

WARREN DRAW - TREND STUDY NO. 9-7-10

Vegetation Type: Mountain Big Sagebrush

Range Type: Crucial Deer Summer (Fawning habitat), Crucial Elk Summer (Calving habitat)

NRCS Ecological Site Description: [Mountain Loam \(Mountain Big Sagebrush\), R047XC430UT](#)

Land Ownership: BLM

Elevation: 7400 ft. (2256 m)

Aspect: West

Slope: 4%-20%

Transect bearing: 2° magnetic

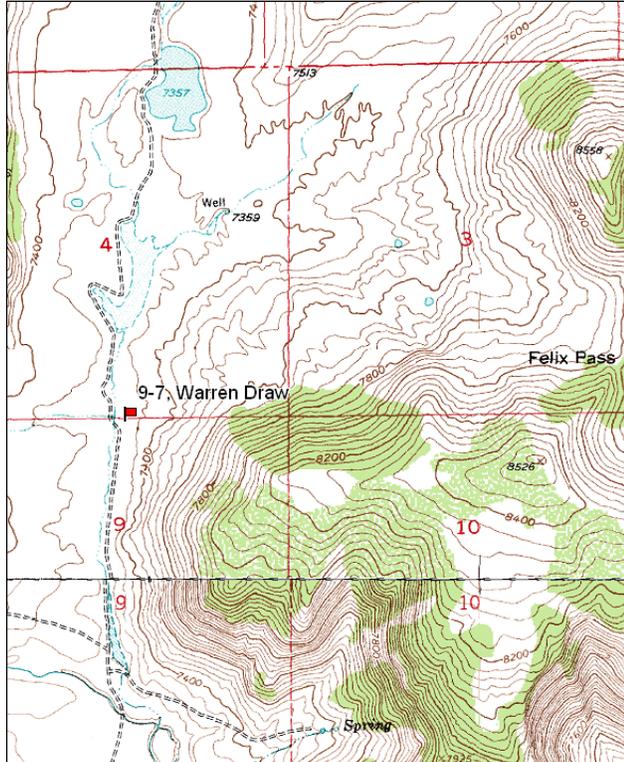
Belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

Directions:

From the junction between Crouse and Calder reservoirs proceed west 2.1 miles to an intersection. Turn right (north) and go 1.5 miles, past a fence and two forks. On the other side of the second fence, a boundary between BLM and DWR land, stop and walk 16 paces east to the 0-foot baseline stake.

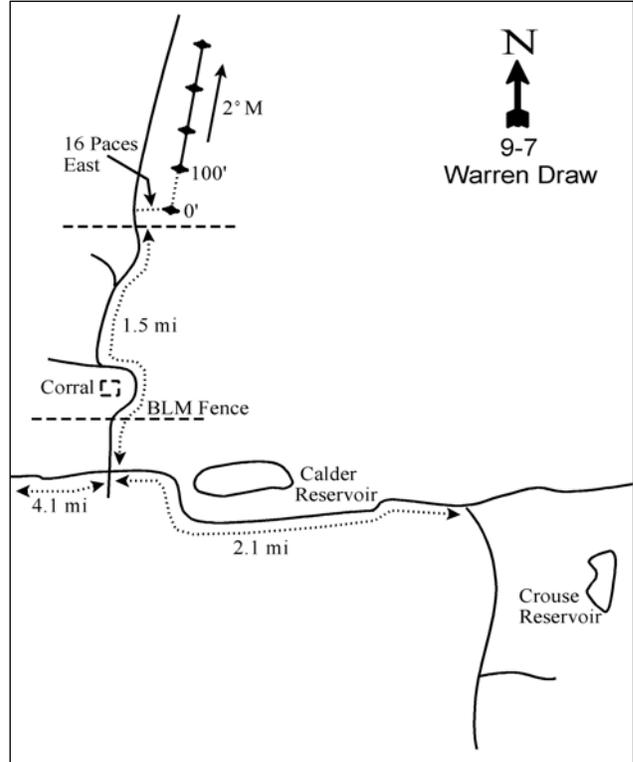
Alternative route: From the Diamond Mountain turnoff off US 191 travel east to an intersection just south of Matt Warner reservoir. Turn right toward Calder reservoir and proceed 4.1 miles to a fork. Turn left (north) at this fork and travel 1.5 miles passing through one fence and coming to another. On the other side of the second fence, a boundary between BLM and DWR land, stop and walk 16 paces east to the 0-foot baseline stake.

