

SOUTH OF DRY WASH - TREND STUDY NO. 16C-28-09

Vegetation Type: Chained, Seeded P-J

Range Type: Crucial Deer Winter, Substantial Elk Winter

NRCS Ecological Site Description: Not Available

Land Ownership: USFS

Elevation: 6,800 ft (2,073 m)

Aspect: North

Slope: 5%-7%

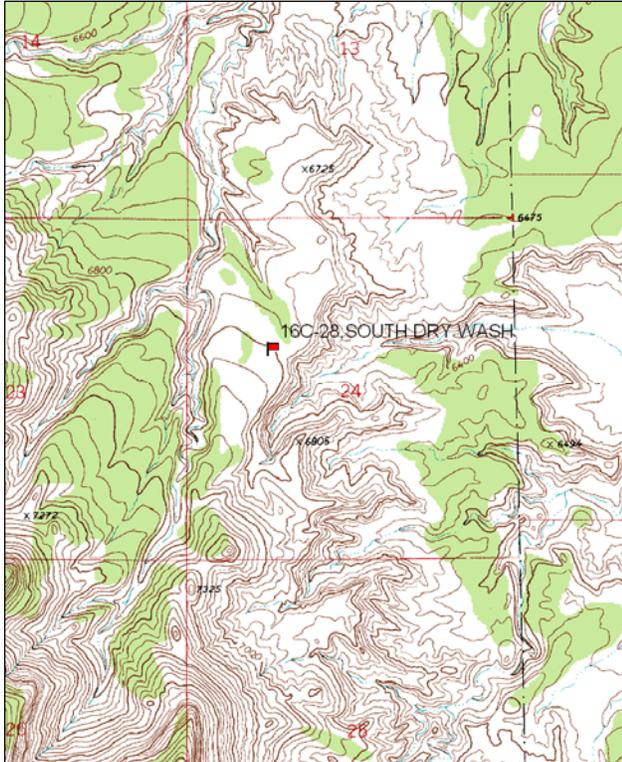
Transect bearing: 170 degrees magnetic.

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

Directions:

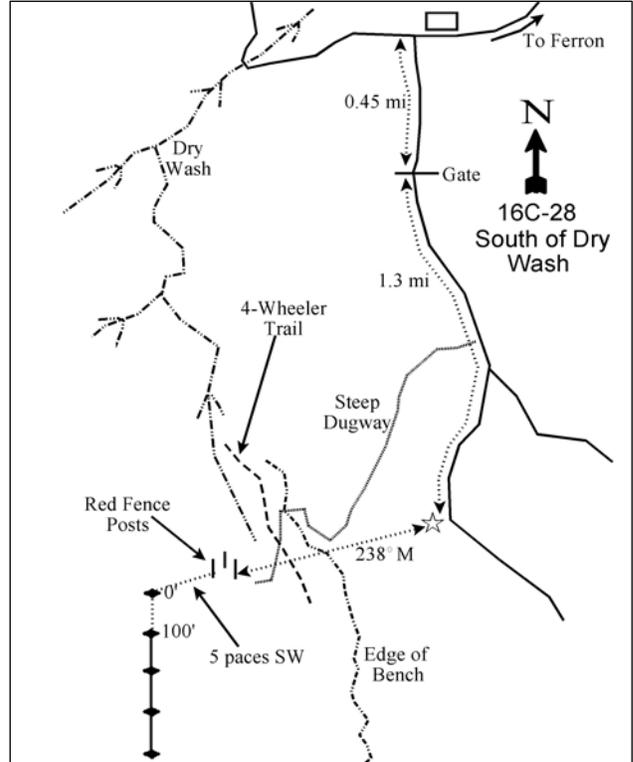
From the town of Ferron, proceed west up Canyon Road for 3.7 miles. 300 ft after the entrance to Millsite Golf Course, turn left onto a dirt road. Go south on the dirt road 0.45 miles to a gate. Continue 1.3 miles to a witness post on F.S. Road #118. From the witness post, walk up the ridge to the west. There is a game trail going to the top at a bearing of 238°M. Take this trail southwest along the edge of the chained area. The road continues up into the east edge of the chaining, where FS photo study plots and the trend study are located. The FS study is marked by tall red fenceposts. The range trend study, marked by 2 foot fenceposts, is adjacent.

