

SOUTH HORN 1/4 CORNER - TREND STUDY NO. 16C-25-09

Vegetation Type: Mountain Big Sagebrush

Range Type: Crucial Deer Winter, Substantial Elk Winter

NRCS Ecological Site Description: Not Available

Land Ownership: USFS

Elevation: 8,550 ft (2,606 m)

Aspect: Southwest

Slope: 5%

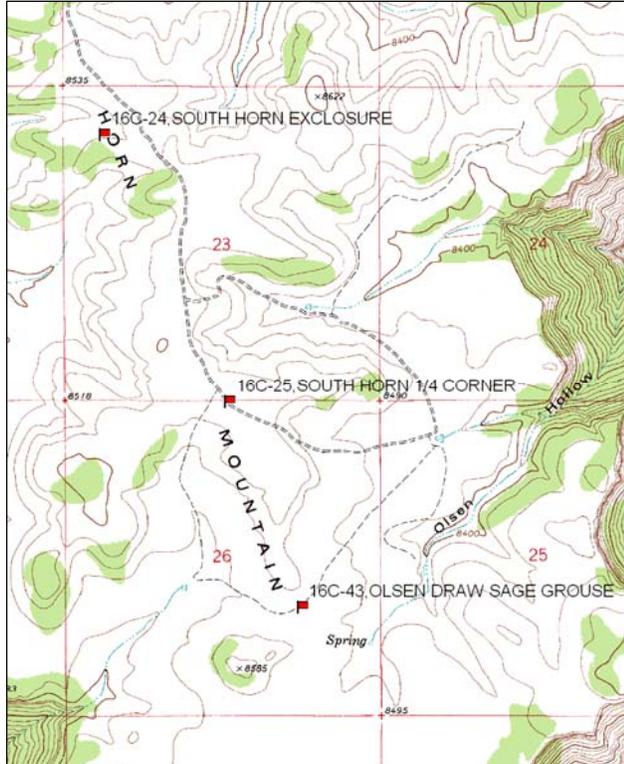
Transect bearing: 180 degrees magnetic.

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

Directions:

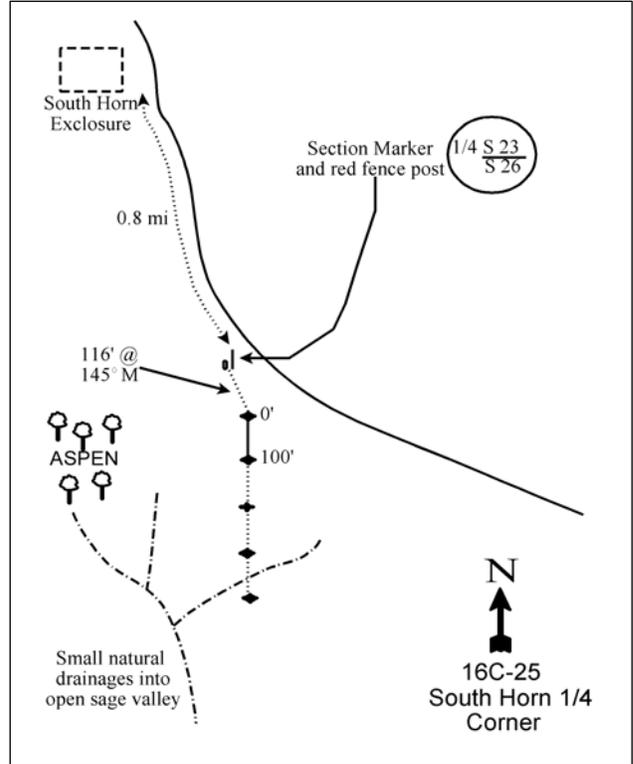
From the South Horn enclosure (by study #16C-24), continue south on the main USGS road for 0.8 miles to a USGS landline marker by a tall red fencepost on the right side of the road. This is the witness post for the transect. From the witness post walk SE (145°M) for 116 feet to the 0-foot end of the baseline. The 18" green fencepost is marked by browse tag #9011.

