

BUCKHORN DRAW - TREND STUDY NO. 13B-5-10

Vegetation Type: Desert Shrub

Range Type: Crucial Deer Winter, Crucial Elk Winter

NRCS Ecological Site Description: Not Available

Land Ownership: BLM

Elevation: 5050 ft. (1540 m)

Aspect: North

Slope: 4%

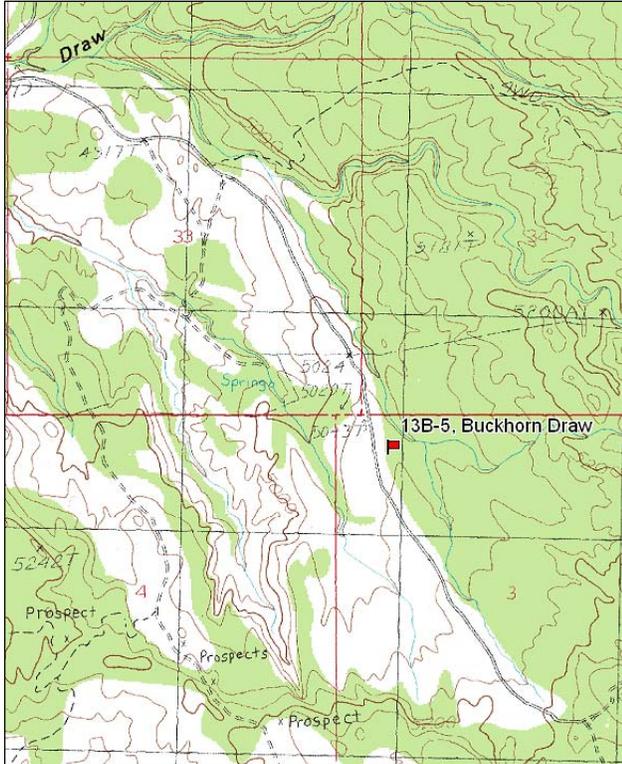
Transect bearing: 165° magnetic

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

Directions:

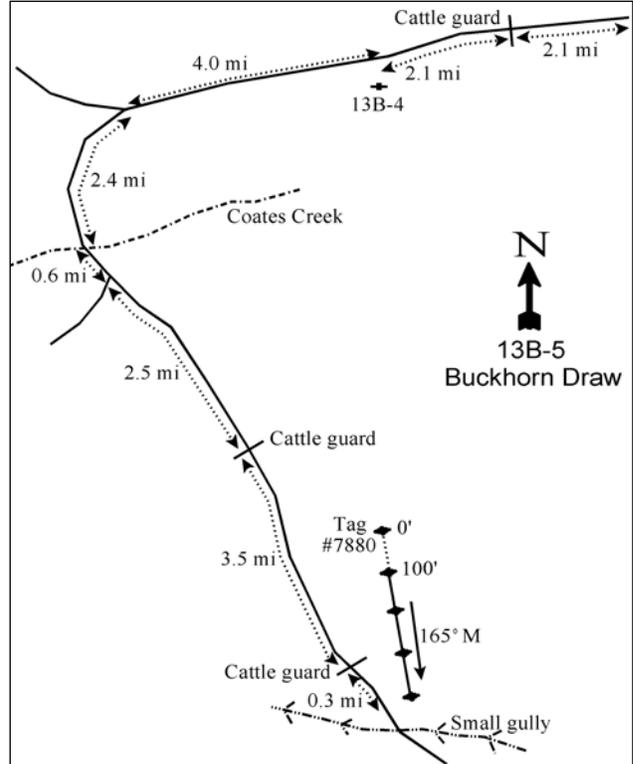
From the Utah-Colorado state line west of Glade Park travel 2.1 miles to a cattle guard. Continue west 2.1 miles to the Red Cliffs transect (13B-4). Continue west on the main road 4.0 miles to a fork. Stay left and go 2.4 miles to Coates Creek. Cross the creek and continue 0.6 miles to a fork. Stay left, go 2.5 miles to a cattle guard. Proceed 3.5 miles to another cattle guard. Go 0.3 miles past the cattle guard and stop. The transect is on the left (east) side of the road. The 0-foot end of the baseline (found 400 feet north) is also marked by a fence post, tagged #7880. All other plot markers are short rebar stakes.

