

ABOVE WOODLAND - TREND STUDY NO. 7-9-11

Vegetation Type: Mountain Brush

Range Type: Crucial Deer Winter, Crucial Elk Winter

NRCS Ecological Site Description: [Mountain Loam \(Mountain Big Sagebrush\), R047XA463UT](#)

Land Ownership: Private

Elevation: 6,960 ft (2,121 m)

Aspect: Southwest

Slope: 25-35%

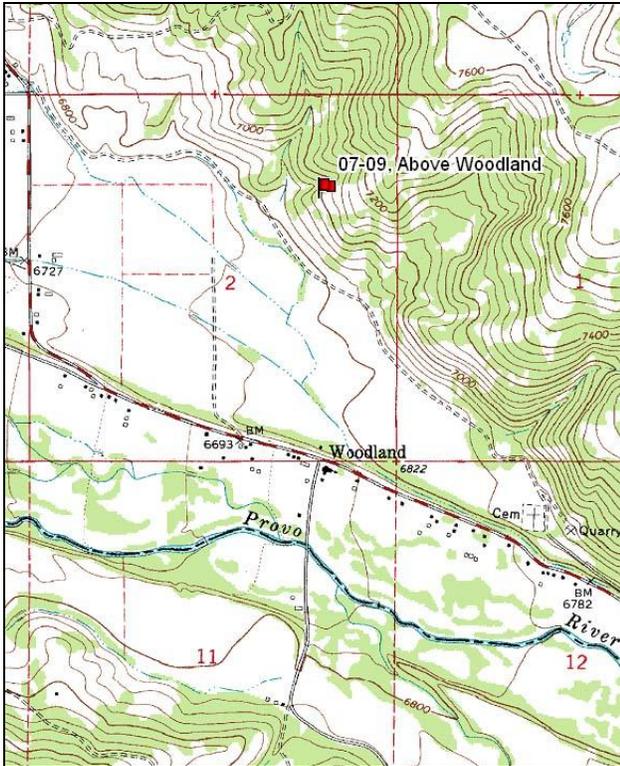
Transect bearing: 76° magnetic

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

Directions:

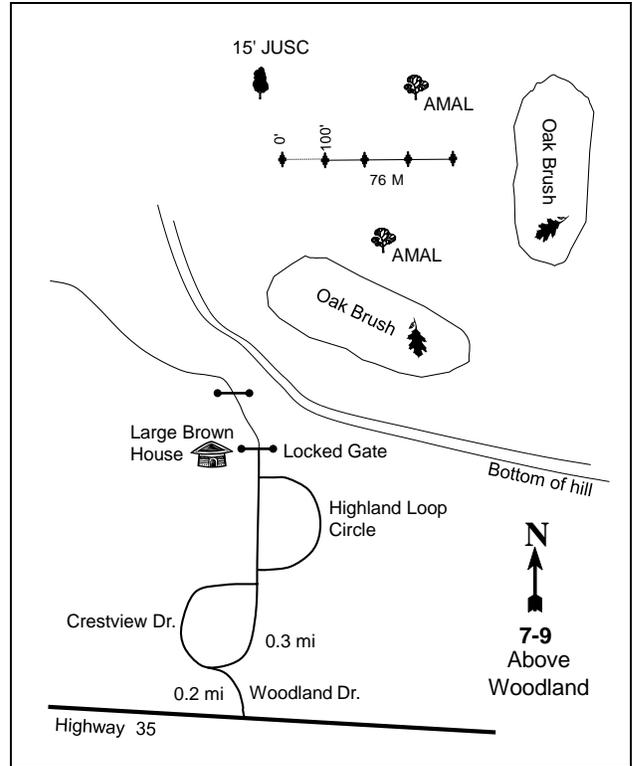
From the intersection of Highway 35 and Woodland Drive, west of Woodland, turn onto Woodland Drive and proceed 0.2 miles. Turn onto Crestview Drive and proceed 0.3 miles to Highland Loop Circle. Turn left and follow the circle 0.1 miles to a dirt road. Travel along the road past a large brown house to a fork after 0.15 miles to a gate. From here, cross the fence and walk up the slope. Walk around the west end of a large oak clone and continue up the slope. Look for a large, lone high lined Rocky Mountain Juniper. The 0-foot baseline is ten feet from this tree. The baseline runs between two large serviceberry.