Map Name: Ferron



Township: 20S, Range: 6E, Section: 24

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 482610 E 4324073 N

SOUTH OF DRY WASH - TREND STUDY NO. 16C-28

Site Information

Site Description: The study samples a chaining on a bench below Nelson Mountain, south of Dry Wash. The 35 acre chaining and seeding was done in 1972 as a Forest Service wildlife habitat enhancement project. A rather isolated site, it receives little use by cattle. The site produces an abundance of quality forage for wintering big game and appears to be used into the spring by deer. Pellet group data has indicated light to moderate use by elk and heavy use by deer since 1999 (Table - Pellet Group Data).

Browse: The site supports a variety of browse species with three preferred species, black sagebrush (*Artemisia nova*), true mountain mahogany (*Cercocarpus montanus*), and green ephedra (*Ephedra veridis*), providing a large proportion of the browse cover (Table - Browse Trends). Black sagebrush is the most numerous browse species on the site. The black sagebrush population is fairly healthy with low decadence and good vigor, but low recruitment of young plants since 1994. Black sagebrush plants have displayed moderate utilization since 1994. True mountain mahogany is one of the most preferred browse species on the site and has displayed heavy use over the study, with very high use in 2004. The true mountain mahogany population has been mostly healthy, but decadence was high in 2009. Green ephedra plants displayed moderate use in many of the sample years, but had very light utilization in 2009 (Table - Browse Characteristics).

Pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) trees have reestablished on the site and are abundant. Many of the trees are mature, but rather small. The density and average diameter of pinyon and juniper trees have remained similar since 1999 (Table - Point-Quarter Tree Data). The line intercept canopy cover of both species has also remained similar since 2004 (Table - Canopy Cover). Many of the juniper trees sampled were knocked down by the chaining, but were still living.

Herbaceous Understory: Grasses are not particularly diverse or abundant. Two native perennial grasses, Salina wildrye (*Elymus salina*) and Indian ricegrass (*Oryzopsis hymenoides*) provide almost all of the grass cover for the site. Forbs are rare, typically small, and don't offer much forage or cover (Table - Herbaceous Trends).

Soil: Soil texture is a sandy clay loam with a slightly alkaline pH. Phosphorus and potassium have a low availability for plant growth and development at only 3 ppm and 38.4 ppm, respectively (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). Bare ground cover is fairly low with good protective ground cover provided by vegetation and litter cover (Table - Basic Cover). The soil erosion condition was classified as stable in 2004 and 2009.

Trend Assessments

Browse:

- **1988 to 1994 - stable (0):** Differences in density may be related to the larger sample area used in 1994; therefore, trend was determined using other parameters. Decadence of black sagebrush increased from 11% to 30%, but decadence of true mountain mahogany decreased from 14% to 4% and poor vigor decreased from 14% to 0%.
- **1994 to 1999 - slightly up (+1):** Density of black sagebrush increased by 10% and density of true mountain mahogany increased by 14%. Decadence of black sagebrush decreased to 17% and recruitment of young plants increased slightly.
- **1999 to 2004 - slightly up (+1):** Black sagebrush and true mountain mahogany density continued to increase by 12% and 16%, respectively. Cover of black sagebrush increased from 8% to 10%.
- **2004 to 2009 - stable (0):** Density of black sagebrush increased slightly, but the density of true mountain mahogany decreased by 11%. Decadence of true mountain mahogany increased from 3% to 34%. Recruitment of mahogany decreased, but is still high. Cover of mahogany decreased from 8% to 7%.

Grass:

- **1988 to 1994 - stable (0):** There was no change in the sum of nested frequency of perennial grasses.
- **1994 to 1999 - slightly up (+1):** The sum of nested frequency of perennial grasses increased by 15%, but cover changed little.
- **1999 to 2004 - down (-2):** Perennial grass sum of nested frequency decreased by 29% and cover decreased from 9% to 3%. Most of the change came from a large decrease in the nested frequency and cover of Indian ricegrass.
- **2004 to 2009 - up (+2):** There was a 30% increase in the sum of nested frequency and cover increased to 7%. There was a significant increase in the nested frequency of crested wheatgrass.