Map Name: Blue Chief Mesa



Township: 23S Range: 25E Section: 3

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 660872 E 4300577 N

## BUCKHORN DRAW - TREND STUDY NO. 13B-5

### Site Information

Site Description: The study is located on an open bench in an area that supports a mixed desert shrub community dominated by broom snakeweed (*Gutierrezia sarothrae*), Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), spiny hopsage (*Grayia spinosa*), blackbrush (*Coleogyne ramosissima*) and some scattered Utah junipers (*Juniperus osteosperma*). Deep washes to the east and west intermittently carry water and drain to the north. Grazing in the area is managed by the Bureau of Land Management (BLM) as part of the Scharf Mesa allotment. The area is also used as winter range by deer and elk. In 1986, the BLM estimated use of sagebrush to be heavy (60%-80%), but much of this could have been cattle use because it is a winter cattle allotment. Pellet group data has indicated moderate deer use and light elk use since 2000. Estimated cattle use was moderate in 2000, light in 2005 and moderately heavy in 2010 (Table - Pellet Group Data).

Browse: The key browse species on the site are spiny hopsage and Wyoming big sagebrush. Spiny hopsage is the dominant browse species in cover (Table - Browse Trends). The spiny hopsage population has been mature with moderate to heavy hedging, high decadence, and minimal recruitment of young plants over the course of the study. In exceptionally dry years, spiny hopsage tends to lose its leaves, which makes it difficult to determine its true condition. The Wyoming big sagebrush population has been a mixture of young and mature plants with moderate to heavy browsing, fluctuating decadence and good vigor since the outset of the study in 1986. Both spiny hopsage and Wyoming big sagebrush had a marked decrease in density between the 2000 and 2005 sample years. Broom snakeweed was the most abundant browse species until 2005 when it also decreased substantially in density. Other less abundant shrubs include: green ephedra (*Ephedra viridis*) and blackbrush (Table - Browse Characteristics). Juniper trees are scattered throughout the area with low point-center quarter density estimates since 2000 (Table - Point-Quarter Tree Data).

Herbaceous Understory: Perennial grasses comprised primarily of sand dropseed (*Sporobolus cryptandrus*) and purple three-awn (*Aristida purpurea*) were prevalent on the site from 1986 to 2000, but there was a marked decrease in the sum of nested frequency and cover of perennial grasses in 2005. The annual grass cheatgrass (*Bromus tectorum*) increased substantially with the decrease of perennial grasses in 2005. Cheatgrass is now the dominant species on the site and provided nearly all of the total vegetation cover in 2005, and over half of the total vegetation cover in 2010. Forbs are not abundant on the site and the forbs that are present are comprised of annual species with storksbill (*Erodium cicutarium*) being the most prevalent (Table - Herbaceous Trends).

Soil: The soil is a fine sandy loam, well drained, deep with a mildly alkaline soil reaction (pH 7.6). There is a compacted layer of fine silty sand at about 12 inches with a noticeable accumulation of calcium carbonate. Phosphorus may have limited availability for plant growth and development at only 2.3 ppm (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). Percent bare ground has been moderate to high since 1986, with the highest bare ground in 2000 in correlation with a severe drought. Protective ground cover constituted an almost equal percent of vegetation and litter until 2005, when vegetation far exceeded litter. Most of the vegetation cover consisted of grasses, especially cheatgrass. No rock or pavement cover was encountered on the site, but there is good cryptogam cover (Table - Basic Cover). The gentle slope mitigates erosion from becoming excessive, although there is one small gully running southwest of the study site. The soil erosion condition was classified as slight in 2005 due to excessive pedestalling around shrubs and perennial grasses as well as some soil movement between perennial species, but was stable in 2010.

### Trend Assessments

Browse:

- **1986 to 1995 - slightly up (+1):** Differences in density may be related to the larger sample area used in 1995; therefore, trend was determined using other parameters. Decadence of the two primary

browse species, spiny hopsage and Wyoming big sagebrush, decreased from 100% to 32% and 40% to 12%, respectively. Recruitment of young sagebrush plants increased from 13% to 33%, though there was no new recruitment of spiny hopsage.

