

Trend Study 1-4-06

Study site name: Chokecherry Springs .

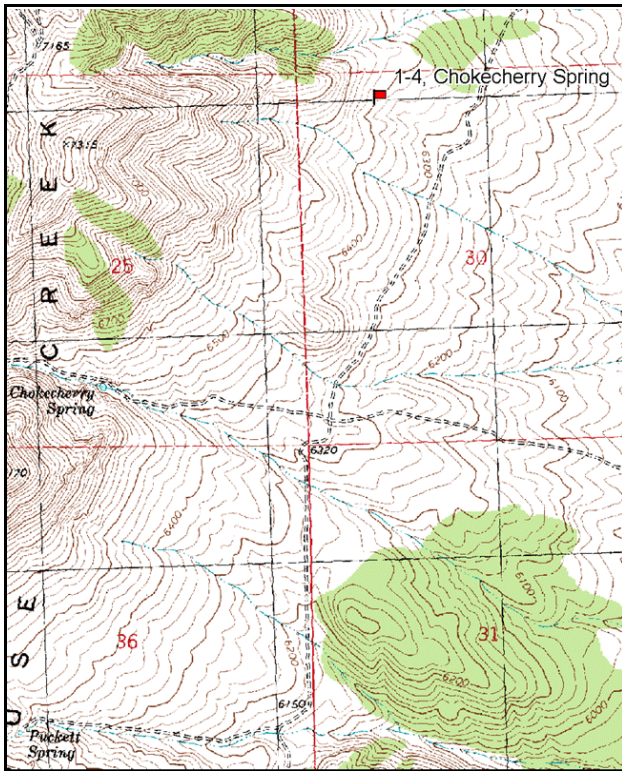
Vegetation type: Mountain Brush .

Compass bearing: frequency baseline 345 degrees magnetic.

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

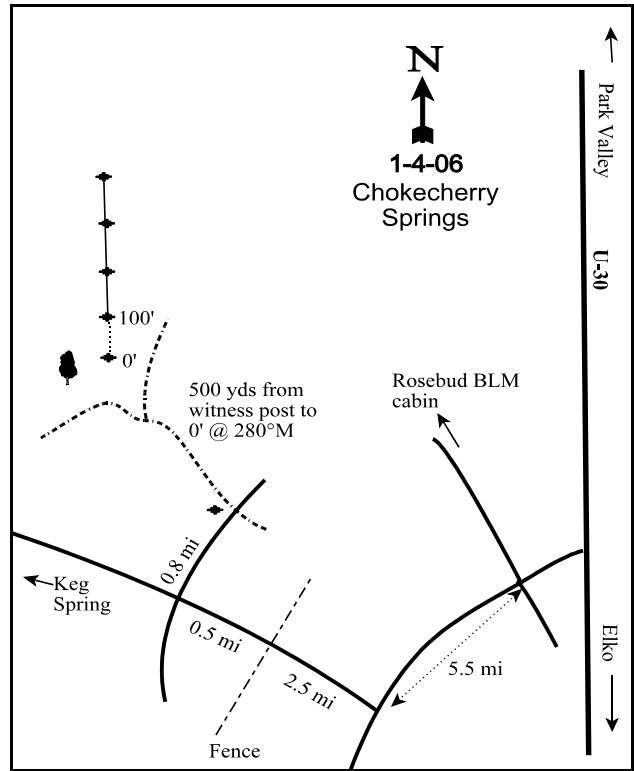
LOCATION DESCRIPTION

Proceed from U-30 towards the Rosebud BLM field station. Bear left at the fork to the BLM station. Travel 2.1 miles to canal and intersection with a sign designating Emigrant Pass Road. Proceed southwest on Emigrant Pass Road 5.5 miles to a fork. Turn right and travel 2.5 miles to a gate. Pass through the gate and proceed 0.5 miles and turn right at a four-way junction. Travel 0.8 miles to a witness post on left side of road and stop. From the witness post, take a bearing of 276 degrees magnetic to a large juniper, just off the left side of the drainage with several young around it. This juniper is located on the slope above the split in the drainage. Walk about 500 yards from the witness post to the large juniper. From this tree, take a bearing of 9 degrees magnetic and walk 9 paces to the 0-foot stake of the baseline, which is marked with browse tag #7910. The baseline runs at 345 degrees magnetic.