Map Name: The Cap



Township: 19S, Range: 6E, Section: 26

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 481335 E 4333044 N

SOUTH HORN 1/4 CORNER - TREND STUDY NO. 16C-25

Site Information

Site Description: The study samples an area of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and native perennial grass which is representative of a large expanse of open sagebrush slopes and flats on South Horn Mountain. On top of this large open plateau, the country is flat or gently rolling. Scattered clumps of pinyon pine (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), and Utah serviceberry (*Amelanchier utahensis*) offer cover and forage on and surrounding the study area, with a stand of aspen (*Populus tremuloides*) 300 yards to the west. The Forest Service manages the area as part of the Horn Mountain allotment. On this particular site, there is little sign of cattle because of limited water availability in the summer. Pellet group data estimated very heavy elk use in 1999 and 2004, but more moderate use in 2009. Estimated deer and cattle use has been light since 1999 (Table - Pellet Group Data). Cattle were on the site during the 2004 sample.

Browse: The dominant browse species is mountain big sagebrush, which provides the majority of the browse cover on the site (Table - Browse Trends). The mountain big sagebrush population is moderately dense and has had high amounts of decadence in the past, but decadence was low in 2009. Recruitment of young mountain big sagebrush plants has been very good over the sample years and over half the population was comprised of young plants in 2009. Utilization of mountain big sagebrush has been mostly moderate with some years of heavy use. Other preferred browse species on the site that occur in lower density and cover include Utah serviceberry, black sagebrush (*Artemisia nova*), winterfat (*Ceratoides lanata*), and dwarf rabbitbrush (*Chrysothamnus depressus*). Utilization of these species has been mostly moderate with some heavy use of serviceberry. Smaller shrubs and half-shrubs like prickly phlox (*Leptodactylon pungens*), stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*), and broom snakeweed (*Gutierrezia sarothrae*) are fairly common, but are in low densities and do not provide much cover or forage (Table - Browse Characteristics).

Herbaceous Understory: Grasses on the site are moderately abundant and diverse. Needle-and-thread (*Stipa comata*), and mutton and sandberg bluegrass (*Poa fendleriana* and *P. secunda*) are the most common species. These three species have provided almost all of the grass cover since 1994. Other species on the site include bottlebrush squirreltail (*Sitanion hystrix*), western wheatgrass (*Agropyron smithii*), and Indian ricegrass (*Oryzopsis hymenoides*). The forb population is very diverse and quite abundant, though no one species provides much cover. Common species on the site include tapertip hawksbeard (*Crepis acuminata*), hairy golden aster (*Heterotheca villosa*), penstemon (*Penstemon* spp.), and desert phlox (*Phlox austromontana*) (Table - Herbaceous Trends).

Soil: The soil texture is a sandy loam with a neutral pH. Phosphorus has limited availability for plant growth and development at just 2.5 ppm (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). Bare ground cover is moderately high, but there is good vegetation cover provided by the herbaceous understory on the site (Table - Basic Cover). The soil erosion condition was classified as slight in 2004 due to pedestaling, flow patterns, rills, and surface litter and soil movement, but was classified as stable in 2009.

Trend Assessments

Browse:

- **1988 to 1994 - slightly down (-1):** Differences in density may be related to the larger sample area used in 1994; therefore, trend was determined using other parameters. There was a slight increase in decadence of mountain big sagebrush from 45% to 54% and poor vigor increased markedly from 10% to 36%. Recruitment of young sagebrush plants decreased from 33% of the population to 7%.

- **1994 to 1999 - slightly up (+1):** The density of mountain big sagebrush increased 15% from 4,180 plants/acre to 4,840 plants/acre with a large increase in the recruitment of young plants to 21%. Decadence of mountain big sagebrush decreased to 13% and poor vigor decreased to 6%.
- **1999 to 2004 - down (-2):** Density of mountain big sagebrush decreased by 34% to 3,180 plants/acre. Decadence of mountain big sagebrush increased slightly to 25% and recruitment of young plants decreased slightly to 18%. There was also a large increase in the density and cover of the undesirable species broom snakeweed.
- **2004 to 2009 - up (+2):** The mountain big sagebrush density doubled to 6,360 plants/acre due to a substantial increase in the density of young plants. Cover of sagebrush changed little, however. Decadence of sagebrush decreased slightly, but poor vigor remained similar.