- **1995 to 2000 - stable (0):** The density and cover of both of the primary browse species increased slightly. Recruitment of young sagebrush plants decreased, but remained good at 13%, though there continued to be no new recruitment of hopsage. Decadence of spiny hopsage increased again to 88%.
- **2000 to 2005 - down (-2):** The density of Wyoming big sagebrush decreased by 43% from 1,160 plants/acre to 660 plants/acre, and the density of spiny hopsage decreased 20% from 1,020 plants/acre to 820 plants/acre, but cover of both species remained similar. Decadence of sagebrush increased to 39%, but the decadence of hopsage decreased to 49%. The density of the weedy species broom snakeweed also decreased substantially.
- **2005 to 2010 - slightly down (-1):** The density of Wyoming big sagebrush decreased 24% to 500 plants/acre and the density of spiny hopsage decreased 10% to 740 plants/acre, but cover of each species remained similar. Decadence of the two primary species also decreased to 12% in sagebrush and 5% in hopsage. Recruitment of young sagebrush plants increased to nearly half of the population, with no new recruitment of hopsage.

Grass:

- **1986 to 1995 - stable (0):** There was little change in the sum of nested frequency of perennial grasses.
- **1995 to 2000 - stable (0):** The sum of nested frequency of perennial grasses increased 9% and cover increased from 7% to 11%. Cheatgrass nested frequency decreased two degrees of significance and cover decreased from 4% to 3%.
- **2000 to 2005 - down (-2):** Perennial grass sum of nested frequency decreased by 87% and cover decreased to less than 1%. Perennial grasses became rare on the site. Cheatgrass nested frequency increased three levels of significance and cover increased to 39% and cheatgrass became the dominant species on the site.
- **2005 to 2010 - slightly up (+1):** The sum of nested frequency of perennial grasses increased three-fold, but perennial grasses are still not abundant. Cover of perennial grasses increased to near 4%. Cheatgrass nested frequency decreased two levels of significance and cover decreased to 19%, but cheatgrass remains the dominant species on the site.

Forb:

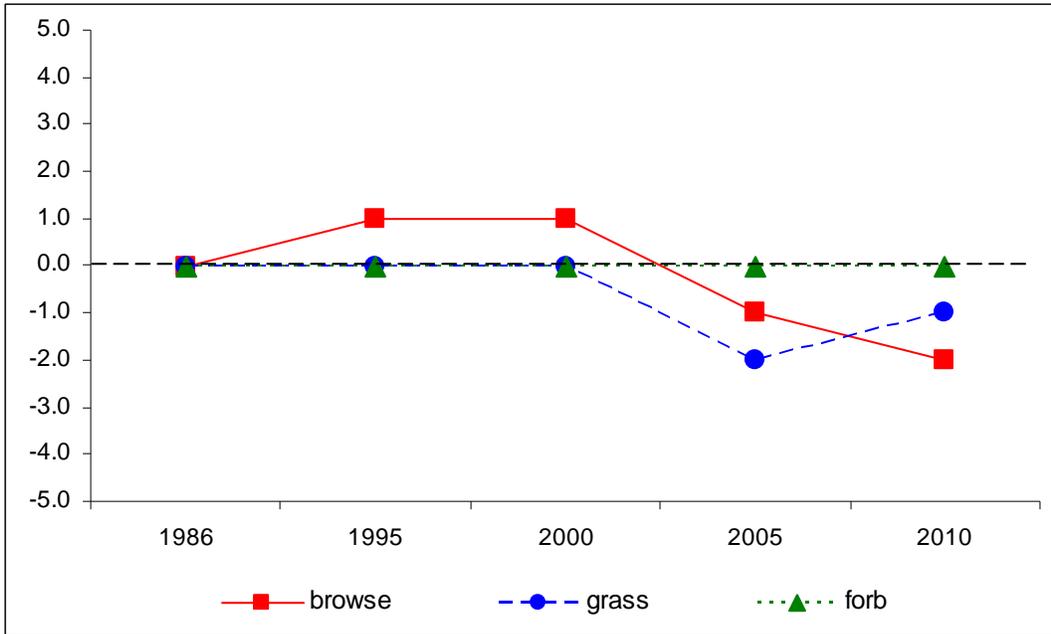
- **1986 to 1995 - stable (0):** There were few forbs sampled.
- **1995 to 2000 - stable (0):** There were few forbs sampled.
- **2000 to 2005 - stable (0):** There were few forbs sampled.
- **2005 to 2010 - stable (0):** There were few forbs sampled.