Map Name: Emigrant Pass

Township 10N , Range 16W , Section 30



Diagrammatic Sketch

UTM NAD 27 , UTM 12T 4604973 N , 272512 E

## DISCUSSION

### Chokecherry Spring - Trend Study No. 1-4

#### Study Information

This study is located on the east side of the Grouse Creek Mountains approximately one mile northeast of Chokecherry Spring (elevation: 6,400 feet, slope: 15%, aspect: east). This area is a mountain big sagebrush-grass type which contains a scattered population of antelope bitterbrush. The vegetation and topography are intermediate between the mountain brush type on steeper, higher slopes and the more gentle alluvial slopes to the east. Immediately below and east of the study area, there are broad ridges occupied by black sagebrush with intervening swales containing mostly basin big sagebrush. Elevation and exposure both suggest that the area is not critical deer winter range. The local conservation officer considers the area preferred winter range. A pellet group transect in 2001 estimated 36 deer days use/acre (88 deer days use/ha) and 3 cow days use/acre (7 cow days use/ha). In 2006, 21 deer and 9 cow days use/acre (53 ddu/ha and 22 cdu/ha) were estimated.

#### Soil

The Bullump series consist of deep, well drained soils that formed in colluvium derived from quartzite, welded tuff, chert, argillite, shale, conglomerate, and rhyolite with a component of loess (USDA-NRCS 2006). The soil texture is a clay loam, but quite rocky, and slightly alkaline (7.7 pH). Average effective rooting depth was estimated at nearly 16 inches. Rock and pavement combine to produce about 10% cover. The area has good litter cover and organic content. Phosphorus could be a limiting factor at only 5.9 ppm where values less than 6 ppm are considered low and may limit plant growth and development (Tiedemann and Lopez 2004). Vegetation cover from shrubs and herbaceous plants are adequate to prevent accelerated erosion. Low to moderate soil movement is occurring by trailing livestock and wildlife. The erosion condition class was determined to be only slight in 2001 and improved to stable in 2006.

#### Browse

Mountain big sagebrush is the key browse species and has the highest amount of browse cover. The density has been decreasing since 1984. Density decreased from 2,960 plants/acre in 1996 to 1,760 plants/acre in 2006. Sagebrush cover was 13% in 1996, 17% in 2001, and decreased to 10% in 2006. Utilization has been mostly light to moderate. Sagebrush decadence has been relatively moderate at around 25% until 2006 when it increased to 36%. Recruitment has decreased at each reading. Young plants only made up 2% of the population in 2006. Competition with cheatgrass may be limiting sagebrush recruitment. A serious threat to big sagebrush as well as most other browse species, is the winter feeding activities of voles (*Microtus* spp.). A large number of shrubs in the immediate area showed evidence of complete or near compete girdling damage during the 1984 reading. This appears to have commonly occurred during the severe winters of 1982-84. Such damage is especially evident in swales, however, it also occurred within the study area. Some winter injury was noted on some of the sagebrush in 1996, perhaps caused by the deep snows during the 1992-93 winter.

Antelope bitterbrush is another important preferred browses species. It has a semi-erect layering growth form. It made up 20% of the browse cover in 2001 and 2006. This species showed evidence of moderate to heavy deer use as well as rodent damage in 1984 and 1990. Bitterbrush density has varied between 600 and 800 plants/acre from 1996-2006, with cover of about 5%. Stickyleaf low rabbitbrush, an increaser, occurs in moderately high numbers.

#### Herbaceous Understory

Seven species of perennial grasses have been sampled on this study. In 1996 and 2001 they produced about 9% cover and increased to 13% cover in 2006. Most important is bluebunch wheatgrass followed by subalpine needlegrass, bottlebrush squirrel tail, and Sandberg bluegrass. Almost all of these showed evidence of use by cattle in 1984. Annual cheatgrass is the most widely distributed grass. It occurred in at least 89% of the quadrats since annuals were sampled in the early 1990's. Cheatgrass was most robust in 2001 with over

23% cover, even though this was a dry year. Cover was only 3% in 2006 and sum of nested frequency had significantly declined, although it was still present in 89% of the quadrats.