Map Name: Warren Draw



Township: 1S Range: 24E Section: 4

Diagrammatic Sketch:



GPS: NAD 83, UTM 12T 649578 E 4513221 N

WARREN DRAW - TREND STUDY NO. 9-7

Site Information

Site Description: The study is located on Utah Division of Wildlife Resources (UDWR) managed land just north of the UDWR-Bureau of Land Management (BLM) boundary fence in Warren Draw within the BLM's Warren Draw South allotment. The area is used year-round by deer and elk. Sage grouse also appear frequently in the area. Water is readily available in most years with several stock ponds within one mile of the site. Pellet group transect data estimated lightly moderate use by deer in 2000 and 2010, but heavy use in 2005. Estimated elk and cattle use has been light since 2000 (Table - Pellet Group Data).

Browse: The key browse species is mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) which provides essentially all of the browse cover for the site (Table - Browse Trends). The mountain big sagebrush population is comprised of a dense stand of moderately used, small, mature plants which has displayed moderate to high decadence over the sample years. Recruitment of young sagebrush plants was generally good in the initial years of the study, but has been poor since 2005. Other browse species are very rare and include small numbers of slenderbush eriogonum (*Eriogonum microthecum*), fringed sagebrush (*Artemisia frigida*) and snowberry (*Symphoricarpos oreophilus*) (Table - Browse Characteristics).

Herbaceous Understory: Even with a high density and cover of sagebrush, the herbaceous understory is abundant. Grasses are diverse, though the low growing species Sandberg bluegrass (*Poa secunda*) provides the majority of the grass cover. Other prevalent perennial grass species include mutton bluegrass (*P. fendleriana*), thickspike wheatgrass (*Agropyron dasystachyum*) and pinewoods needlegrass (*Stipa pinetorum*). Forbs are diverse and abundant, though again, forbs are dominated by the mat forming, low forage value species Hoods phlox (*Phlox hoodii*). Other prevalent species are also mainly mat forming and include rose pussytoes (*Antennaria rosea*). Species with forage value include silvery lupine (*Lupinus argenteus*), penstemon (*Penstemon* sp.) and dandelion (*Taraxacum officinale*) (Table - Herbaceous Trends).

Soil: The soil texture is a sandy clay loam with a neutral reaction (pH 6.6) (Table - Soil Analysis Data). Bare ground cover is low on the site with vegetation and litter providing good protective cover (Table - Basic Cover). The soil erosion condition was classified as stable in 2005 and 2010.

Trend Assessments

Browse:

- **1982 to 1988 - slightly up (+1):** There was a substantial increase in the density of mountain big sagebrush due to a large increase in the recruitment of young plants, but decadence also increased from 7% to 51%.
- **1988 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 mountain big sagerush decreased to 20% and recruitment of young sagebrush plants remained good at 13%.
- **1995 to 2000 - slightly up (+1):** The density of mountain big sagebrush increased by 22% from 7,320 plants/acre to 8,940 plants/acre, but cover remained similar. Decadence of sagebrush increased to 37% and poor vigor increased from 1% to 11%.
- **2000 to 2005 - slightly down (-1):** Mountain big sagebrush density decreased slightly to 8,220 plants/acre, but cover remained similar. Decadence of sagebrush increased to 42% and poor vigor increased to 20%. Recruitment of young sagebrush plants decreased from 12% to 5%.
- **2005 to 2010 - slightly down (-1):** The density of sagebrush decreased by 25% to 6,180 plants/acre with a decrease in quadrat cover from 20% to 17%. However, canopy cover showed an increase in cover from 25% to 28%. Decadence also decreased to 17% and poor vigor decreased to 11%. Recruitment of young sagebrush plants increased slightly, but was still low at 7%. There were numerous seedlings sampled in 2010.