Forb:

- **1988 to 1994 - down (-2):** Forbs are rare on the site. There was a 25% decrease in the sum of nested frequency of perennial forbs.
- **1994 to 1999 - down (-2):** Perennial forb sum of nested frequency decreased by 55% and cover decreased from 2% to less than 0.5%.
- **1999 to 2004 - up (+2):** The sum of nested frequency of perennial forbs increased by 50%, though cover continued to decrease.
- **2004 to 2009 - up (+2):** The sum of nested frequency of perennial forbs increased by 74% and cover increased to 1%. Forbs remain rare on the site.

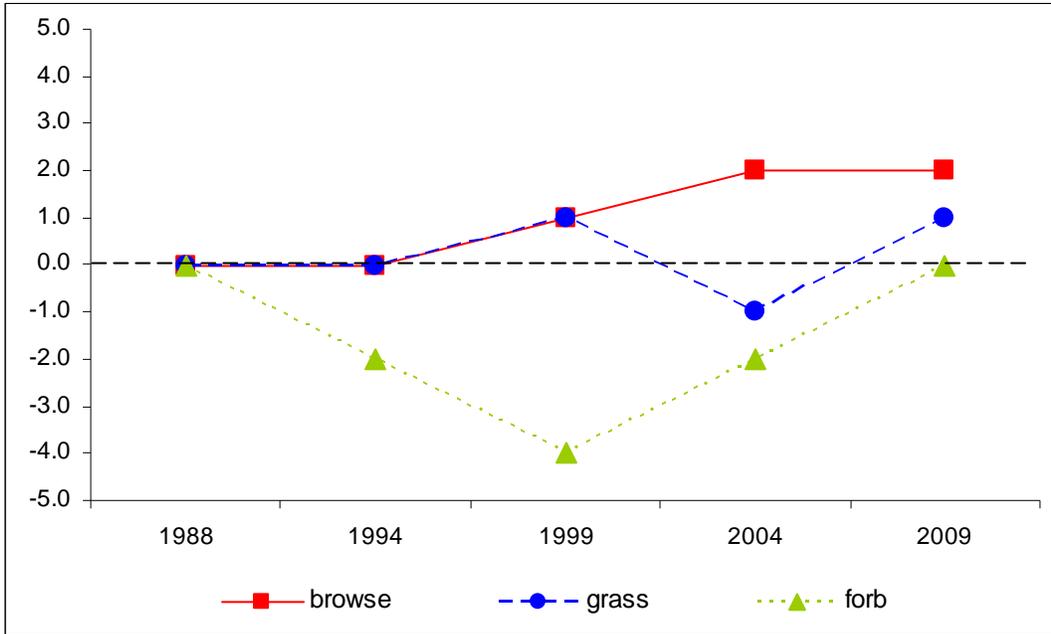
DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --

Management unit 16C, study no: 28

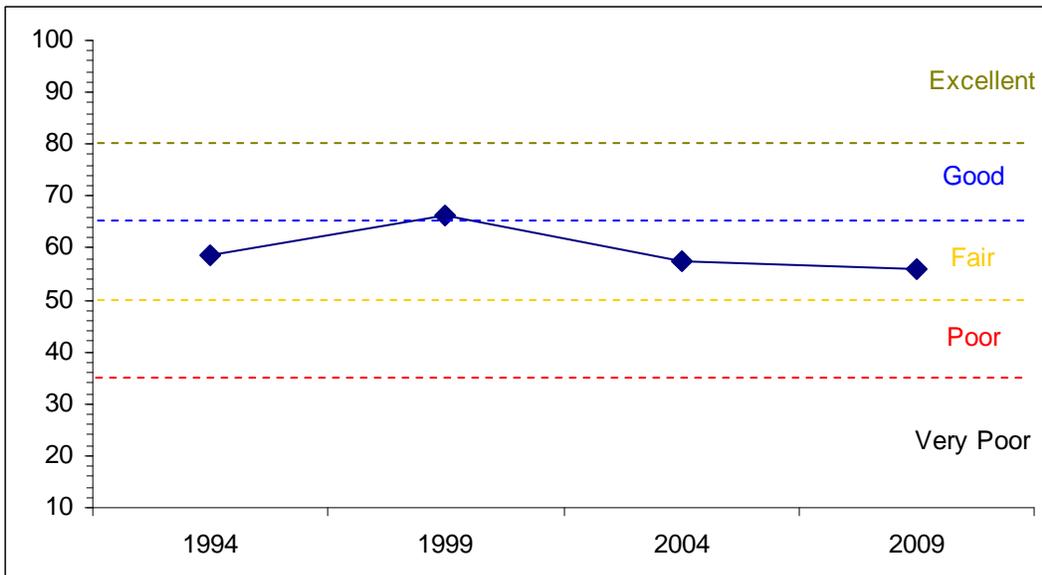
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
94	21.1	10.1	6.0	18.4	0.0	3.1	0.0	58.6	Fair
99	23.4	11.4	13.4	17.2	0.0	0.9	0.0	66.3	Fair-Good
04	27.3	12.5	10.3	6.9	0.0	0.5	0.0	57.6	Fair
09	25.0	8.6	6.6	13.6	0.0	2.1	0.0	55.9	Fair