Forb composition is moderately diverse but not highly productive. The most productive forbs include: arrowleaf balsamroot, stoneseed, silvery lupine, tapertip hawksbeard, and longleaf phlox.

#### 1990 TREND ASSESSMENT

This relatively higher elevation winter range shows the potential for excellent mountain big sagebrush and bitterbrush production. The trend values for these key browse species are slightly down. Both populations have declined in density and show lower numbers of seedlings and young. Utilization of sagebrush is mostly light this year and percent decadence is stable. Bitterbrush has declined 60% in density and half of the plants sampled in 1990 are decadent. The grass trend is up as sum of nested frequency increased 37%. Sum of nested frequency for perennial forbs also increased by 25%.

browse - slightly down (-1)      grass - up (+2)      forb - up (+2)

#### 1996 TREND ASSESSMENT

Trend for browse is stable. Mountain big sagebrush density has declined slightly, decadence has increased from 22% to 26%, and the proportion of shrubs displaying poor vigor increased slightly (14% to 16%). Trend for antelope bitterbrush is up. Decadence declined from 50% to 0%, with heavy use decreasing from 50% to 3%. The differences in shrub density since 1990 is likely due to the larger, more representative sample used in 1996. The grass trend is up once again. Sum of nested frequency increased by 39%. Cheatgrass is abundant, but no prior data has collected on this species to determine a trend. The forb trend is stable. Sum of nested frequency of perennial forbs remained similar.

winter range condition (DC Index) - fair-good (63) Mid-level potential scale  
browse - stable (0)      grass - up (+2)      forb - stable (0)

#### 2001 TREND ASSESSMENT

Trend for the key browse species, mountain big sagebrush is slightly down. The density has declined slightly, percent decadence is still fairly high, and young recruitment is poor. There has been a decrease in the sagebrush population of about 15% during each sampling date since 1984. Trend for antelope bitterbrush is stable, but it accounts for only about 20% of the shrub cover with an estimated density of 800 plants/acre. Bitterbrush decadence remains low at 5%. The overall browse trend is slightly down. The grass trend is slightly up. Sum of nested frequency increased 43% for perennial grasses, despite the significant increase of cheatgrass. Cheatgrass is also very robust with over 23% cover. Frequency for perennial and annual forbs remained similar and the trend is stable. The DCI score declined to poor-fair with major increase of cheatgrass.

winter range condition (DC Index) - poor-fair (52) Mid-level potential scale  
browse - slightly down (-1)      grass - slightly up (+1)      forb - stable (0)

#### 2006 TREND ASSESSMENT

The soil trend is stable as ground cover characteristics changed very little. There was a decline of cheatgrass, which increased the amount of bare ground, but this was minimal. The browse trend is down. Mountain big sagebrush density decreased by 30% to 1,760 plants/acre. Decadence increased to 36% from only 21% in 2001. Sagebrush cover declined from 17% to 10%. Recruitment of young plants has decreased as only 2% of the population was classified as young in 2006. Competition with cheatgrass may have lead to this decline of recruitment. Drought conditions may have also contributed to the decline in sagebrush. Bitterbrush density has also declined from 800 plants/acre in 2001 to 600 plants/acre in 2006. Decadence increased from 5% to 20% in 2006. Stickyleaf low rabbitbrush density has declined since 1996. The grass trend is up as perennial

sum of nested frequency increased 25%. This has increased each time the site has been sampled and has increased by about two and a half times since 1984. Cheatgrass decreased significantly and only had about 3% cover, but was still present in 89% of the quadrats. The forb trend is also up as perennials increased and annuals decreased. The DCI score improved to fair-good with major improvements in the herbaceous understory.

winter range condition (DC Index) - fair-good (65) Mid-level potential scale  
browse - down (-2)                      grass - up (+2)                      forb - up (+2)