Grass:

- **1982 to 1988 - no trend (NT):** Only quadrat frequency data for grasses are available from 1982, so no trend was given.
- **1988 to 1995 - slightly up (+1):** The sum of nested frequency of perennial grasses increased by 12%.
- **1995 to 2000 - slightly down (-1):** The perennial grass sum of nested frequency decreased by 12%, but cover remained similar.
- **2000 to 2005 - stable (0):** There was little change in the sum of nested frequency of perennial grasses. There was a significant increase in the nested frequency of Sandberg bluegrass which led to a large increase in cover from 1% to 11%.
- **2005 to 2010 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 18%, but cover remained similar.

Forb:

- **1982 to 1988 - no trend (NT):** Only quadrat frequency data for forbs are available from 1982, so no trend was given.
- **1988 to 1995 - slightly up (+1):** The sum of nested frequency of perennial forbs increased by 19%.
- **1995 to 2000 - down (-2):** The perennial forb sum of nested frequency decreased by 28% and cover decreased from 20% to 15%.
- **2000 to 2005 - slightly up (+1):** The sum of nested frequency of perennial forbs increased by 17%, though cover decreased slightly to 14%.
- **2005 to 2010 - down (-2):** There was a 45% decrease in the sum of nested frequency of perennial forbs and cover decreased slightly to 13%.

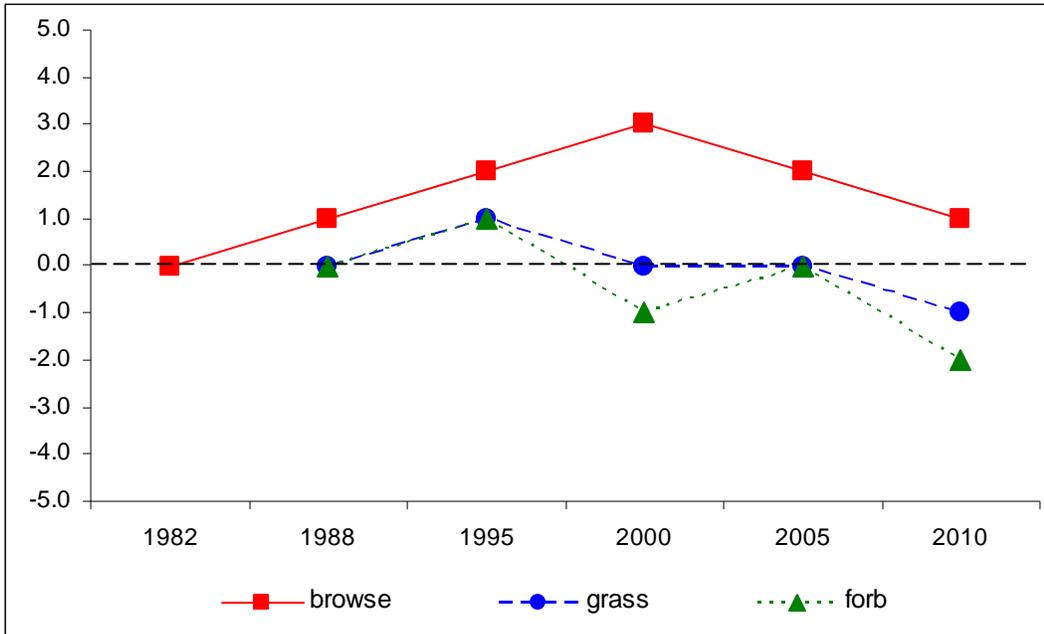
DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --

Management unit 9, study no: 7

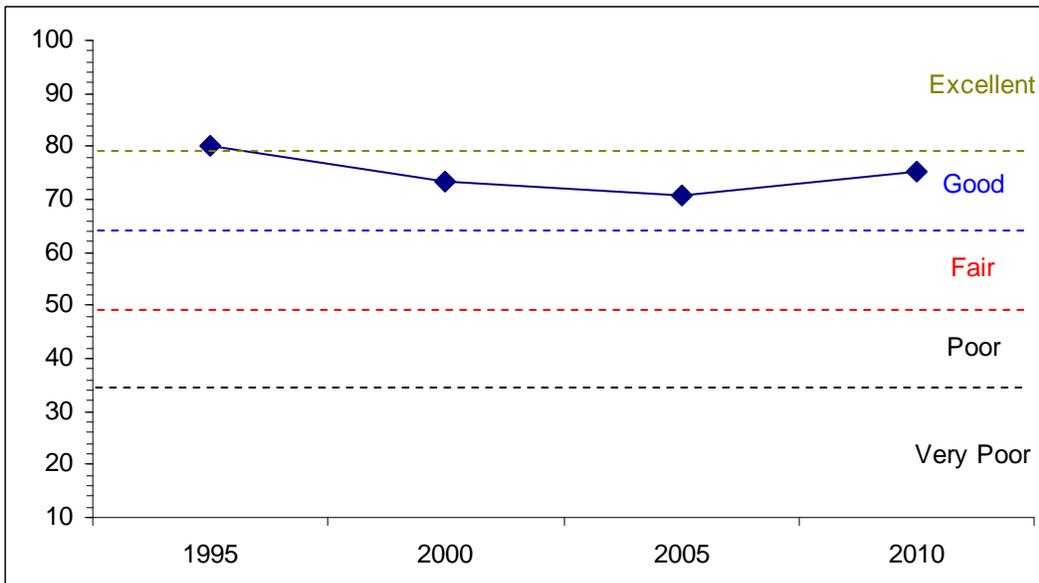
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
95	25.6	9.0	6.5	29.2	0.0	10.0	0.0	80.2	Good-Excellent
00	23.5	3.9	6.0	30.0	0.0	10.0	0.0	73.4	Good
05	25.7	2.5	2.5	30.0	0.0	10.0	0.0	70.6	Good
10	21.8	9.9	3.5	30.0	0.0	10.0	0.0	75.2	Good