Grass:

- **1988 to 1994 - down (-2):** The sum of nested frequency of perennial grasses decreased by 44%. There was a change in composition with a significant decrease in the nested frequency of mutton bluegrass and a significant increase in Sandberg bluegrass.
- **1994 to 1999 - up (+2):** Perennial grass sum of nested frequency increased by 47% and cover increased from 8% to 12%. There was a significant decrease in the nested frequency of prairie junegrass (*Koeleria cristata*) and needle-and-thread.
- **1999 to 2004 - stable (0):** There was little change in the nested frequency of perennial grasses, though cover decreased to 10%. There was a significant increase in needle-and-thread and western wheatgrass.
- **2004 to 2009 - slightly up (+1):** There was a 15% increase in the sum of nested frequency, but cover remained similar. There was a significant decrease in the nested frequency of bottlebrush squirreltail and prairie junegrass.

Forb:

- **1988 to 1994 - down (-2):** The perennial forb sum of nested frequency decreased by 51% with a significant decrease in the nested frequency of many of the palatable forbs.
- **1994 to 1999 - stable (0):** There was little change in the sum of nested frequency of perennial forbs, though cover increased from 5% to 13%.
- **1999 to 2004 - down (-2):** The sum of nested frequency of perennial forbs decreased by 24% and cover decreased to 6%.
- **2004 to 2009 - stable (0):** There was little change in the sum of nested frequency or cover of perennial forbs.

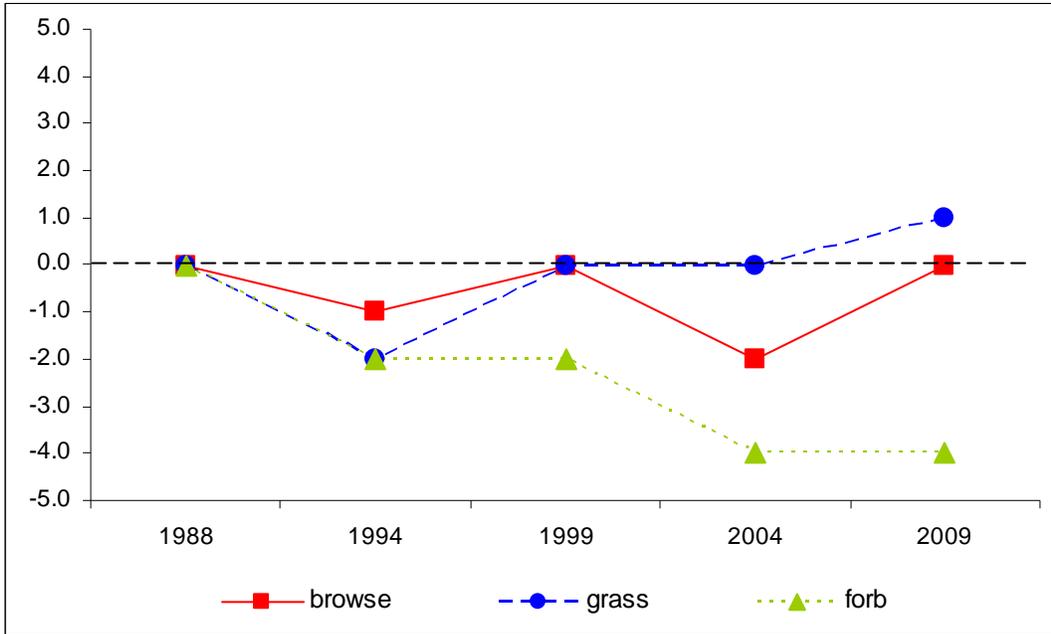
DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --

Management unit 16C, study no: 25

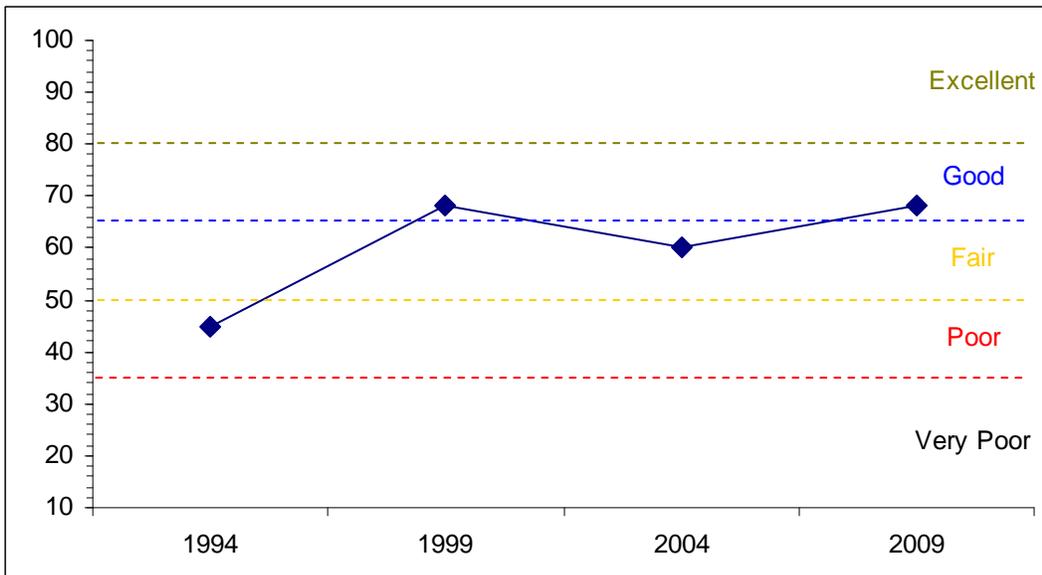
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
94	12.5	2.7	2.7	17.0	0.0	9.9	0.0	44.8	Poor
99	13.1	11.9	9.3	24.1	0.0	10.0	0.0	68.3	Good
04	14.1	8.8	6.9	20.5	0.0	10.0	0.0	60.3	Fair
09	12.8	10.4	15.0	20.1	0.0	10.0	0.0	68.2	Good

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
 Management unit 16C Study no: 25



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL
 Management unit 16C, Study no: 25