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 13B, study no: 5

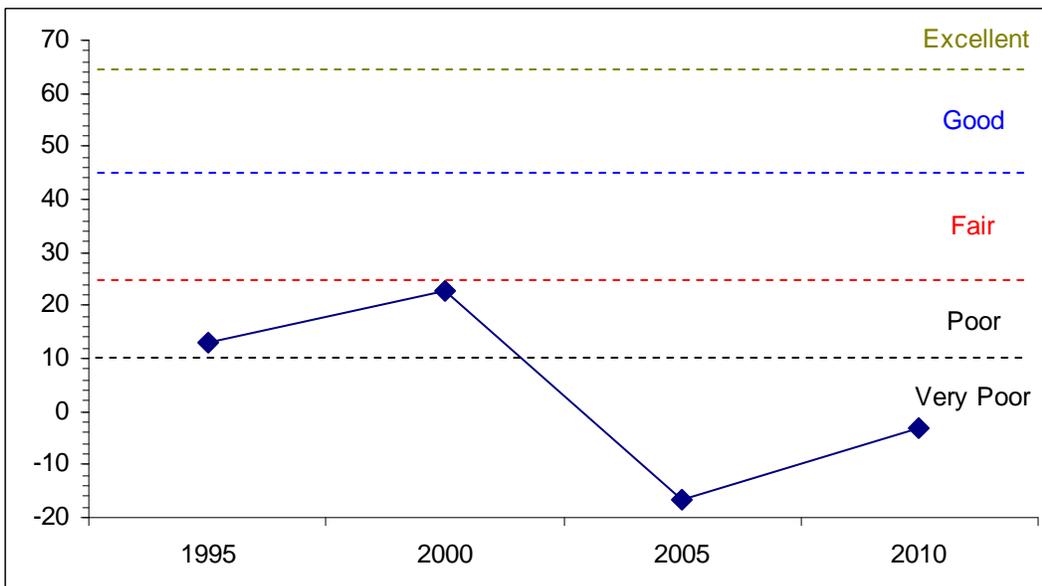
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
95	1.0	0.0	0.0	14.6	-3.1	0.4	0.0	<b>12.9</b>	Poor
00	3.7	0.0	0.0	20.9	-2.0	0.1	0.0	<b>22.6</b>	Poor
05	2.3	0.0	0.0	0.4	-20.0	0.5	0.0	<b>-16.8</b>	Very Poor
10	3.3	0.0	0.0	7.5	-14.6	0.7	0.0	<b>-3.0</b>	Very Poor

## Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--  
Management unit 13B, Study no: 5



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--  
Management unit 13B, Study no: 5



HERBACEOUS TRENDS--  
Management unit 13B, Study no: 5

T y p e	Species	Nested Frequency					Average Cover %			
		'86	'95	'00	'05	'10	'95	'00	'05	'10
G	<i>Aristida purpurea</i>	<sub>b</sub> 68	<sub>b</sub> 73	<sub>b</sub> 75	<sub>a</sub> -	<sub>a</sub> -	2.42	3.20	-	-
G	<i>Bromus tectorum</i> (a)	-	<sub>c</sub> 353	<sub>a</sub> 237	<sub>d</sub> 376	<sub>b</sub> 329	4.07	2.65	38.47	19.40
G	<i>Oryzopsis hymenoides</i>	<sub>ab</sub> 18	<sub>b</sub> 35	<sub>b</sub> 32	<sub>a</sub> 7	<sub>a</sub> 8	.20	.46	.03	.07
G	<i>Sporobolus cryptandrus</i>	<sub>c</sub> 156	<sub>bc</sub> 137	<sub>c</sub> 160	<sub>a</sub> 27	<sub>b</sub> 109	4.66	6.79	.17	3.68
G	<i>Vulpia octoflora</i> (a)	-	20	18	31	18	.04	.07	.06	.06
Total for Annual Grasses		0	373	255	407	347	4.11	2.72	38.53	19.46
Total for Perennial Grasses		242	245	267	34	117	7.28	10.46	0.20	3.75
Total for Grasses		242	618	522	441	464	11.40	13.18	38.73	23.21
F	<i>Calochortus nuttallii</i>	-	-	4	-	2	-	.00	-	.00
F	<i>Cryptantha</i> sp.	<sub>a</sub> -	<sub>b</sub> 24	<sub>a</sub> -	<sub>a</sub> 1	<sub>a</sub> 3	.05	-	.00	.01
F	<i>Cymopterus</i> sp.	<sub>a</sub> -	<sub>ab</sub> 6	<sub>b</sub> 14	<sub>c</sub> 35	<sub>bc</sub> 18	.01	.03	.07	.16
F	<i>Eriogonum</i> sp.	<sub>a</sub> -	<sub>b</sub> 15	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> -	.03	-	-	-
F	<i>Erodium cicutarium</i> (a)	-	<sub>a</sub> 5	<sub>b</sub> 12	<sub>b</sub> 16	<sub>c</sub> 74	.01	.03	.62	1.16
F	<i>Gilia</i> sp. (a)	-	-	3	-	8	-	.00	-	.02
F	<i>Lappula occidentalis</i> (a)	-	-	1	-	5	-	.00	-	.01
F	<i>Lepidium densiflorum</i> (a)	-	<sub>b</sub> 37	<sub>a</sub> 3	<sub>c</sub> 55	<sub>ab</sub> 14	.08	.00	.17	.03
F	<i>Lepidium</i> sp. (a)	-	-	-	-	4	-	-	-	.01
F	<i>Lygodesmia grandiflora</i>	-	7	3	3	-	.04	.00	.15	-
F	<i>Navarretia intertexta</i> (a)	-	-	-	1	-	-	-	.00	-
F	<i>Plantago patagonica</i> (a)	-	<sub>c</sub> 147	<sub>a</sub> 29	<sub>c</sub> 146	<sub>b</sub> 91	.32	.06	.46	.58
F	<i>Sphaeralcea coccinea</i>	-	<sub>b</sub> 19	<sub>a</sub> -	<sub>ab</sub> 3	<sub>ab</sub> 5	.06	-	.01	.02
F	<i>Sphaeralcea parvifolia</i>	-	-	-	-	6	-	-	-	.18
Total for Annual Forbs		0	189	48	218	196	0.41	0.10	1.27	1.83
Total for Perennial Forbs		0	71	21	42	34	0.19	0.04	0.23	0.37
Total for Forbs		0	260	69	260	230	0.61	0.15	1.51	2.20

