decreased by 20% to 12,700 plants/acre, but cover remained similar at 22%. Decadence increased slightly to 31%, and poor vigor increased to 21%. Recruitment of young plants decreased to 5% of the population, which is considered to be poor.
- **2006 to 2011 - stable (0):** There was no notable change in the density of black sagebrush at 12,640 plants/acre, but cover decreased slightly to 20%. Decadence decreased slightly to 25%, and poor vigor decreased slightly to 16%. Recruitment of young plants increased to 15% of the population.

Grass:

- **1984 to 1990 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 41%, but grasses were already rare on the site.
- **1990 to 1996 - up (+2):** The sum of nested frequency of perennial grasses increased two-fold due to a significant increase in the nested frequency of bottlebrush squirreltail and Sandberg bluegrass.
- **1996 to 2001 - stable (0):** There was little change in the sum of nested frequency of perennial grasses, though cover decreased from 2% to 1%.
- **2001 to 2006 - slightly down (-1):** The sum of nested frequency of perennial grasses and cover remained similar to the previous trend, but cheatgrass increased significantly in nested frequency. Cover of cheatgrass increased from less than 1% to 5%. Moreover, cheatgrass was the dominant species in both frequency and cover.
- **2006 to 2011 - slightly up (+1):** The sum of nested frequency of perennial grasses decreased by 11%, but cover increased to 2%. Cheatgrass decreased significantly in nested frequency, and cover decreased to less than 1%.

Forb:

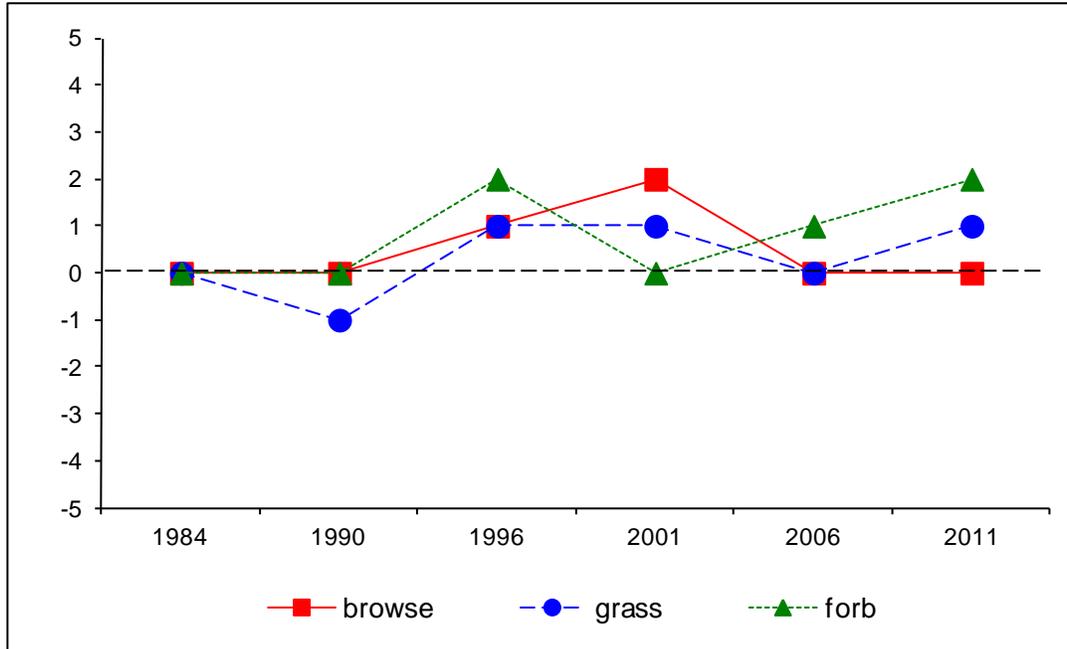
- **1984 to 1990 - stable (0):** There was little change in the sum of nested frequency of perennial forbs.
- **1990 to 1996 - up (+2):** The sum of nested frequency of perennial forbs increased by 50%.
- **1996 to 2001 - down (-2):** The sum of nested frequency of perennial forbs decreased by 55%, and cover decreased from 2% to less than 1%.
- **2001 to 2006 - slightly up (+1):** The sum of nested frequency of perennial forbs increased by 20%, and cover increased to 2%.
- **2006 to 2011 - slightly up (+1):** There was a 30% increase in the sum of nested frequency of perennial forbs, but cover remained similar at 2%. The sum of nested frequency of annual forbs also increased substantially, and cover increased from near 0% to 3%.