HERBACEOUS TRENDS--

Management unit 16C, Study no: 25

Type	Species	Nested Frequency					Average Cover %			
		'88	'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron smithii	a-	a-	a5	b39	b61	-	.03	.34	.31
G	Agropyron spicatum	-	-	-	7	1	-	-	.16	.03
G	Bouteloua gracilis	9	26	15	12	7	.39	.40	.15	.04
G	Carex sp.	a-	a-	b14	a-	a-	-	.42	-	-
G	Elymus salina	19	8	25	14	27	.33	.47	.10	.33
G	Koeleria cristata	c91	c66	b37	b17	a-	.42	.95	.10	-
G	Oryzopsis hymenoides	-	2	3	9	-	.00	.15	.16	-
G	Poa fendleriana	c254	b192	b190	a113	a118	3.29	6.55	1.98	1.80
G	Poa secunda	a64	c200	b131	ab94	c198	1.75	1.45	2.10	4.27
G	Sitanion hystrich	b52	b44	b51	b52	a4	.22	.64	.51	.03
G	Stipa comata	b143	b118	a53	b134	b150	2.07	.96	4.63	3.23
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		632	656	524	491	566	8.49	12.04	10.27	10.05
Total for Grasses		632	656	524	491	566	8.49	12.04	10.27	10.05
F	Allium sp.	b14	a-	a-	a-	a-	-	-	.00	-
F	Antennaria rosea	4	-	-	3	-	-	-	.00	-
F	Arabis sp.	b73	a12	a18	a18	a1	.03	.04	.05	.03
F	Aster sp.	a1	a-	a-	b19	a-	-	-	.19	-
F	Astragalus convallarius	-	5	6	7	3	.15	.18	.01	.00
F	Astragalus sp.	1	4	4	-	-	.03	.03	-	-
F	Castilleja chromosa	c183	b36	a-	a-	a-	.15	-	-	-
F	Castilleja linariaefolia	a3	a6	b22	a2	a6	.02	.62	.03	.03
F	Chenopodium sp. (a)	-	-	-	6	4	-	-	.01	.01
F	Cirsium calcareum	-	-	1	-	-	-	.03	-	-
F	Collinsia parviflora (a)	-	-	-	-	4	-	-	-	.01
F	Collomia linearis (a)	-	a-	a-	b126	a8	-	-	.44	.06
F	Comandra pallida	-	-	-	-	9	-	-	-	.07
F	Crepis acuminata	c169	b55	b64	b66	b19	.30	2.25	1.12	.18
F	Cryptantha sp.	c51	a7	a1	ab22	bc32	.04	.00	.20	.34
F	Delphinium nuttallianum	b14	b9	a-	a-	a-	.02	-	-	-
F	Draba sp. (a)	-	3	-	-	-	.00	-	-	-
F	Erigeron eatonii	b113	b113	b125	a32	a28	.80	1.80	.17	.21
F	Erigeron pumilus	a16	b48	a10	a12	a19	.18	.07	.06	.06
F	Eriogonum alatum	a-	b15	b17	b17	b23	.06	.18	.32	.23
F	Eriogonum racemosum	a19	b42	ab33	ab28	ab30	.19	.76	.45	.21
F	Eriogonum umbellatum	b166	a15	a28	a11	a35	.35	.61	.42	.52
F	Gilia sp. (a)	-	6	3	-	-	.01	.03	-	-
F	Heterotheca villosa	a-	a3	b36	b29	b25	.15	1.74	.81	.99
F	Lappula occidentalis (a)	-	-	-	4	-	-	-	.01	-
F	Linum lewisii	1	-	-	-	-	-	-	-	-
F	Lithospermum ruderales	8	1	2	3	-	.00	.00	.03	-
F	Lupinus sp.	-	-	-	2	4	-	-	.00	.09
F	Lygodesmia sp.	-	-	-	5	1	-	-	.06	.00

Type	Species	Nested Frequency					Average Cover %			
		'88	'94	'99	'04	'09	'94	'99	'04	'09
F	<i>Machaeranthera canescens</i>	-	-	-	-	-	-	-	.03	-
F	<i>Machaeranthera grindelioides</i>	ab22	b26	ab11	a-	a3	.09	.40	-	.04
F	<i>Oxytropis lambertii</i>	-	-	-	1	-	-	-	.00	-
F	<i>Penstemon comarrhenus</i>	a-	a-	b58	b33	b36	-	1.83	.32	.57
F	<i>Penstemon humilis</i>	b36	b37	a4	a14	ab16	.66	.15	.39	.11
F	<i>Phlox austromontana</i>	b121	ab74	b99	a61	ab80	1.49	2.34	.93	1.40
F	<i>Phlox longifolia</i>	-	1	-	-	-	.00	-	-	-
F	<i>Polygonum douglasii</i> (a)	-	a12	a6	b115	a10	.05	.01	.32	.01
F	<i>Potentilla gracilis</i>	-	-	7	1	6	-	.06	.03	.09
F	<i>Schoenocrambe linifolia</i>	-	-	3	-	-	-	.03	-	-
F	<i>Senecio integerrimus</i>	-	6	8	3	-	.04	.04	.03	-
F	<i>Senecio multilobatus</i>	b23	ab15	ab12	a7	a5	.03	.03	.05	.01
F	<i>Townsendia</i> sp.	2	-	-	-	-	-	-	-	-
F	<i>Trifolium</i> sp.	c75	ab21	a5	b36	ab21	.09	.01	.09	.05
F	<i>Zigadenus paniculatus</i>	b15	a-	a1	a3	a-	-	.00	.01	-
Total for Annual Forbs		0	21	9	251	26	0.07	0.04	0.78	0.09
Total for Perennial Forbs		1130	551	575	435	402	4.94	13.27	5.86	5.32
Total for Forbs		1130	572	584	686	428	5.01	13.31	6.65	5.42