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

BROWSE TRENDS--  
Management unit 13B, Study no: 5

T y p e	Species	Strip Frequency				Average Cover %			
		'95	'00	'05	'10	'95	'00	'05	'10
B	<i>Artemisia tridentata wyomingensis</i>	31	28	20	17	.82	1.63	1.04	1.90
B	<i>Coleogyne ramosissima</i>	3	5	6	5	-	1.63	1.01	.97
B	<i>Grayia spinosa</i>	33	28	27	29	3.76	4.67	3.93	4.26
B	<i>Gutierrezia sarothrae</i>	65	71	15	15	3.95	1.60	.37	.89
B	<i>Juniperus osteosperma</i>	0	0	0	0	-	-	-	.15
B	<i>Opuntia</i> sp.	4	8	8	8	.06	.33	.31	1.42
B	<i>Sclerocactus</i> sp.	0	1	0	0	-	-	-	-
Total for Browse		136	141	76	74	8.60	9.89	6.67	9.60

CANOPY COVER, LINE INTERCEPT--

Management unit 13B, Study no: 5

Species	Percent Cover	
	'05	'10
Artemisia tridentata wyomingensis	.30	.46
Coleogyne ramosissima	1.38	1.43
Grayia spinosa	3.61	4.88
Gutierrezia sarothrae	.08	.23
Opuntia sp.	.21	.73

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 13B, Study no: 5

Species	Average leader growth (in)	
	'05	'10
Artemisia tridentata wyomingensis	0.3	5.0
Coleogyne ramosissima	1.5	2.8
Grayia spinosa	3.5	7.7

POINT-QUARTER TREE DATA--

Management unit 13B, Study no: 5

Species	Trees per Acre				Average diameter (in)			
	'95	'00	'05	'10	'95	'00	'05	'10
Juniperus osteosperma	9	16	25	26	6.7	8.6	13.5	8.9

BASIC COVER--

Management unit 13B, Study no: 5

Cover Type	Average Cover %				
	'86	'95	'00	'05	'10
Vegetation	8.50	24.78	23.74	45.62	36.23
Rock	0	0	0	0	0
Pavement	0	0	.00	.00	0
Litter	42.00	25.71	24.92	20.39	38.65
Cryptogams	.75	2.11	5.05	9.43	8.72
Bare Ground	48.75	33.26	54.67	34.37	38.89

SOIL ANALYSIS DATA --

Management unit 13B, Study no: 5, Study Name: Buckhorn Draw

Effective rooting depth (in)	pH	sandy loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
18.9	7.6	64.0	18.0	18.0	0.3	2.3	99.2	0.6