HERBACEOUS TRENDS --  
 Management unit 01 , Study no: 4

T y p e	Species	Nested Frequency					Average Cover %		
		'84	'90	'96	'01	'06	'96	'01	'06
G	Agropyron dasystachyum	a-	a-	ab12	b17	b30	.59	.51	.83
G	Agropyron spicatum	58	72	50	52	58	2.91	2.30	3.46
G	Bromus tectorum (a)	-	-	b318	c360	a271	6.21	23.46	3.01
G	Festuca ovina	-	1	5	-	-	.19	-	-
G	Oryzopsis hymenoides	4	14	11	10	17	.37	.07	1.00
G	Poa secunda	a22	a35	a58	b140	b170	.99	3.95	5.61
G	Sitanion hystrix	ab17	a10	abc30	bc41	c50	1.18	.81	1.42
G	Stipa thurberiana	a-	a6	b26	ab15	ab19	2.45	.84	.68
Total for Annual Grasses		0	0	318	360	271	6.21	23.46	3.01
Total for Perennial Grasses		101	138	192	275	344	8.69	8.51	13.02
Total for Grasses		101	138	510	635	615	14.90	31.97	16.04
F	Agoseris glauca	a28	a32	a5	a2	b66	.01	.01	.42
F	Allium sp.	b40	a4	ab14	a92	a71	.04	.67	.30
F	Androsace septentrionalis (a)	-	-	-	-	3	-	-	.15
F	Astragalus beckwithii	a4	ab15	c37	bc28	a7	.53	.80	.25
F	Astragalus cibaricus	b34	b24	a-	a-	b38	-	-	1.76
F	Balsamorhiza sagittata	4	6	11	6	14	1.29	.68	2.49
F	Castilleja linariaefolia	-	-	-	-	3	-	-	.00
F	Camelina microcarpa (a)	-	-	b76	b74	a23	.19	.81	.07
F	Calochortus nuttallii	-	2	-	5	2	-	.01	.00
F	Chaenactis douglasii	4	2	7	-	-	.01	-	-
F	Cirsium arvense	5	4	4	-	-	.01	-	-
F	Collomia linearis (a)	-	-	b46	a8	a-	.15	.01	-
F	Comandra pallida	a7	a6	ab29	b36	b34	.55	.50	.24
F	Collinsia parviflora (a)	-	-	179	156	159	.93	1.30	.72
F	Crepis acuminata	a2	b33	b17	ab11	ab18	.35	.31	.62
F	Cryptantha sp.	a-	a-	b13	a-	b15	.04	-	.05

Type	Species	Nested Frequency					Average Cover %		
		'84	'90	'96	'01	'06	'96	'01	'06
F	<i>Descurainia pinnata</i> (a)	-	-	-	-	4	-	-	.01
F	<i>Draba</i> sp. (a)	-	-	-	2	-	-	.00	-
F	<i>Epilobium brachycarpum</i> (a)	-	-	-	-	11	-	-	.04
F	<i>Galium aparine</i> (a)	-	-	8	-	-	.04	-	-
F	<i>Gayophytum ramosissimum</i> (a)	-	-	<sub>a</sub> 1	<sub>b</sub> 51	<sub>a</sub> 2	.03	.67	.00
F	<i>Gilia</i> sp. (a)	-	-	-	11	-	-	.01	-
F	<i>Hackelia patens</i>	<sub>ab</sub> 19	<sub>b</sub> 27	<sub>a</sub> 8	<sub>a</sub> 1	<sub>a</sub> 9	.04	.00	.11
F	<i>Lappula occidentalis</i> (a)	-	-	-	2	5	-	.01	.01
F	<i>Lactuca serriola</i>	2	-	-	-	3	-	-	.01
F	<i>Lithospermum ruderale</i>	1	15	15	7	15	1.20	.29	1.00
F	<i>Lomatium triternatum</i>	9	13	8	4	8	.04	.01	.04
F	<i>Lupinus argenteus</i>	<sub>ab</sub> 13	<sub>a</sub> 3	<sub>b</sub> 23	<sub>ab</sub> 17	<sub>b</sub> 21	1.33	1.46	1.84
F	<i>Lygodesmia spinosa</i>	<sub>ab</sub> 29	<sub>b</sub> 47	<sub>ab</sub> 37	<sub>a</sub> 19	<sub>a</sub> 24	.66	.55	.75
F	<i>Machaeranthera</i> spp	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 13	<sub>a</sub> -	<sub>a</sub> -	.02	-	-
F	<i>Microsteris gracilis</i> (a)	-	-	<sub>a</sub> -	<sub>c</sub> 32	<sub>b</sub> 11	-	.47	.02
F	<i>Oenothera caespitosa</i>	2	2	2	-	-	.03	-	-
F	<i>Penstemon speciosus</i>	-	1	-	-	-	-	-	-
F	<i>Phlox longifolia</i>	<sub>a</sub> 60	<sub>ab</sub> 89	<sub>b</sub> 100	<sub>b</sub> 103	<sub>b</sub> 97	.51	.80	.69
F	<i>Ranunculus testiculatus</i> (a)	-	-	7	13	-	.01	.02	-
F	<i>Tragopogon dubius</i>	1	5	5	2	6	.04	.01	.07
F	<i>Veronica biloba</i> (a)	-	-	<sub>a</sub> 21	<sub>a</sub> 20	<sub>b</sub> 44	.06	.05	.44
F	<i>Viola</i> sp.	-	-	-	-	3	-	-	.00
Total for Annual Forbs		0	0	338	369	262	1.43	3.39	1.49
Total for Perennial Forbs		264	330	348	333	454	6.75	6.12	10.67
Total for Forbs		264	330	686	702	716	8.19	9.51	12.16