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

BROWSE TRENDS--

Management unit 16C, Study no: 25

Type	Species	Strip Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
B	<i>Amelanchier utahensis</i>	5	2	0	2	1.18	.00	-	.03
B	<i>Artemisia frigida</i>	1	2	2	2	.00	.00	.03	.00
B	<i>Artemisia nova</i>	0	2	5	1	-	.30	.00	.00
B	<i>Artemisia tridentata vaseyana</i>	84	77	66	80	7.41	8.27	8.61	8.01
B	<i>Ceratoides lanata</i>	0	3	1	1	-	.00	.00	.00
B	<i>Chrysothamnus depressus</i>	50	49	47	56	1.20	1.92	2.67	2.16
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	31	28	25	34	.46	.60	1.05	.89
B	<i>Eriogonum corymbosum</i>	0	0	0	0	.03	-	-	-
B	<i>Gutierrezia sarothrae</i>	18	15	43	29	.21	.19	1.81	.83
B	<i>Leptodactylon pungens</i>	32	24	23	13	.51	.61	.42	.09
B	<i>Pediocactus simpsonii</i>	1	1	0	0	.00	.00	-	-
B	<i>Symphoricarpos oreophilus</i>	3	3	6	5	.15	.00	.00	.01
B	<i>Tetradymia canescens</i>	6	5	5	4	.03	.15	.18	.03
Total for Browse		231	211	223	227	11.23	12.06	14.80	12.07

CANOPY COVER, LINE INTERCEPT--

Management unit 16C, Study no: 25

Species	Percent Cover	
	'04	'09
Amelanchier utahensis	-	.43
Artemisia frigida	.06	-
Artemisia nova	.68	-
Artemisia tridentata vaseyana	9.44	9.00
Ceratoides lanata	-	.06
Chrysothamnus depressus	1.88	1.95
Chrysothamnus viscidiflorus viscidiflorus	1.21	.95
Gutierrezia sarothrae	1.08	.91
Leptodactylon pungens	.58	.05
Symphoricarpos oreophilus	.36	.38
Tetradymia canescens	.36	.13

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 16C, Study no: 25

Species	Average leader growth (in)	
	'04	'09
Amelanchier utahensis	6.6	1.0
Artemisia tridentata vaseyana	2.0	1.5

BASIC COVER--

Management unit 16C, Study no: 25

Cover Type	Average Cover %				
	'88	'94	'99	'04	'09
Vegetation	12.50	25.56	32.70	31.19	28.50
Rock	.25	.42	3.50	2.20	2.65
Pavement	1.50	.37	1.58	3.03	1.02
Litter	44.25	33.93	24.04	32.25	35.53
Cryptogams	4.00	2.63	3.77	2.83	1.52
Bare Ground	37.50	38.25	33.43	41.58	40.37

SOIL ANALYSIS DATA --

Management unit 16C, Study no: 25, Study Name: South Horn 1/4 Corner

Effective rooting depth (in)	pH	sandy loam			%0M	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
12.5	6.8	57.4	28.7	13.8	1.3	2.5	115.2	0.5

PELLET GROUP DATA--

Management unit 16C, Study no: 25

Type	Quadrat Frequency			
	'94	'99	'04	'09
Rabbit	23	14	4	29
Elk	38	34	48	59
Deer	6	19	4	3
Cattle	-	3	4	10

Days use per acre (ha)		
'99	'04	'09
-	-	-
71 (175)	84 (207)	26 (65)
9 (22)	5 (12)	7 (18)
3 (7)	9 (22)	-