Map Name: Woodland



Township: 3S Range: 6E Section: 2

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 480781 E 4493448 N

## ABOVE WOODLAND - TREND STUDY NO. 7-9

### Site Information

Site Description: The study is located on private land north of Woodland. A study was originally established in 1984 that sampled an intermixed mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), grass, and Gambel oak (*Quercus gambelii*) winter range farther to the north. Due to low big game use and low numbers of mountain big sagebrush sampled, the site was moved about a quarter of a mile to the south in 2001. The new study area supports a denser stand of sagebrush in association with other preferred browse species including Saskatoon serviceberry (*Amelanchier alnifolia*) and antelope bitterbrush (*Purshia tridentata*). This area is at a high enough elevation that deep snow may preclude use during severe winters. Elk pellet groups were sampled in moderate abundance in 2001, heavy abundance in 2006, and low abundance in 2011. Deer pellet groups have been sampled in low abundance since 2001. A few moose pellets were sampled in quadrat frequency in 2006 (Table - Pellet Group Data).

Browse: The browse composition consists primarily of mountain big sagebrush, with lesser amounts of serviceberry and antelope bitterbrush. Mountain big sagebrush provided over half of the total browse cover in 2001, but has decreased steadily since that time (Table - Browse Trends). The sagebrush population is moderately dense and displays mostly light to moderate use. Similar to cover, density of sagebrush has decreased since 2001. Decadence and poor vigor are both high in the sagebrush population, and recruitment of young sagebrush has been poor. In contrast to sagebrush, serviceberry has steadily increased in density, though the small population has displayed heavy use over the sample years. Only a few bitterbrush plants occur on the site, but have displayed moderate to heavy use. Despite the heavy use, both serviceberry and bitterbrush have low decadence and good vigor. Other browse sampled include low numbers of dwarf rabbitbrush (*Chrysothamnus depressus*), stickyleaf low rabbitbrush (*C. viscidiflorus* ssp. *viscidiflorus*), broom snakeweed (*Gutierrezia sarothrae*), snowberry (*Symphoricarpos oreophilus*), gray horsebrush (*Tetradymia canescens*), and high numbers of Oregon grape (*Mahonia repens*) (Table - Browse Characteristics).

Herbaceous Understory: The herbaceous understory is moderately abundant, but may be limited somewhat by competition with shrubs and poor site potential caused by the high rock content of the soil. Perennial grasses are diverse and abundant on the site. Bluebunch wheatgrass (*Agropyron spicatum*) provides the majority of the grass cover on the site, but the bluegrass species Kentucky bluegrass (*Poa pratensis*), Sandberg bluegrass (*P. secunda*), and bulbous bluegrass (*P. bulbosa*) are also common. Bulbous bluegrass is an introduced weedy species that increased significantly on the site in 2011. The annual grasses Japanese chess (*Bromus japonicus*) and cheatgrass (*B. tectorum*) are also common on the site. Forbs are also diverse and moderately abundant, but consist of a mixture of perennial and annual species. The only moderately abundant perennial forb species consist of Louisiana sage (*Artemisia ludoviciana*) and silvery lupine (*Lupinus argenteus*). Most other perennial forb species occur infrequently (Table - Herbaceous Trends).

Soil: Soils on the site are part of the Horrocks-Agassiz very cobbly loams, likely as part of the Horrocks component. These soils are found on mountain slopes and parent material consists of colluvium derived from sandstone, conglomerate, and andesite (Soil Survey Staff 2011). The soil texture is a clay loam with a slightly acid soil reaction (pH 6.2) (Table - Soil Analysis Data). The site is very rocky and surface rocks vary in size from pavement to large rock. Percent surface rock and pavement cover is high. There is also abundant protective ground cover provided by vegetation and litter, which leaves little exposed bare ground (Table - Basic Cover). The soil erosion condition has been classified as stable since 2001.