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

BROWSE TRENDS --

Management unit 01 , Study no: 4

Type	Species	Strip Frequency			Average Cover %		
		'96	'01	'06	'96	'01	'06
B	<i>Artemisia tridentata vaseyana</i>	70	65	47	13.18	16.61	10.38
B	<i>Chrysothamnus nauseosus consimilis</i>	7	7	3	.79	.96	.81
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	77	72	65	10.39	5.98	5.88
B	<i>Juniperus osteosperma</i>	3	6	8	.01	.33	1.06
B	<i>Opuntia sp.</i>	12	8	8	.03	.56	.30
B	<i>Purshia tridentata</i>	28	25	24	3.91	6.42	5.16
B	<i>Symphoricarpos oreophilus</i>	5	10	10	.07	1.43	1.70
Total for Browse		202	193	165	28.41	32.32	25.29

CANOPY COVER, LINE INTERCEPT --

Management unit 01 , Study no: 4

Species	Percent Cover	
	'01	'06
<i>Artemisia tridentata vaseyana</i>	-	13.11
<i>Chrysothamnus nauseosus consimilis</i>	-	.03
<i>Chrysothamnus viscidiflorus viscidiflorus</i>	-	7.84
<i>Juniperus osteosperma</i>	1.00	2.73
<i>Opuntia sp.</i>	-	.08
<i>Purshia tridentata</i>	-	10.89
<i>Symphoricarpos oreophilus</i>	-	2.96

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 01 , Study no: 4

Species	Average leader growth (in)	
	'01	'06
<i>Artemisia tridentata vaseyana</i>	2.7	2.1
<i>Purshia tridentata</i>	1.6	1.1

POINT-QUARTER TREE DATA --  
Management unit 01 , Study no: 4

Species	Trees per Acre	
	'01	'06
Juniperus osteosperma	76	86

Average diameter (in)	
'01	'06
2.6	4.1

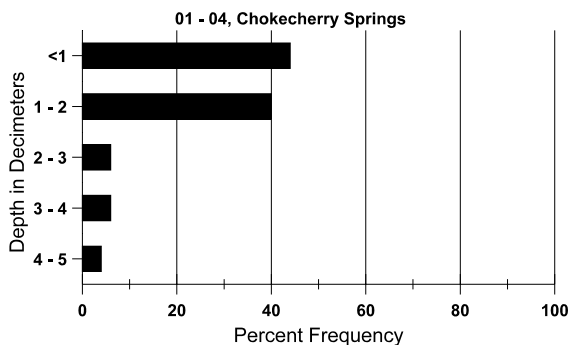
BASIC COVER --  
Management unit 01 , Study no: 4

Cover Type	Average Cover %				
	'84	'90	'96	'01	'06
Vegetation	1.75	11.50	46.40	62.06	50.70
Rock	8.25	9.75	6.39	4.69	2.79
Pavement	14.75	16.50	6.14	4.69	6.46
Litter	58.50	45.25	55.46	44.56	45.93
Cryptogams	0	0	.05	.06	.21
Bare Ground	16.75	17.00	7.03	7.97	12.13