Trend Summary

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



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



HERBACEOUS TRENDS--
Management unit 09, Study no: 7

Type	Species	Nested Frequency					Average Cover %			
		'88	'95	'00	'05	'10	'95	'00	'05	'10
G	Agropyron dasystachyum	a-	c265	c279	b207	b178	2.48	3.87	1.67	2.88
G	Agropyron intermedium	-	-	4	-	-	-	.15	-	-
G	Bouteloua gracilis	-	-	-	3	2	-	-	.03	.03
G	Bromus tectorum (a)	-	-	-	-	3	-	-	-	.00
G	Carex sp.	26	29	18	8	10	.14	.30	.02	.17
G	Festuca ovina	b20	c30	a-	ab1	b14	.29	-	.00	.40
G	Koeleria cristata	c51	ab9	b11	a-	a-	.04	.05	-	-
G	Poa fendleriana	ab41	b79	c153	c121	a14	1.52	5.07	4.39	.39
G	Poa pratensis	a-	ab27	a10	b36	a10	.43	.21	1.07	.16
G	Poa secunda	a89	a108	a79	b222	c283	1.08	.98	11.01	12.30
G	Sitanion hystrix	c278	b52	a13	ab42	ab36	2.23	.25	.45	.50
G	Stipa comata	bc57	c65	ab34	bc52	a15	1.72	.67	1.85	.83
G	Stipa pinetorum	b188	b177	b136	a86	a74	4.61	3.60	3.06	3.69
Total for Annual Grasses		0	0	0	0	3	0	0	0	0.00
Total for Perennial Grasses		750	841	737	778	636	14.58	15.18	23.57	21.36
Total for Grasses		750	841	737	778	639	14.58	15.18	23.57	21.37
F	Achillea millefolium	34	33	42	26	38	.34	.71	.46	1.22
F	Agoseris glauca	a-	a-	a5	b29	a-	-	.01	.14	-
F	Allium sp.	-	2	2	-	-	.01	.03	-	-
F	Androsace septentrionalis (a)	-	b36	ab18	a8	b14	.09	.04	.02	.06
F	Antennaria rosea	b191	ab189	b196	ab155	a142	5.49	6.70	3.07	4.63
F	Arabis drummondii	b24	ab7	ab4	a4	a-	.03	.01	.03	-
F	Artemisia ludoviciana	1	-	-	-	-	-	-	-	-
F	Aster sp.	15	24	23	34	31	.09	.17	.51	.36
F	Astragalus aretioides	1	1	-	-	-	.00	-	-	-
F	Chenopodium leptophyllum(a)	-	6	-	3	-	.01	-	.00	-
F	Collinsia parviflora (a)	-	b43	a7	c106	a-	.26	.01	.34	-
F	Cordylanthus sp. (a)	-	a-	a-	a-	b101	-	-	-	4.51
F	Cryptantha sp.	-	1	-	-	1	.00	-	-	.00
F	Delphinium nuttallianum	-	6	-	-	-	.03	-	.00	-
F	Descurainia pinnata (a)	1	1	-	-	3	.00	-	-	.00
F	Draba sp. (a)	-	-	3	-	-	-	.01	-	-
F	Erigeron eatonii	c136	c157	b65	b66	a21	.62	.37	.62	.10
F	Erigeron flagellaris	a-	a-	b11	a6	a3	-	.11	.03	.00
F	Gayophytum ramosissimum(a)	-	b18	a-	b23	a2	.09	-	.07	.00
F	Heterotheca villosa	-	2	-	-	-	.00	-	-	-
F	Hymenoxys richardsonii	3	3	3	-	-	.03	.03	-	-
F	Lupinus argenteus	a24	b44	a17	ab28	a15	1.44	.56	1.62	.65
F	Lychnis drummondii drummondii	-	5	-	-	-	.06	-	-	-
F	Mertensia sp.	a-	a-	a-	b8	a-	-	-	.12	-
F	Microsteris gracilis (a)	-	6	2	1	-	.02	.00	.00	-
F	Navarretia sp.	a-	b14	a-	b23	-	.08	-	.18	-

Type	Species	Nested Frequency					Average Cover %			
		'88	'95	'00	'05	'10	'95	'00	'05	'10
F	Oenothera sp.	-	-	-	3	-	-	-	.15	-
F	Orobanche sp.	-	2	-	-	-	.00	-	-	-
F	Orthocarpus luteus (a)	-	c109	b30	c106	a-	3.04	.16	1.74	-
F	Penstemon sp.	b13	a1	ab6	b10	a-	.00	.09	.18	-
F	Phlox hoodii	c234	b172	b161	ab127	a89	10.77	5.90	5.26	5.25
F	Phlox longifolia	b52	c81	ab39	ab43	a18	.34	.07	.12	.03
F	Polygonum douglasii (a)	-	b161	a12	a20	a11	.59	.03	.05	.05
F	Potentilla gracilis	-	2	6	8	8	.03	.01	.01	.04
F	Schoenocrambe linifolia	-	-	-	3	7	-	-	.00	.19
F	Sphaeralcea coccinea	-	-	-	-	6	-	-	-	.15
F	Taraxacum officinale	ab18	ab38	a16	b48	ab35	.13	.21	.66	.17
F	Tragopogon dubius	-	-	3	2	3	-	.01	.03	.01
F	Trifolium gymnocarpon	a-	c113	b41	d139	a-	.27	.23	.85	-
F	Unknown forb-annual (a)	-	3	-	-	-	.00	-	-	-
F	Unknown forb-perennial	b11	a-	a-	a-	a-	-	-	-	-
F	Zigadenus elegans	a-	ab3	b12	a-	a-	.00	.12	-	-
Total for Annual Forbs		1	383	72	267	131	4.12	0.26	2.24	4.63
Total for Perennial Forbs		757	900	652	762	417	19.82	15.39	14.11	12.83
Total for Forbs		758	1283	724	1029	548	23.94	15.65	16.35	17.47

