

Trend Study 4-16-01

Study site name: Dry Hollow .

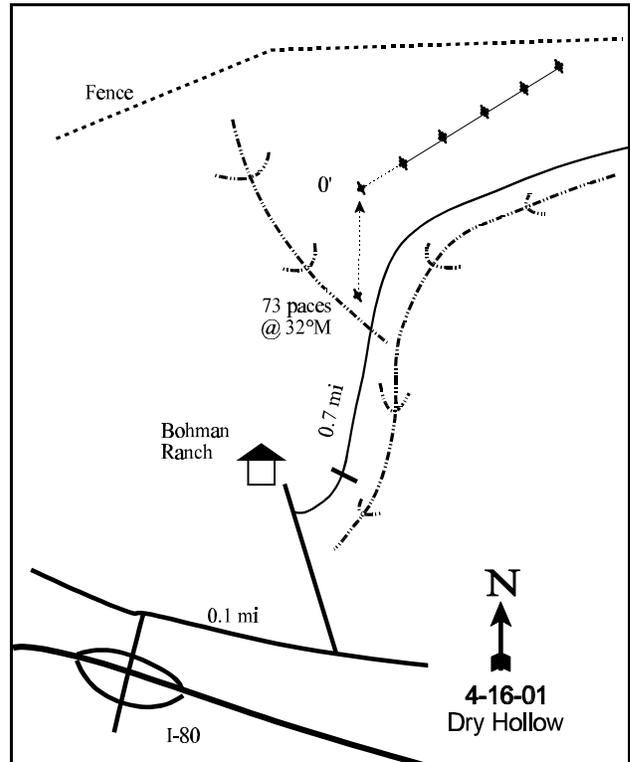
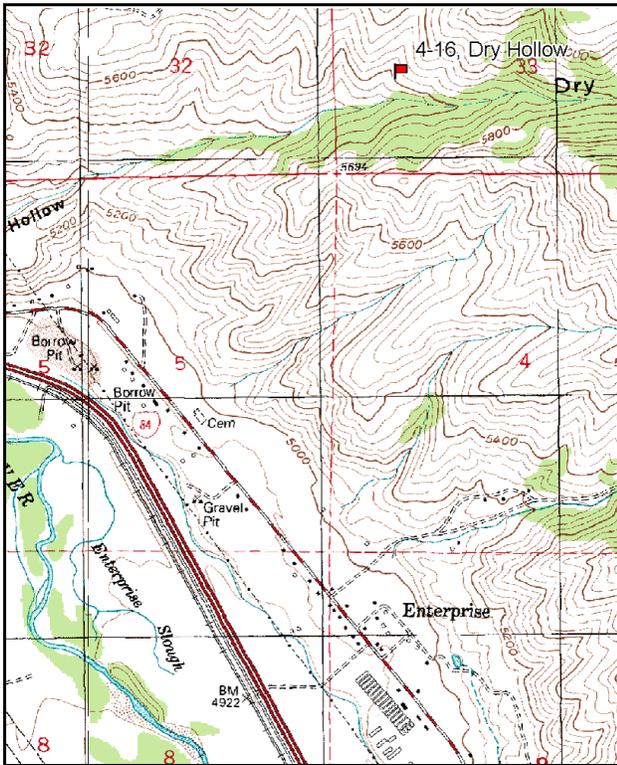
Vegetation type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 73 degrees magnetic.

Frequency belt placement: Line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

**LOCATION DESCRIPTION**

From I-84, take exit 96 and travel north to a “T” in the road. Turn right and travel 0.1 miles. Take a left toward Bohman Ranch. Just before Bohman Ranch turn right and travel toward a gate. From the gate, proceed 0.7 miles to a witness post. From the witness post walk 73 paces at 32 degrees magnetic to the 0 foot baseline stake. The baseline runs 73 degrees magnetic.



Map Name: Morgan

Diagrammatic Sketch

Township 5N, Range 2E, Section 33

UTM 4552328 N 438325 E

## DISCUSSION

### Trend Study No. 4-16

The Dry Hollow site was established in 1996, on private land owned by Frank Bohman. It is located about 1 mile east of the Bohman Ranch in Dry Hollow. The site is on a south facing hillside about 300 feet above the hollow within a sagebrush/grass type. Slope ranges from 9% to 20%. Aspect is southwest with an elevation of 5,440. Deer and elk have used this area during the winter in the past, but pellet groups have not been particularly abundant in 1996 or 2001. One large 4 point antler drop was found on the site in 1996. Cattle utilized the site in 1996, with this particular pasture being differed in 1997. A pellet group transect read on site in 2001, estimated only 3 deer days use/acre (8 ddu/ha). Cattle use was estimated at 13 days use/acre. Some cows were still in the area during the 2001 reading (6/7/01) but most use appears to have been in early spring.