SOIL ANALYSIS DATA --  
Herd Unit 01, Study no: 04, Chokecherry Springs

Effective rooting depth (in)	Temp °F (depth)	PH	Clay loam			%OM	PPM P	PPM K	dS/m
			% sand	% silt	% clay				
15.8	60.6 (16.9)	7.7	41.7	29.0	29.3	2.5	5.9	201.6	0.5

**Stoniness Index**



PELLET GROUP DATA --  
Management unit 01 , Study no: 4

Type	Quadrat Frequency		
	'96	'01	'06
Rabbit	5	1	18
Deer	11	14	7
Cattle	3	1	3

Days use per acre (ha)	
'01	'06
-	-
36 (88)	21 (53)
3 (7)	9 (22)

BROWSE CHARACTERISTICS --  
Management unit 01 , Study no: 4

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Artemisia tridentata vaseyana</i>												
84	<b>3999</b>	333	1800	1333	866	-	30	18	22	-	5	34/36
90	<b>3399</b>	-	266	2400	733	-	8	2	22	3	14	19/25
96	<b>2960</b>	180	340	1840	780	980	9	1	26	14	16	20/32
01	<b>2520</b>	-	100	1880	540	840	2	0	21	4	4	22/33
06	<b>1760</b>	280	40	1080	640	960	22	2	36	9	10	24/36
<i>Chrysothamnus nauseosus consimilis</i>												
84	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
90	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
96	<b>200</b>	-	100	60	40	-	0	0	20	-	0	26/36
01	<b>160</b>	80	40	100	20	-	25	0	13	-	0	26/26
06	<b>80</b>	-	-	80	-	-	0	0	0	-	0	25/33
<i>Chrysothamnus viscidiflorus viscidiflorus</i>												
84	<b>3932</b>	-	666	2466	800	-	20	0	20	-	0	28/32
90	<b>3333</b>	-	533	1600	1200	-	6	0	36	1	6	15/16
96	<b>3660</b>	-	200	3340	120	-	7	.54	3	1	2	14/24
01	<b>3000</b>	-	100	2520	380	80	3	0	13	3	3	11/18
06	<b>2460</b>	100	160	2000	300	40	0	0	12	2	2	13/22
<i>Juniperus osteosperma</i>												
84	<b>66</b>	-	66	-	-	-	0	0	-	-	0	-/-
90	<b>66</b>	66	66	-	-	-	0	0	-	-	0	-/-
96	<b>60</b>	40	40	20	-	-	0	0	-	-	0	-/-
01	<b>120</b>	20	120	-	-	-	0	0	-	-	0	-/-
06	<b>160</b>	20	160	-	-	-	0	0	-	-	0	-/-
<i>Opuntia sp.</i>												
84	<b>200</b>	-	-	200	-	-	0	0	0	-	0	6/5
90	<b>200</b>	-	-	200	-	-	0	0	0	-	0	8/17
96	<b>300</b>	-	20	260	20	-	0	0	7	-	0	5/15
01	<b>180</b>	-	-	180	-	-	0	0	0	-	0	5/10
06	<b>160</b>	-	-	160	-	-	0	13	0	-	0	5/12

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<b>Purshia tridentata</b>												
84	<b>333</b>	-	333	-	-	-	20	40	0	-	20	-/-
90	<b>132</b>	-	-	66	66	-	50	50	50	-	0	15/35
96	<b>740</b>	-	80	660	-	20	35	3	0	-	0	27/54
01	<b>800</b>	-	20	740	40	20	45	8	5	-	0	33/57
06	<b>600</b>	460	40	440	120	-	43	13	20	3	3	32/58
<b>Symphoricarpos oreophilus</b>												
84	<b>266</b>	-	133	133	-	-	25	0	0	-	0	26/65
90	<b>332</b>	-	66	200	66	-	0	0	20	-	20	17/52
96	<b>120</b>	-	40	80	-	-	33	17	0	-	0	21/47
01	<b>260</b>	-	-	260	-	-	0	0	0	-	0	21/49
06	<b>360</b>	-	40	300	20	-	0	0	6	-	0	19/45