## Trend Assessments

### Browse:

- **2001 to 2006 - down (-2):** Mountain big sagebrush is the most abundant browse species, but has decreased in density by 44% from 2,260 plants/acre to 1,260 plants/acre, and cover decreased from 16% to 12%. Decadence of sagebrush increased from 21% to 38%, and poor vigor increased from 8% to 29%. Serviceberry density increased 12% from 840 plants/acre to 940 plants/acre, and bitterbrush increased from 20 plants/acre to 80 plants/acre.
- **2006 to 2011 - slightly down (-1):** The density of mountain big sagebrush decreased by 10% to 1,140 plants/acre, and cover decreased to 7%. However, serviceberry density increased by 15% to 1,080 plants/acre, and cover increased from 6% to 7%. Sagebrush and serviceberry are now co-dominant browse species on the site.

### Grass:

- **2001 to 2006 - slightly down (-1):** There was little change in the sum of nested frequency of perennial grasses, but annual grasses increased substantially on the site. Cheatgrass increased significantly in nested frequency, and cover increased from less than 1% to 4%. There was also an increase in the nested frequency and cover of Japanese chess, though not significant.
- **2006 to 2011 - stable (0):** The sum of nested frequency of perennial grasses changed little, though cover increased from 13% to 20%. The weedy species bulbous bluegrass increased significantly in nested frequency, and cover increased from near 0% to 2%.

### Forb:

- **2001 to 2006 - stable (0):** The perennial forb sum of nested frequency remained similar, though annual forb sum of nested frequency increased almost two-fold. Cover of perennial forbs remained similar at 3%, but annual forb cover increased from 1% to 2%.
- **2006 to 2011 - up (+2):** The sum of nested frequency of perennial forbs increased more than two-fold, and cover increased to 7%. Annual forb sum of nested frequency also increased substantially, and cover increased to 12%.

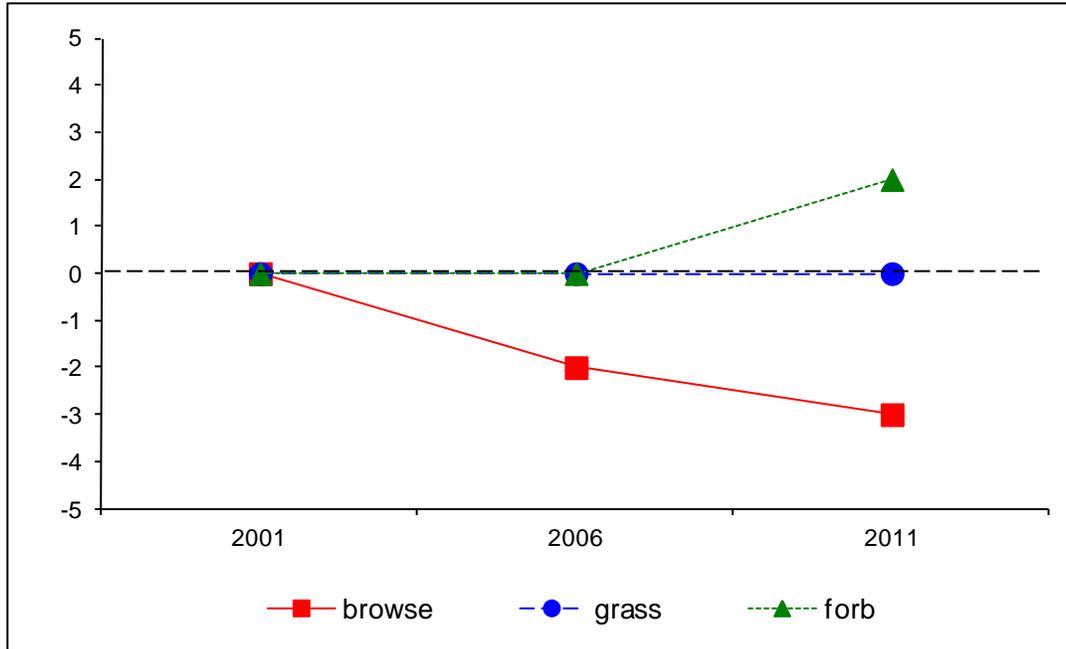
## DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --

Management unit 7, study no: 9

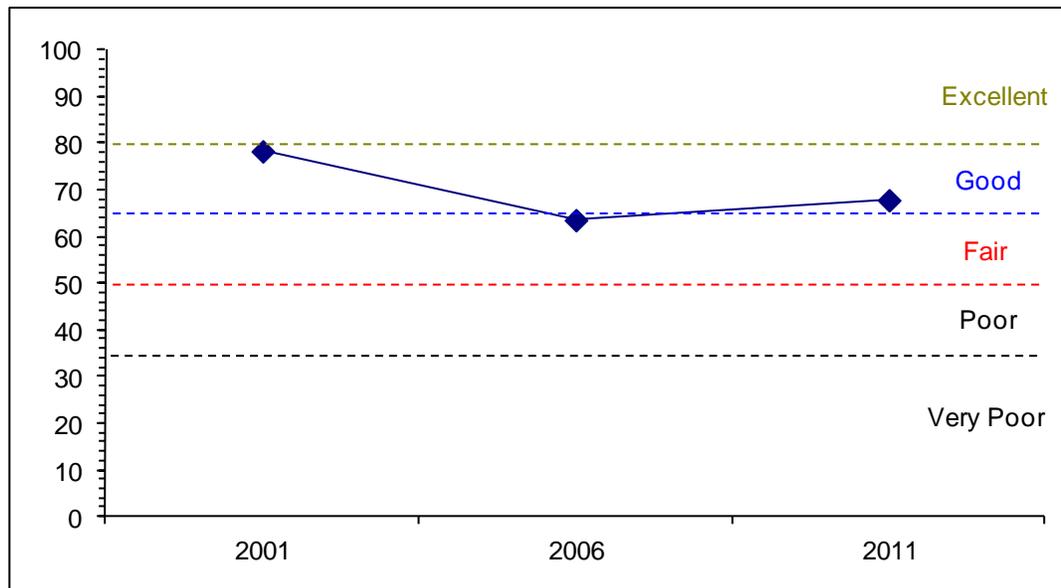
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover (-POBU)	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
01	30.0	10.0	3.5	29.6	-1.2	6.4	0.0	<b>78.3</b>	Good-Excellent
06	25.9	6.9	3.2	25.1	-4.3	6.7	0.0	<b>63.5</b>	Fair-Good
11	20.3	8.5	2.6	30.0	-3.5	10.0	0.0	<b>67.8</b>	Good

## Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--  
Management unit 7 Study no: 9



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL--  
Management unit 7, Study no: 9