The soil is shallow and rocky on the surface and throughout the profile along the first 100 feet of the baseline. Effective rooting depth (see methods) here is only 6 inches. Rock consist of rounded river cobble. Soil depth is deeper along the rest of the baseline with smaller gravel sized rocks on the surface and within the profile. Effective rooting depth along the rest of the baseline averages 15 inches. Average for the whole site is almost 14 inches. The soil is very dark, compact, but with good structure. It has a clay loam texture with a neutral soil reaction (pH of 7.3). Due to the rock and gravel on the surface and within the profile in association with the sloping south aspect, soil temperature is very high averaging 76°F at a depth of 16 inches. High soil temperatures cause the soil profile to dry early in the summer and give winter annuals, like cheatgrass and Japanese brome, a competitive advantage over the more preferred perennial species. Erosion is not currently a problem due to the abundant protective ground cover. The erosion condition class was determined as slight in 2001.

Browse on the site consists of a combination of low sagebrush (*Artemisia arbuscula*) and mountain big sagebrush (*A. tridentata vaseyana*). Low sagebrush grows primarily along the first part of the base line where rooting depth is more restricted. Other browse encountered on the site include bitterbrush, woods rose, Gambel oak, snowberry, and some chokecherry. Oak clones are growing near the site but were not sampled. Utilization of the sagebrush has been mostly light but some moderate use was encountered in 1996 and 2001. During the 1996 reading, poor vigor was apparent on mountain big sagebrush along belt 2 which is near the more shallow soil where low sagebrush dominates. Vigor was classified as poor on 24% of the mountain big sagebrush population in 1996. However, percent decadence was only 6%. During the 2001 reading, percent decadence increased slightly for both low sagebrush and mountain big sagebrush. Average vigor improved for mountain big sagebrush and slightly declined for low sagebrush. Recruitment is good for both species with adequate young plants to maintain their respective populations.

Less desirable shrubs include stickyleaf low rabbitbrush, broom snakeweed, Oregon holly grape, and woods rose, which are found on the site in limited numbers. However, all have increased in density since 1996.

Understory vegetation, like many south slopes in this area, is composed mostly of weedy perennial forbs and annual grasses. Japanese brome and cheatgrass accounted for 97% of the grass cover in 1996. The only perennial grasses found on the site consist of occasional bluebunch wheatgrass and a slightly more abundant Sandberg bluegrass. In 2001, annual grasses continue to dominate the grass component even though cheatgrass has increased and Japanese brome declined abundance. Combined, these annual grasses still account for 77% of the grass cover.

Forbs are abundant but they are composed mostly of annual and weedy biennial and perennial species. The most abundant species include pale alyssum, Louisiana sage, aster, storksbill, prickly lettuce, and yellow salsify. Annual forbs were particularly abundant in 2001, increasing from 3% cover in 1996 to 26% in the last survey.

#### 1996 APPARENT TREND ASSESSMENT

Soil trend appears stable due to the abundant protective ground cover and little exposed bare ground. Trend for browse appears stable with light to moderate utilization, generally good vigor, adequate numbers of young plants, and low decadency rates. The herbaceous understory is poor and contains few valuable species, mostly weeds and annuals.

#### 2001 TREND ASSESSMENT

Trend for soil is down slightly. Percent bare ground nearly doubled, but it is still relatively low at 11%. Litter cover also declined considerably because of the extremely dry conditions. However, herbaceous vegetation is still abundant and the erosion is not a significant factor at this time. The erosion condition class was determined as slight. Trend for the key browse species, low sagebrush and mountain big sagebrush, is up slightly. Density for both populations has increased slightly, percent decadence remains relatively low, vigor is generally good, and young recruitment has improved. Trend for the herbaceous understory is mixed for perennials. Sum of nested frequency for perennial grasses has increased slightly with a significant increase in the nested frequency of bluebunch wheatgrass and Sandberg bluegrass. However, perennial grasses are not abundant and provide only 23% of the grass cover. Annual grasses continue to dominate the grass component by providing the other 77% of the grass cover. The annual grass composition has changed somewhat since 1996 with cheatgrass increasing significantly in nested frequency, while Japanese brome declined significantly. The herbaceous understory composition has also changed in that forbs now contribute 75% of the total herbaceous cover, an increase from 42% in 1996. The increase comes entirely from annual forbs which rose in average cover from 3% in 1996 to 26% in 2001. The biggest increase comes from storksbill which expanded from about one-half of 1% cover in 1996 to 23% cover in 2001. Perennial forbs have declined slightly in sum of nested frequency, but average cover has remained stable at about 10%. These changes are obviously driven by precipitation which was only 47% of normal in March at Morgan (Utah climate summaries 2001). April was normal but May was extremely dry averaging only 8% of normal. Trend for the herbaceous understory is stable for perennial species, although due to the significant increase in annual forbs, trend is considered slightly down.