PELLET GROUP DATA--

Management unit 13B, Study no: 5

Type	Quadrat Frequency				Days use per acre (ha)		
	'95	'00	'05	'10	'00	'05	'10
Rabbit	21	19	30	30	-	-	-
Elk	2	1	2	5	1 (2)	3 (8)	3 (7)
Deer	28	23	21	24	27 (67)	20 (50)	25 (63)
Cattle	5	9	23	12	20 (49)	6 (16)	46 (115)

BROWSE CHARACTERISTICS--  
Management unit 13B, Study no: 5

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>Artemisia tridentata wyomingensis</i>									
86	<b>498</b>	13	47	40	66	13	87	0	11/13
95	<b>1020</b>	33	55	12	200	47	6	8	16/24
00	<b>1160</b>	16	76	9	-	24	9	2	17/22
05	<b>660</b>	21	39	39	-	30	55	15	15/21
10	<b>500</b>	48	40	12	-	16	12	4	17/26
<i>Chrysothamnus nauseosus</i>									
86	<b>0</b>	0	0	-	-	0	0	0	-/-
95	<b>0</b>	0	0	-	-	0	0	0	-/-
00	<b>0</b>	0	0	-	-	0	0	0	6/14
05	<b>0</b>	0	0	-	-	0	0	0	-/-
10	<b>0</b>	0	0	-	-	0	0	0	16/22
<i>Chrysothamnus viscidiflorus stenophyllus</i>									
86	<b>0</b>	0	0	-	-	0	0	0	-/-
95	<b>0</b>	0	0	-	-	0	0	0	-/-
00	<b>0</b>	0	0	-	-	0	0	0	18/35
05	<b>0</b>	0	0	-	-	0	0	0	13/15
10	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Coleogyne ramosissima</i>									
86	<b>166</b>	0	100	-	-	0	100	0	15/31
95	<b>60</b>	33	67	-	-	33	0	0	27/50
00	<b>160</b>	25	75	-	-	0	0	0	21/36
05	<b>120</b>	17	83	-	-	17	0	0	19/38
10	<b>100</b>	20	80	-	-	20	0	0	20/44
<i>Ephedra viridis</i>									
86	<b>0</b>	0	0	-	-	0	0	0	-/-
95	<b>0</b>	0	0	-	-	0	0	0	27/27
00	<b>0</b>	0	0	-	-	0	0	0	-/-
05	<b>0</b>	0	0	-	-	0	0	0	25/31
10	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Grayia spinosa</i>									
86	<b>299</b>	0	0	100	-	0	100	100	-/-
95	<b>880</b>	0	68	32	-	66	16	27	17/33
00	<b>1020</b>	0	12	88	-	2	29	24	18/33
05	<b>820</b>	0	51	49	-	34	7	20	19/32
10	<b>740</b>	3	92	5	-	38	11	5	19/36

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>Gutierrezia sarothrae</i>									
86	<b>7765</b>	11	74	15	-	.85	.42	0	9/5
95	<b>3260</b>	18	82	0	100	0	0	0	11/15
00	<b>4060</b>	17	77	5	60	0	0	5	6/8
05	<b>440</b>	5	95	0	-	0	0	0	9/10
10	<b>420</b>	19	76	5	-	0	0	5	9/13
<i>Juniperus osteosperma</i>									
86	<b>33</b>	0	100	-	-	0	0	0	63/63
95	<b>0</b>	0	0	-	-	0	0	0	-/-
00	<b>0</b>	0	0	-	-	0	0	0	-/-
05	<b>0</b>	0	0	-	-	0	0	0	-/-
10	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Opuntia sp.</i>									
86	<b>66</b>	0	100	0	-	0	0	0	4/6
95	<b>120</b>	0	100	0	-	0	0	33	6/17
00	<b>220</b>	0	100	0	-	0	0	0	7/12
05	<b>200</b>	0	70	30	-	0	0	30	7/25
10	<b>200</b>	0	80	20	-	10	0	20	5/28
<i>Sclerocactus sp.</i>									
86	<b>0</b>	0	0	-	-	0	0	0	-/-
95	<b>0</b>	0	0	-	-	0	0	0	-/-
00	<b>20</b>	100	0	-	-	0	0	0	5/3
05	<b>0</b>	0	0	-	-	0	0	0	6/7
10	<b>0</b>	0	0	-	-	0	0	0	7/10