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
 Management unit 16C Study no: 28



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL
 Management unit 16C, Study no: 28



HERBACEOUS TRENDS--

Management unit 16C, Study no: 28

Type	Species	Nested Frequency					Average Cover %			
		'88	'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron cristatum	a4	a5	a1	a13	b26	.03	.00	.10	.57
G	Bromus tectorum (a)	-	-	-	1	-	-	-	.00	-
G	Elymus junceus	-	-	-	6	1	-	-	.45	.15
G	Elymus salina	a-	c34	b30	b10	bc29	1.88	1.61	1.07	2.51
G	Oryzopsis hymenoides	116	84	113	79	79	7.11	6.82	1.72	3.48
G	Sitanion hystrix	20	17	17	7	14	.19	.16	.08	.07
Total for Annual Grasses		0	0	0	1	0	0	0	0.00	0
Total for Perennial Grasses		140	140	161	115	149	9.22	8.61	3.44	6.79
Total for Grasses		140	140	161	116	149	9.22	8.61	3.44	6.79
F	Artemisia ludoviciana	-	3	-	-	-	.00	-	-	-
F	Chenopodium fremontii (a)	-	-	-	7	-	-	-	.01	-
F	Cryptantha sp.	ab45	b52	ab29	a19	ab46	1.48	.42	.12	.48
F	Descurainia pinnata (a)	-	-	3	2	-	-	.00	.00	-
F	Eriogonum ovalifolium	4	6	2	-	-	.01	.01	-	-
F	Gilia sp. (a)	-	3	-	5	-	.00	-	.01	-
F	Lepidium sp. (a)	-	-	5	5	-	-	.06	.22	-
F	Machaeranthera canescens	2	-	-	-	-	-	-	-	-
F	Penstemon carnosus	b23	a9	a3	a2	a-	.02	.01	.00	-
F	Phlox austromontana	4	-	-	-	-	-	-	-	-
F	Schoenocrambe linifolia	a-	a-	a2	ab12	b41	-	.00	.03	.19
F	Thelesperma subnudum	b14	a2	a-	a2	a-	.00	-	.00	-
F	Thelypodopsis sagittata	b12	ab5	a-	a-	ab7	.01	-	.00	.39
F	Townsendia incana	a3	a3	a-	b19	a-	.00	-	.10	-
Total for Annual Forbs		0	3	8	19	0	0.00	0.06	0.24	0
Total for Perennial Forbs		107	80	36	54	94	1.55	0.44	0.27	1.06
Total for Forbs		107	83	44	73	94	1.55	0.50	0.51	1.06

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

BROWSE TRENDS--

Management unit 16C, Study no: 28

Type	Species	Strip Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
B	Artemisia nova	69	74	73	78	7.10	8.23	10.03	9.34
B	Cercocarpus montanus	26	26	32	27	7.46	7.96	8.09	6.80
B	Chrysothamnus nauseosus	2	0	0	0	.00	-	-	-
B	Chrysothamnus viscidiflorus	0	1	0	0	-	.00	-	-
B	Ephedra viridis	15	15	13	16	.78	.96	2.11	1.89
B	Eriogonum microthecum	21	15	20	12	.02	.01	.03	.63
B	Gutierrezia sarothrae	0	0	1	0	-	-	.00	-
B	Juniperus osteosperma	0	8	8	5	1.58	2.04	3.14	3.52
B	Opuntia polyacantha	4	4	3	4	.03	.18	.18	.15
B	Pinus edulis	0	13	10	14	4.87	5.03	4.67	6.25
Total for Browse		137	156	160	156	21.87	24.42	28.27	28.59