#### TREND ASSESSMENT

soil - down slightly (2)

browse - up slightly (4)

herbaceous understory - down slightly (2)

HERBACEOUS TRENDS --

Herd unit 04 , Study no: 16

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'96	'01	'96	'01	'96	'01
G	<i>Agropyron cristatum</i>	-	1	-	1	-	.03
G	<i>Agropyron intermedium</i>	-	1	-	1	-	.03
G	<i>Agropyron spicatum</i>	5	*26	3	11	.04	.98
G	<i>Bromus brizaeformis</i> (a)	2	3	1	1	.00	.03
G	<i>Bromus japonicus</i> (a)	349	*212	85	68	11.68	1.27
G	<i>Bromus tectorum</i> (a)	221	*379	56	97	5.80	8.05
G	<i>Elymus salina</i>	-	3	-	1	-	.03
G	<i>Poa bulbosa</i>	-	7	-	2	-	.38
G	<i>Poa secunda</i>	26	*79	12	31	.45	1.33
Total for Annual Grasses		572	594	142	166	17.50	9.36
Total for Perennial Grasses		31	117	15	47	0.49	2.79
Total for Grasses		603	711	157	213	17.99	12.15
F	<i>Achillea millefolium</i>	22	25	12	11	.25	.20
F	<i>Agoseris heterophylla</i>	64	34	24	17	.44	.38
F	<i>Alyssum alyssoides</i> (a)	68	*185	22	57	.31	1.17
F	<i>Allium</i> spp.	9	*45	4	19	.02	.22
F	<i>Ambrosia psilostachya</i>	13	*33	5	13	.11	.49
F	<i>Antennaria parvifolia</i>	-	3	-	1	-	.03
F	<i>Artemisia ludoviciana</i>	63	*80	25	32	1.37	1.18
F	<i>Aster</i> spp.	33	46	10	15	.87	1.12
F	<i>Astragalus</i> spp.	-	1	-	1	-	.00
F	<i>Balsamorhiza sagittata</i>	3	-	1	-	.36	.06
F	<i>Camelina microcarpa</i> (a)	14	6	6	2	.03	.16
F	<i>Calochortus nuttallii</i>	-	-	-	-	-	.00
F	<i>Cirsium undulatum</i>	4	4	2	2	.03	.15
F	<i>Collomia linearis</i> (a)	3	9	1	6	.00	.03
F	<i>Collinsia parviflora</i> (a)	-	*24	-	9	-	.09
F	<i>Draba</i> spp. (a)	-	7	-	3	-	.01
F	<i>Epilobium brachycarpum</i> (a)	-	*104	-	35	-	.49
F	<i>Erodium cicutarium</i> (a)	76	*381	26	88	.43	22.90
F	<i>Erigeron divergens</i>	-	3	-	1	-	.15
F	<i>Galium</i> spp.	4	*20	2	8	.01	.72
F	<i>Gayophytum ramosissimum</i> (a)	167	*7	63	3	1.10	.01
F	<i>Grindelia squarrosa</i>	5	*25	3	11	.21	.25

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'96	'01	'96	'01	'96	'01
F	<i>Helianthus annuus</i> (a)	18	*75	7	29	.22	.61
F	<i>Hedysarum boreale</i>	-	5	-	1	-	.00
F	<i>Holosteum umbellatum</i> (a)	70	*31	25	12	.12	.11
F	<i>Lappula occidentalis</i> (a)	15	10	6	4	.08	.07
F	<i>Lactuca serriola</i>	146	*10	61	6	.88	.08
F	<i>Madia glomerata</i> (a)	12	1	5	1	.02	.03
F	<i>Microsteris gracilis</i> (a)	-	*34	-	15	-	.22
F	<i>Phlox longifolia</i>	21	*4	8	2	.09	.01
F	<i>Polygonum douglasii</i> (a)	37	19	16	10	.08	.10
F	<i>Ranunculus testiculatus</i> (a)	28	36	11	16	.05	.17
F	<i>Sisymbrium altissimum</i> (a)	3	9	1	4	.15	.04
F	<i>Taraxacum officinale</i>	2	4	1	2	.00	.03
F	<i>Tragopogon dubius</i>	270	244	78	87	5.87	4.41
F	<i>Verbascum blattaria</i>	5	-	1	-	.00	-
F	<i>Vicia americana</i>	21	15	11	11	.08	.47
Total for Annual Forbs		511	938	189	294	2.62	26.26
Total for Perennial Forbs		685	601	248	240	10.62	10.00
Total for Forbs		1196	1539	437	534	13.25	36.27