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

BROWSE TRENDS--

Management unit 09, Study no: 7

Type	Species	Strip Frequency				Average Cover %			
		'95	'00	'05	'10	'95	'00	'05	'10
B	Artemisia frigida	0	1	1	1	-	-	-	-
B	Artemisia tridentata vaseyana	99	97	97	94	20.41	18.76	20.37	17.32
B	Eriogonum microthecum	3	3	3	3	.03	.01	.15	.09
Total for Browse		102	101	101	98	20.45	18.77	20.53	17.42

CANOPY COVER, LINE INTERCEPT--

Management unit 09, Study no: 7

Species	Percent Cover	
	'05	'10
Artemisia tridentata vaseyana	25.14	28.38

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 09, Study no: 7

Species	Average leader growth (in)	
	'05	'10
Artemisia tridentata vaseyana	1.6	1.2

BASIC COVER--

Management unit 09, Study no: 7

Cover Type	Average Cover %					
	'82	'88	'95	'00	'05	'10
Vegetation	18.25	23.00	53.39	57.93	51.55	54.37
Rock	1.25	1.50	.16	.08	.67	.39
Pavement	0	0	.07	.09	.10	.26
Litter	65.50	59.00	50.50	66.19	45.95	41.40
Cryptogams	.25	.50	1.31	1.22	.84	.68
Bare Ground	14.75	16.00	13.86	13.88	16.30	19.23

SOIL ANALYSIS DATA --

Management unit 9, Study no: 7, Study Name: Warren Draw

Effective rooting depth (in)	pH	sandy loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
12.9	6.6	63.4	16.7	19.9	2.1	20.4	265.6	0.8

PELLET GROUP DATA--

Management unit 09, Study no: 7

Type	Quadrat Frequency				Days use per acre (ha)		
	'95	'00	'05	'10	'00	'05	'10
Rabbit	3	13	67	2	-	-	-
Elk	14	21	15	4	8 (20)	13 (31)	1 (3)
Deer	10	24	39	13	22 (55)	78 (193)	19 (48)
Cattle	2	1	2	4	1 (2)	1 (2)	2 (4)

BROWSE CHARACTERISTICS--

Management unit 09, Study no: 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)	
Artemisia frigida										
82	0	0	0	-	-	0	0	0	-/-	
88	0	0	0	-	-	0	0	0	-/-	
95	0	0	0	-	-	0	0	0	-/-	
00	20	0	100	-	-	0	0	0	4/5	
05	20	0	100	-	-	0	100	0	1/2	
10	20	0	100	-	-	0	0	0	-/-	
Artemisia tridentata vaseyana										
82	3799	0	93	7	-	30	26	7	18/31	
88	10731	13	36	51	2999	63	9	9	21/25	
95	7320	13	67	20	140	30	34	1	16/29	
00	8940	12	51	37	80	25	5	11	17/29	
05	8220	5	53	42	440	31	24	20	17/24	
10	6180	7	75	17	4800	26	19	11	16/27	

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
Chrysothamnus viscidiflorus viscidiflorus									
82	0	0	0	-	-	0	0	0	-/-
88	0	0	0	-	-	0	0	0	-/-
95	0	0	0	-	-	0	0	0	-/-
00	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	6/9
10	0	0	0	-	-	0	0	0	9/13
Eriogonum microthecum									
82	0	0	0	-	-	0	0	0	-/-
88	0	0	0	-	-	0	0	0	-/-
95	100	0	100	-	-	0	0	0	4/15
00	60	0	100	-	-	0	0	67	6/9
05	120	0	100	-	-	0	0	0	5/9
10	120	0	100	-	-	0	0	0	5/9
Symphoricarpos oreophilus									
82	0	0	0	-	-	0	0	0	-/-
88	0	0	0	-	-	0	0	0	-/-
95	0	0	0	-	-	0	0	0	13/11
00	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	-/-
10	0	0	0	-	-	0	0	0	19/13
Tetradymia canescens									
82	0	0	0	-	-	0	0	0	-/-
88	0	0	0	-	-	0	0	0	-/-
95	0	0	0	-	-	0	0	0	-/-
00	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	13/36
10	0	0	0	-	-	0	0	0	13/40