BROWSE CHARACTERISTICS--
Management unit 16C, Study no: 25

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>									
88	0	0	0	-	-	0	0	0	-/-
94	180	0	100	-	-	11	0	0	27/36
99	40	0	100	-	-	50	50	0	36/45
04	0	0	0	-	-	0	0	0	34/50
09	40	50	50	-	-	0	0	0	37/45
<i>Artemisia frigida</i>									
88	0	0	0	-	133	0	0	0	-/-
94	20	0	100	-	-	0	0	0	5/7
99	40	0	100	-	-	0	0	0	9/9
04	40	0	100	-	-	50	0	0	7/12
09	40	0	100	-	-	0	0	0	-/-
<i>Artemisia nova</i>									
88	0	0	0	-	-	0	0	0	-/-
94	0	0	0	-	-	0	0	0	-/-
99	40	50	50	-	-	0	0	0	6/18
04	200	10	90	-	-	0	0	0	5/13
09	20	0	100	-	-	100	0	0	5/10
<i>Artemisia tridentata vaseyana</i>									
88	10132	33	22	45	133	33	14	10	10/13
94	4180	7	40	54	-	22	20	36	12/22
99	4840	21	67	13	60	30	65	6	16/25
04	3180	18	57	25	19420	45	18	11	19/31
09	6360	54	28	18	8740	14	23	13	15/28
<i>Ceratoides lanata</i>									
88	0	0	0	-	-	0	0	0	-/-
94	0	0	0	-	-	0	0	0	-/-
99	100	20	80	-	-	60	0	0	-/-
04	40	0	100	-	-	100	0	0	6/9
09	60	0	100	-	-	100	0	0	2/3
<i>Chrysothamnus depressus</i>									
88	4398	42	36	21	133	21	15	8	3/5
94	2500	1	98	2	-	11	2	0	3/7
99	3060	3	95	1	40	5	0	0	3/8
04	3660	0	93	7	-	7	5	1	4/9
09	5080	9	85	6	-	3	0	4	3/7

		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>Chrysothamnus viscidiflorus viscidiflorus</i>										
88	1665	76	24	0	-	12	20	0	6/6	
94	1200	2	98	0	-	15	0	0	5/8	
99	1260	5	95	0	-	0	0	0	6/9	
04	1040	0	100	0	-	0	0	0	8/13	
09	2060	0	98	2	160	0	2	3	6/9	
<i>Gutierrezia sarothrae</i>										
88	266	50	50	0	-	0	0	0	3/4	
94	580	0	100	0	-	0	0	0	4/6	
99	740	14	86	0	-	0	0	0	5/7	
04	2220	10	89	1	400	0	5	7	6/10	
09	1860	12	84	4	60	0	0	2	4/7	
<i>Leptodactylon pungens</i>										
88	9598	18	77	5	466	.69	0	1	4/4	
94	1380	1	96	3	-	0	0	0	3/6	
99	1320	9	91	0	20	0	0	0	4/5	
04	880	7	93	0	-	0	0	0	5/7	
09	580	7	93	0	-	0	0	0	3/5	
<i>Pediocactus simpsonii</i>										
88	0	0	0	-	-	0	0	0	-/-	
94	20	0	100	-	-	0	0	0	1/2	
99	20	0	100	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	1/3	
09	0	0	0	-	-	0	0	0	-/-	
<i>Purshia tridentata</i>										
88	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	-/-	
09	0	0	0	-	-	0	0	0	12/53	
<i>Symphoricarpos oreophilus</i>										
88	0	0	0	0	-	0	0	0	-/-	
94	80	0	50	50	-	25	0	25	13/28	
99	80	0	100	0	-	0	0	0	13/20	
04	160	13	63	25	-	0	0	0	7/10	
09	120	0	100	0	-	0	17	50	9/14	
<i>Tetradymia canescens</i>										
88	0	0	0	0	-	0	0	0	-/-	
94	180	22	78	0	-	22	0	0	4/6	
99	100	20	80	0	-	40	0	0	6/8	
04	120	17	67	17	-	17	17	17	6/10	
09	100	20	80	0	-	0	20	0	6/11	