\* Indicates significant difference at alpha = 0.10 (annuals excluded)

BROWSE TRENDS --

Herd unit 04 , Study no: 16

Type	Species	Strip Frequency		Average Cover %	
		'96	'01	'96	'01
B	Amelanchier alnifolia	1	1	-	.63
B	Artemisia arbuscula	12	18	3.07	3.79
B	Artemisia tridentata vaseyana	45	45	8.64	11.14
B	Chrysothamnus nauseosus albicaulis	0	1	-	.15
B	Chrysothamnus nauseosus consimilis	4	1	1.08	.15
B	Chrysothamnus viscidiflorus viscidiflorus	1	4	-	-
B	Gutierrezia sarothrae	15	23	.25	1.42
B	Mahonia repens	5	4	.45	.45
B	Purshia tridentata	1	0	.03	-
B	Rosa woodsii	4	4	.30	.18
B	Symphoricarpos oreophilus	3	4	1.82	1.66
Total for Browse		91	105	15.65	19.59

BASIC COVER --

Herd unit 04 , Study no: 16

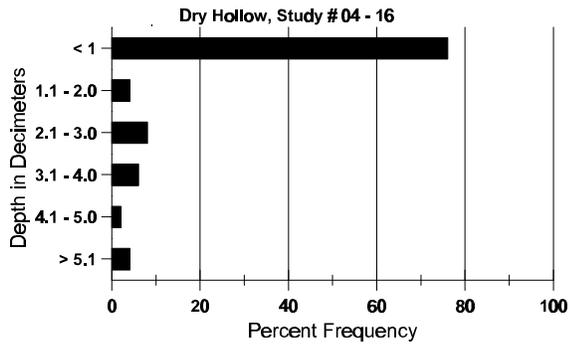
Cover Type	Nested Frequency		Average Cover %	
	'96	'01	'96	'01
Vegetation	486	478	54.15	61.36
Rock	222	200	5.23	5.51
Pavement	256	285	2.20	4.92
Litter	499	447	64.69	35.12
Cryptogams	20	3	.06	.03
Bare Ground	201	285	4.60	11.05

SOIL ANALYSIS DATA --

Herd Unit 04, Study no: 16, Dry Hollow

Effective rooting depth (in)	Temp °F (depth)	PH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
13.5	76.0 (16.1)	7.3	38.7	28.0	33.3	3.4	18.8	214.4	.8

# Stoniness Index



## PELLET GROUP FREQUENCY --

Herd unit 04 , Study no: 16

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'96	'01	'01	'01
Rabbit	2	1	-	-
Elk	1	-	-	-
Deer	9	6	44	3 (8)
Cattle	4	3	157	13 (32)