HERBACEOUS TRENDS--  
Management unit 07, Study no: 9

T y p e	Species	Nested Frequency			Average Cover %		
		'01	'06	'11	'01	'06	'11
G	Agropyron spicatum	198	205	211	9.50	8.21	13.27
G	Agropyron trachycaulum	17	4	-	.54	.03	-
G	Bromus carinatus	a1	b29	ab17	.03	.83	.13
G	Bromus japonicus (a)	a135	b179	ab175	1.26	1.75	1.53
G	Bromus tectorum (a)	a48	b233	b208	.39	3.94	3.12
G	Koeleria cristata	8	6	8	.56	.36	.21
G	Melica bulbosa	-	3	8	-	.00	.18
G	Oryzopsis hymenoides	-	3	-	-	.03	-
G	Poa bulbosa	a-	a5	b32	-	.06	1.82
G	Poa fendleriana	a28	ab23	a7	.23	.48	.06
G	Poa pratensis	b87	a47	ab72	1.56	.68	1.59
G	Poa secunda	ab135	b159	a114	1.94	1.86	2.42
G	Sitanion hystrix	b23	a1	a-	.43	.03	-
Total for Annual Grasses		183	412	383	1.65	5.69	4.65
Total for Perennial Grasses		497	485	469	14.80	12.61	19.72
Total for Grasses		680	897	852	16.46	18.30	24.38
F	Achillea millefolium	-	-	2	-	-	.00
F	Agoseris glauca	a7	a1	b24	.01	.00	.14
F	Allium sp.	a36	a20	b98	.11	.11	.32
F	Alyssum alyssoides (a)	a55	b132	c250	.19	.36	2.49
F	Arabis sp.	4	3	1	.06	.00	.03
F	Artemisia ludoviciana	40	33	39	1.64	.80	1.62
F	Astragalus sp.	-	-	-	-	-	.00
F	Calochortus nuttallii	6	3	5	.01	.00	.02
F	Cirsium undulatum	a8	a11	b41	.10	.18	1.54
F	Collinsia parviflora (a)	a24	b46	b78	.04	.13	.25
F	Collomia linearis (a)	a44	a29	b103	.12	.27	.64
F	Cymopterus sp.	a3	b17	b18	.00	.14	.30
F	Descurainia pinnata (a)	8	2	22	.01	.01	.13
F	Draba sp. (a)	a-	b49	c161	-	.44	2.84
F	Epilobium brachycarpum (a)	a3	b72	c220	.01	.27	3.64
F	Erigeron pumilus	-	-	4	-	-	.06
F	Eriogonum racemosum	a4	a15	b31	.06	.48	.47
F	Eriogonum umbellatum	4	2	6	.01	.15	.18
F	Erodium cicutarium (a)	a-	b12	c50	-	.03	.48
F	Galium aparine (a)	a3	a2	b48	.03	.00	1.49
F	Gayophytum ramosissimum(a)	a-	a-	b29	-	-	.16
F	Holosteum umbellatum (a)	7	5	9	.01	.01	.01
F	Lithophragma sp.	a-	a-	b11	-	-	.10
F	Lupinus argenteus	10	16	7	.97	1.30	.96
F	Microsteris gracilis (a)	a2	c50	b32	.00	.19	.07
F	Phlox longifolia	14	9	2	.03	.07	.01
F	Polygonum douglasii (a)	b50	a14	a4	.18	.05	.01

Type	Species	Nested Frequency			Average Cover %		
		'01	'06	'11	'01	'06	'11
F	Ranunculus testiculatus (a)	-	4	1	-	.01	.03
F	Senecio integerrimus	2	1	5	.03	.03	.03
F	Senecio multilobatus	1	-	-	.03	-	-
F	Taraxacum officinale	-	-	5	-	-	.06
F	Tragopogon dubius (a)	<sub>b</sub> 25	<sub>a</sub> 2	<sub>a</sub> 1	.23	.03	.03
F	Viguiera multiflora	<sub>ab</sub> 3	<sub>a</sub> 1	<sub>b</sub> 26	.09	.03	.93
F	Viola sp.	-	-	2	-	-	.00
F	Zigadenus paniculatus	-	-	5	-	.03	.03
Total for Annual Forbs		221	419	1008	0.84	1.83	12.32
Total for Perennial Forbs		142	132	332	3.19	3.35	6.87
Total for Forbs		363	551	1340	4.04	5.19	19.19

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

#### BROWSE TRENDS--

Management unit 07, Study no: 9

Type	Species	Strip Frequency			Average Cover %		
		'01	'06	'11	'01	'06	'11
B	Amelanchier alnifolia	34	38	45	6.10	6.43	7.19
B	Artemisia tridentata vaseyana	62	44	45	15.92	12.15	6.66
B	Chrysothamnus depressus	10	11	8	.45	.45	.31
B	Chrysothamnus viscidiflorus viscidiflorus	5	1	8	.15	.00	1.41
B	Gutierrezia sarothrae	20	14	16	.98	.48	.93
B	Mahonia repens	37	39	33	1.29	1.16	2.49
B	Opuntia sp.	9	6	1	.03	.00	.03
B	Purshia tridentata	1	3	3	1.78	.71	.76
B	Symphoricarpos oreophilus	24	24	19	1.37	2.37	2.03
B	Tetradymia canescens	1	0	0	-	-	-
Total for Browse		203	180	178	28.10	23.79	21.83

#### CANOPY COVER, LINE INTERCEPT--

Management unit 07, Study no: 9

Species	Percent Cover	
	'06	'11
Amelanchier alnifolia	7.96	8.06
Artemisia tridentata vaseyana	9.21	6.59
Chrysothamnus depressus	.85	.51
Chrysothamnus viscidiflorus viscidiflorus	.20	-
Gutierrezia sarothrae	.46	.51
Mahonia repens	.80	1.04
Purshia tridentata	1.89	.38
Symphoricarpos oreophilus	3.86	1.81