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 1, study no: 10

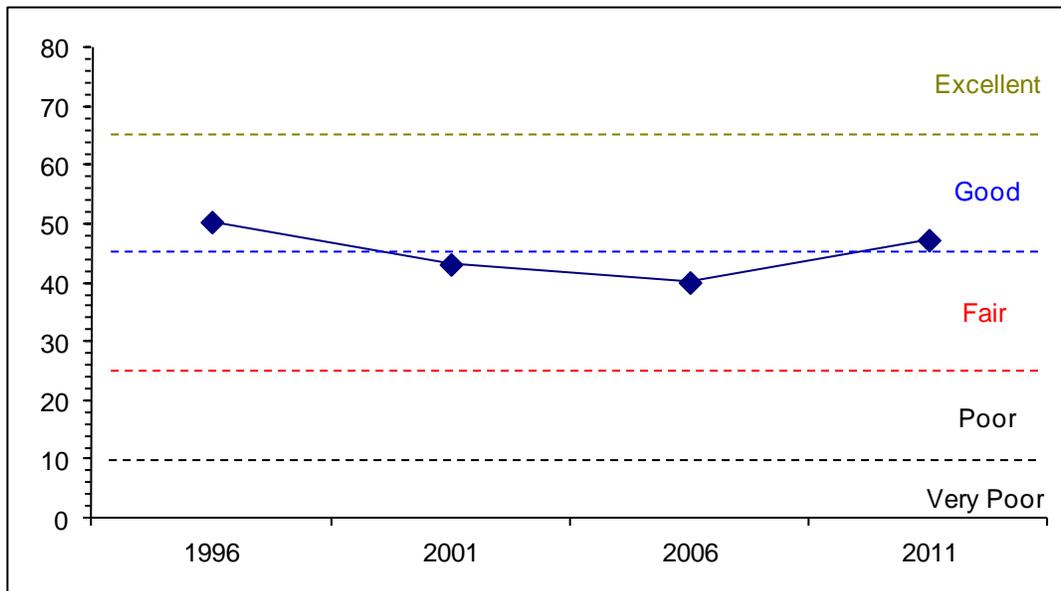
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
96	30.0	7.6	6.2	3.3	-0.2	3.5	0.0	<b>50.4</b>	Good
01	26.8	8.4	5.1	1.9	-0.4	1.3	0.0	<b>43.2</b>	Fair-Good
06	29.0	6.3	2.6	2.5	-3.5	3.1	0.0	<b>40.1</b>	Fair
11	25.4	7.5	7.6	3.8	-0.2	3.2	0.0	<b>47.3</b>	Good

## Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--  
 Management unit 1 Study no: 10



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--  
 Management unit 1, Study no: 10



HERBACEOUS TRENDS--  
Management unit 01, Study no: 10

Type	Species	Nested Frequency						Average Cover %			
		'84	'90	'96	'01	'06	'11	'96	'01	'06	'11
G	Bromus tectorum (a)	-	-	a53	a53	b256	a74	.20	.52	4.60	.28
G	Oryzopsis hymenoides	a2	a-	a5	a-	b23	a7	.31	-	.16	.21
G	Poa secunda	b10	a-	b22	b22	b19	c42	.30	.11	.12	.35
G	Sitanion hystrix	abc73	a50	bc89	c97	abc80	ab60	1.02	.86	.98	1.36
G	Vulpia octoflora (a)	-	-	-	4	9	-	-	.01	.01	-
Total for Annual Grasses		0	0	53	57	265	74	0.20	0.53	4.62	0.28
Total for Perennial Grasses		85	50	116	119	122	109	1.63	0.97	1.26	1.92
Total for Grasses		85	50	169	176	387	183	1.83	1.50	5.89	2.21
F	Allium sp.	a8	a-	a-	a-	a-	b12	-	-	-	.07
F	Arabis drummondii	b12	a-	a-	a1	a-	a-	-	.01	-	-
F	Astragalus beckwithii	a7	a1	b29	a-	a12	a13	.42	-	.12	.19
F	Astragalus utahensis	a-	a-	a-	a-	a5	b8	-	-	.04	.10
F	Collinsia parviflora (a)	-	-	a-	a-	a-	b28	-	-	-	.08
F	Cruciferae	a-	a-	b11	a-	a-	a-	.03	-	-	-
F	Cryptantha sp.	a-	a-	b20	a-	b8	b16	.05	-	.02	.03
F	Descurainia pinnata (a)	-	-	a-	a-	b14	b29	-	-	.03	.12
F	Eriogonum ovalifolium	a-	a-	a-	a-	a2	b9	-	-	.00	.05
F	Gilia sp. (a)	-	-	a9	a-	a7	b202	.03	-	.02	2.82
F	Lappula occidentalis (a)	-	-	a11	a-	a11	b80	.04	-	.03	.23
F	Navarretia intertexta (a)	-	-	ab19	a-	b23	a6	.04	-	.06	.03
F	Phlox hoodii	a51	b87	ab61	a46	a48	a48	.65	.38	1.06	.85
F	Phlox longifolia	bc80	ab57	c94	abc51	a43	ab47	.58	.25	.30	.27
F	Townsendia sp.	-	-	3	-	-	-	.03	-	-	-
Total for Annual Forbs		0	0	39	0	55	345	0.11	0	0.15	3.30
Total for Perennial Forbs		158	145	218	98	118	153	1.77	0.64	1.56	1.58
Total for Forbs		158	145	257	98	173	498	1.88	0.64	1.71	4.88