## BROWSE CHARACTERISTICS --

Herd unit 04 , Study no: 16

A G R E	Y	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total	
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier alnifolia																		
M	'96	-	1	-	-	-	-	-	-	-	1	-	-	-	20	23	28	1
	'01	-	-	1	-	-	-	-	-	-	1	-	-	-	20	21	31	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>				<u>% Change</u>						
'96		100%			00%			00%				+ 0%						
'01		00%			100%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'96	20	Dec:	-			
												'01	20		-			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Artemisia arbuscula</i>																		
Y	96	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	01	11	-	-	-	-	-	-	-	-	11	-	-	-	220		11	
M	96	23	10	-	-	-	-	-	-	-	33	-	-	-	660	11	27	
	01	25	10	-	-	-	-	-	-	-	35	-	-	-	700	10	20	
D	96	3	-	-	-	-	-	-	-	-	1	-	-	2	60		3	
	01	8	3	-	-	-	-	-	-	-	4	-	-	7	220		11	
X	96	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		26%			00%			05%			+33%							
'01		23%			00%			12%										
Total Plants/Acre (excluding Dead & Seedlings)												'96	760	Dec:	8%			
												'01	1140		19%			
<i>Artemisia tridentata vaseyana</i>																		
S	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
Y	96	8	-	-	-	-	-	-	-	-	8	-	-	-	160		8	
	01	17	-	-	-	-	-	-	-	-	16	-	1	-	340		17	
M	96	41	33	-	-	-	-	-	-	-	54	-	20	-	1480	24	40	
	01	63	8	1	-	-	-	-	-	-	72	-	-	-	1440	24	35	
D	96	-	5	-	-	-	-	-	-	-	4	-	1	-	100		5	
	01	7	1	-	-	-	-	-	-	-	4	-	-	4	160		8	
X	96	-	-	-	-	-	-	-	-	-	-	-	-	-	180		9	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	120		6	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		44%			00%			24%			+10%							
'01		09%			01%			05%										
Total Plants/Acre (excluding Dead & Seedlings)												'96	1740	Dec:	6%			
												'01	1940		8%			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Chrysothamnus nauseosus albicaulis</i>																		
D	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	1	-	-	-	-	-	-	-	-	-	-	-	1	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		00%			00%			00%										
'01		00%			00%			100%										
Total Plants/Acre (excluding Dead & Seedlings)												'96	0	Dec:	0%			
												'01	20		100%			
<i>Chrysothamnus nauseosus consimilis</i>																		
M	96	2	-	-	-	-	-	-	-	-	2	-	-	-	40	30	50	2
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0	31	59	0
D	96	1	-	-	1	-	-	-	-	-	1	-	-	1	40			2
	01	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1
X	96	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		00%			00%			25%			-75%							
'01		00%			00%			100%										
Total Plants/Acre (excluding Dead & Seedlings)												'96	80	Dec:	50%			
												'01	20		100%			
<i>Chrysothamnus viscidiflorus viscidiflorus</i>																		
M	96	1	-	-	-	-	-	-	-	-	-	-	1	-	20	16	26	1
	01	5	-	-	-	-	-	-	-	-	5	-	-	-	100	13	22	5
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		00%			00%			100%			+80%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'96	20	Dec:	-			
												'01	100		-			
<i>Gutierrezia sarothrae</i>																		
Y	96	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	01	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	96	28	-	-	1	-	-	-	-	-	29	-	-	-	580	10	11	29
	01	71	-	-	-	-	-	-	-	-	71	-	-	-	1420	8	10	71
D	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		00%			00%			00%			+56%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'96	640	Dec:	0%			
												'01	1460		1%			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<b>Mahonia repens</b>																		
Y	96	9	-	-	-	-	-	-	-	-	9	-	-	-	180		9	
	01	24	-	-	-	-	-	-	-	-	24	-	-	-	480		24	
M	96	72	-	-	-	-	-	-	-	72	-	-	-	1440	3	6	72	
	01	131	-	-	-	-	-	-	-	131	-	-	-	2620	3	3	131	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		00%			00%			00%			+48%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'96	1620	Dec:	-				
											'01	3100		-				
<b>Prunus virginiana</b>																		
M	96	-	-	-	-	-	-	-	-	-	-	-	-	0	13	20	0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		00%			00%			00%										
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'96	0	Dec:	-				
											'01	0		-				
<b>Purshia tridentata</b>																		
M	96	-	-	-	1	-	-	-	-	1	-	-	-	20	17	61	1	
	01	-	-	-	-	-	-	-	-	-	-	-	-	0	15	53	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		100%			00%			00%										
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'96	20	Dec:	-				
											'01	0		-				
<b>Rosa woodsii</b>																		
S	96	1	-	-	-	-	-	-	-	1	-	-	-	20			1	
	01	1	-	-	-	-	-	-	-	1	-	-	-	20			1	
Y	96	11	-	-	-	-	-	-	-	11	-	-	-	220			11	
	01	29	-	-	-	-	-	-	-	29	-	-	-	580			29	
M	96	15	-	-	-	-	-	-	-	15	-	-	-	300	15	24	15	
	01	8	-	-	2	-	-	-	-	10	-	-	-	200	15	21	10	
D	96	1	-	-	-	-	-	-	-	-	-	-	1	20			1	
	01	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		00%			00%			04%			+31%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'96	540	Dec:	4%				
											'01	780		0%				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
M	96	3	-	-	-	-	-	-	-	-	3	-	-	-	60	29	50	3
	01	3	-	-	1	-	-	-	-	-	4	-	-	-	80	30	48	4
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		00%			00%			00%			+25%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'96	60	Dec:	-			
												'01	80		-			