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 07, Study no: 9

Species	Average leader growth (in)		
	'01	'06	'11
Amelanchier alnifolia	2.6	4.4	2.6
Artemisia tridentata vaseyana	1.5	2.2	3.0
Purshia tridentata	3.4	4.1	1.2

BASIC COVER--

Management unit 07, Study no: 9

Cover Type	Average Cover %		
	'01	'06	'11
Vegetation	48.56	41.57	52.95
Rock	23.71	22.26	18.85
Pavement	15.28	7.81	8.62
Litter	36.37	32.12	34.15
Cryptogams	.39	.57	.44
Bare Ground	5.36	13.60	5.73

SOIL ANALYSIS DATA --

Management unit 07, Study no: 9, Study Name: Above Woodland

Effective rooting depth (in)	pH	Clay-Loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
6.6	6.2	36.2	35.4	28.4	3.8	27.6	214.4	0.5

PELLET GROUP DATA--

Management unit 07, Study no: 9

Type	Quadrat Frequency			Days use per acre (ha)		
	'01	'06	'11	'01	'06	'11
Rabbit	12	2	3	-	-	-
Moose	-	3	-	-	-	-
Elk	15	31	30	31 (78)	64 (157)	13 (31)
Deer	7	6	4	16 (40)	11 (28)	14 (33)

BROWSE CHARACTERISTICS--

Management unit 07, Study no: 9

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
Amelanchier alnifolia									
01	<b>840</b>	17	74	10	20	48	26	7	30/38
06	<b>940</b>	19	72	9	20	6	72	2	33/42
11	<b>1080</b>	4	94	2	-	35	52	2	28/35
Artemisia tridentata vaseyana									
01	<b>2260</b>	4	75	21	-	6	0	8	22/34
06	<b>1260</b>	0	62	38	20	21	3	29	22/37
11	<b>1140</b>	7	53	40	20	39	2	33	22/38

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>Chrysothamnus depressus</b>									
01	<b>260</b>	0	100	-	-	0	0	0	7/14
06	<b>300</b>	0	100	-	20	0	7	0	7/14
11	<b>220</b>	0	100	-	-	0	0	0	6/13
<b>Chrysothamnus viscidiflorus viscidiflorus</b>									
01	<b>140</b>	0	100	-	-	0	0	0	13/15
06	<b>20</b>	0	100	-	-	0	0	0	16/21
11	<b>180</b>	44	56	-	-	0	0	0	8/13
<b>Gutierrezia sarothrae</b>									
01	<b>700</b>	9	89	3	-	0	0	3	8/14
06	<b>520</b>	4	96	0	-	0	0	0	7/11
11	<b>600</b>	0	100	0	-	0	0	0	6/13
<b>Mahonia repens</b>									
01	<b>10760</b>	1	99	0	-	0	0	0	4/5
06	<b>8420</b>	2	98	0	-	0	0	0	3/4
11	<b>4660</b>	20	80	0	-	0	0	0	4/5
<b>Opuntia sp.</b>									
01	<b>340</b>	6	94	-	-	0	0	0	3/8
06	<b>120</b>	17	83	-	-	0	0	0	3/8
11	<b>20</b>	0	100	-	-	0	0	0	4/10
<b>Purshia tridentata</b>									
01	<b>20</b>	0	100	0	-	100	0	0	26/122
06	<b>80</b>	0	100	0	-	0	100	0	21/68
11	<b>80</b>	0	50	50	-	50	50	50	12/37
<b>Symphoricarpos oreophilus</b>									
01	<b>500</b>	4	80	16	-	0	0	4	18/29
06	<b>700</b>	6	89	6	-	6	3	6	16/23
11	<b>440</b>	9	86	5	40	27	5	14	19/28
<b>Tetradymia canescens</b>									
01	<b>20</b>	0	100	-	-	0	0	0	-/-
06	<b>0</b>	0	0	-	-	0	0	0	-/-
11	<b>0</b>	0	0	-	-	0	0	0	-/-