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

BROWSE TRENDS--

Management unit 01, Study no: 10

Type	Species	Strip Frequency				Average Cover %			
		'96	'01	'06	'11	'96	'01	'06	'11
B	Artemisia nova	100	100	100	100	24.95	21.25	21.95	19.63
B	Artemisia tridentata wyomingensis	3	1	0	3	.03	-	-	.03
B	Atriplex confertifolia	18	10	16	14	1.43	.22	1.51	.85
B	Ceratoides lanata	0	4	0	2	-	-	-	-
B	Chrysothamnus viscidiflorus stenophyllus	76	79	84	88	5.37	3.79	5.50	6.59
B	Ephedra nevadensis	2	1	1	1	.03	-	.03	.00
B	Grayia spinosa	3	3	2	2	.30	-	.15	.15
B	Juniperus osteosperma	1	1	1	1	.15	.03	.15	.15
B	Kochia americana	2	1	4	1	-	-	.00	-
B	Opuntia sp.	7	2	2	1	.00	-	.03	-
Total for Browse		212	202	210	213	32.27	25.30	29.33	27.42

CANOPY COVER, LINE INTERCEPT--

Management unit 01, Study no: 10

Species	Percent Cover	
	'06	'11
Artemisia nova	25.88	17.10
Artemisia tridentata wyomingensis	-	.31
Atriplex confertifolia	.70	.45
Chrysothamnus viscidiflorus stenophyllus	4.83	5.01
Grayia spinosa	.28	.45
Kochia americana	.15	-

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 01, Study no: 10

Species	Average leader growth (in)		
	'01	'06	'11
Artemisia nova	0.8	1.0	0.6
Atriplex confertifolia	-	2.8	0.9

BASIC COVER--

Management unit 01, Study no: 10

Cover Type	Average Cover %					
	'84	'90	'96	'01	'06	'11
Vegetation	0	5.50	36.16	30.06	33.62	34.40
Rock	11.00	6.75	11.82	4.40	5.07	4.84
Pavement	40.00	55.25	28.72	36.97	38.77	35.39
Litter	21.50	13.75	19.58	11.14	19.35	17.01
Cryptogams	1.50	1.50	1.84	.89	.98	1.10
Bare Ground	26.00	17.25	9.20	22.91	15.21	15.12

SOIL ANALYSIS DATA --

Management unit 01, Study no: 10, Study Name: Kilgore Basin

Effective rooting depth (in)	pH	Sandy-Clay-Loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
12.4	8.1	48.9	27.1	24.0	1.2	6.3	444.8	0.6

PELLET GROUP DATA--

Management unit 01, Study no: 10

Type	Quadrat Frequency				Days use per acre (ha)		
	'96	'01	'06	'11	'01	'06	'11
Rabbit	2	1	12	9	-	-	-
Elk	1	2	-	1	-	-	-
Deer	17	13	13	5	21 (51)	11 (26)	10 (25)
Cattle	1	2	6	3	5 (13)	14 (34)	8 (20)
Horse	-	-	-	-	-	-	1 (1)

BROWSE CHARACTERISTICS--

Management unit 01, Study no: 10

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Artemisia nova</b>									
84	<b>15931</b>	6	47	47	1799	0	93	32	12/21
90	<b>16199</b>	9	24	66	933	30	36	28	9/17
96	<b>13600</b>	12	61	26	560	54	12	1	8/20
01	<b>15960</b>	10	68	22	40	22	.25	7	9/20
06	<b>12700</b>	5	64	31	117660	6	.15	21	8/18
11	<b>12640</b>	15	60	25	300	22	0	16	8/19
<b>Artemisia spinescens</b>									
84	<b>0</b>	0	0	-	-	0	0	0	-/-
90	<b>0</b>	0	0	-	-	0	0	0	-/-
96	<b>0</b>	0	0	-	-	0	0	0	-/-
01	<b>0</b>	0	0	-	-	0	0	0	-/-
06	<b>0</b>	0	0	-	-	0	0	0	-/-
11	<b>0</b>	0	0	-	-	0	0	0	8/20
<b>Artemisia tridentata wyomingensis</b>									
84	<b>0</b>	0	0	0	-	0	0	0	-/-
90	<b>0</b>	0	0	0	-	0	0	0	-/-
96	<b>80</b>	0	25	75	-	0	75	0	19/23
01	<b>20</b>	0	100	0	-	0	0	0	26/45
06	<b>0</b>	0	0	0	-	0	0	0	18/43
11	<b>60</b>	33	67	0	-	67	0	0	16/29

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Atriplex confertifolia</i>										
84	1398	5	24	71	-	67	14	19	12/12	
90	1398	10	29	62	-	0	10	24	7/10	
96	740	19	78	3	40	43	8	0	10/14	
01	360	33	61	6	40	0	6	6	8/11	
06	560	7	93	0	20	4	0	0	9/14	
11	500	8	64	28	-	0	0	24	7/14	
<i>Ceratoides lanata</i>										
84	0	0	0	-	-	0	0	0	-/-	
90	0	0	0	-	-	0	0	0	-/-	
96	0	0	0	-	-	0	0	0	-/-	
01	120	33	67	-	20	0	0	0	3/3	
06	0	0	0	-	-	0	0	0	6/8	
11	80	25	75	-	-	75	0	0	3/5	
<i>Chrysothamnus viscidiflorus stenophyllus</i>										
84	3198	2	50	48	-	58	10	15	6/7	
90	3398	20	76	4	-	20	0	0	7/11	
96	4620	2	97	1	500	3	0	0	9/15	
01	4060	4	84	12	20	0	0	2	9/14	
06	4140	1	93	6	18020	0	0	.96	10/16	
11	5900	27	65	8	160	8	0	3	11/16	
<i>Ephedra nevadensis</i>										
84	0	0	0	0	-	0	0	0	-/-	
90	0	0	0	0	-	0	0	0	-/-	
96	60	0	67	33	-	33	67	0	9/13	
01	20	0	100	0	-	0	0	0	7/15	
06	60	100	0	0	-	0	100	0	12/16	
11	20	0	100	0	-	0	100	0	12/24	
<i>Grayia spinosa</i>										
84	66	0	100	0	-	0	100	100	16/4	
90	0	0	0	0	-	0	0	0	-/-	
96	100	0	40	60	-	100	0	60	15/33	
01	80	0	75	25	-	0	0	0	11/10	
06	60	0	100	0	-	0	0	0	14/26	
11	60	0	67	33	-	0	0	33	15/23	
<i>Juniperus osteosperma</i>										
84	0	0	0	-	-	0	0	0	-/-	
90	0	0	0	-	-	0	0	0	-/-	
96	20	100	0	-	-	0	0	0	-/-	
01	20	0	100	-	-	0	0	0	-/-	
06	20	100	0	-	-	0	0	0	-/-	
11	20	100	0	-	-	0	0	100	-/-	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Kochia americana</i>										
84	<b>0</b>	0	0	-	-	0	0	0	-/-	
90	<b>0</b>	0	0	-	-	0	0	0	-/-	
96	<b>40</b>	0	100	-	-	0	0	0	2/4	
01	<b>40</b>	0	100	-	-	0	0	0	2/7	
06	<b>140</b>	14	86	-	-	29	71	0	5/6	
11	<b>20</b>	0	100	-	-	0	0	0	7/9	
<i>Opuntia sp.</i>										
84	<b>66</b>	0	100	0	-	0	0	0	4/4	
90	<b>132</b>	50	50	0	-	0	0	0	3/4	
96	<b>140</b>	29	57	14	-	0	0	0	4/8	
01	<b>40</b>	100	0	0	-	0	0	0	-/-	
06	<b>40</b>	50	50	0	-	0	0	0	5/7	
11	<b>20</b>	0	100	0	20	0	0	0	4/8	
<i>Sarcobatus vermiculatus</i>										
84	<b>0</b>	0	0	-	-	0	0	0	-/-	
90	<b>0</b>	0	0	-	-	0	0	0	-/-	
96	<b>0</b>	0	0	-	-	0	0	0	-/-	
01	<b>0</b>	0	0	-	-	0	0	0	21/38	
06	<b>0</b>	0	0	-	-	0	0	0	39/54	
11	<b>0</b>	0	0	-	-	0	0	0	34/57	