CANOPY COVER, LINE INTERCEPT--

Management unit 16C, Study no: 28

Species	Percent Cover		
	'99	'04	'09
Artemisia nova	-	8.64	7.36
Cercocarpus montanus	3.40	9.21	8.51
Ephedra viridis	-	2.29	1.89
Eriogonum microthecum	-	-	.01
Juniperus osteosperma	-	4.26	3.65
Opuntia polyacantha	-	-	.06
Pinus edulis	-	8.69	9.63

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 16C, Study no: 28

Species	Average leader growth (in)	
	'04	'09
Artemisia nova	1.3	0.4
Cercocarpus montanus	4.3	1.2

POINT-QUARTER TREE DATA--

Management unit 16C, Study no: 28

Species	Trees per Acre			Average diameter (in)		
	'99	'04	'09	'99	'04	'09
Juniperus osteosperma	108	144	140	3.3	3.4	2.1
Pinus edulis	185	156	165	2.0	2.4	2.3

BASIC COVER--

Management unit 16C, Study no: 28

Cover Type	Average Cover %				
	'88	'94	'99	'04	'09
Vegetation	2.25	29.27	32.51	31.79	32.76
Rock	6.00	10.97	8.50	8.25	8.14
Pavement	16.25	4.17	12.60	9.40	12.22
Litter	52.00	39.35	48.24	40.99	45.93
Cryptogams	.25	.16	.75	.48	.68
Bare Ground	23.25	24.50	19.09	28.55	19.52

SOIL ANALYSIS DATA --

Management unit 16C, Study no: 28, Study Name: South of Dry Wash

Effective rooting depth (in)	pH	sandy clay loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
13.1	7.5	54.7	21.4	23.8	3.9	3	38.4	0.7

PELLET GROUP DATA--

Management unit 16C, Study no: 28

Type	Quadrat Frequency				Days use per acre (ha)		
	'94	'99	'04	'09	'99	'04	'09
Rabbit	17	18	19	30	-	-	-
Elk	-	6	8	6	11 (27)	8 (20)	21 (53)
Deer	34	27	24	16	85 (209)	41 (101)	44 (109)
Cattle	-	-	-	1	-	-	-

BROWSE CHARACTERISTICS--

Management unit 16C, Study no: 28

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 utahensis									
88	0	0	0	-	-	0	0	0	-/-
94	0	0	0	-	-	0	0	0	6/7
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
Artemisia nova									
88	2332	36	53	11	233	19	0	3	8/17
94	3440	2	69	30	-	47	20	6	7/21
99	3800	8	74	17	20	23	2	9	8/20
04	4280	3	86	12	-	39	4	7	8/19
09	4480	1	83	15	200	13	0	11	8/20

		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>Atriplex canescens</i>										
88	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	19/20	
99	0	0	0	-	-	0	0	0	28/35	
04	0	0	0	-	-	0	0	0	21/26	
09	0	0	0	-	-	0	0	0	41/50	
<i>Cercocarpus montanus</i>										
88	232	28	57	14	1166	0	0	14	45/47	
94	540	22	74	4	-	56	15	0	52/64	
99	620	48	45	6	60	35	6	0	59/67	
04	720	47	50	3	20	11	56	0	55/74	
09	640	28	38	34	80	13	31	9	47/58	
<i>Chrysothamnus nauseosus</i>										
88	0	0	0	0	-	0	0	0	-/-	
94	40	0	50	50	-	50	50	50	11/13	
99	0	0	0	0	-	0	0	0	-/-	
04	0	0	0	0	-	0	0	0	-/-	
09	0	0	0	0	-	0	0	0	-/-	
<i>Chrysothamnus viscidiflorus</i>										
88	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	20	0	100	-	-	0	100	0	-/-	
04	0	0	0	-	-	0	0	0	9/11	
09	0	0	0	-	-	0	0	0	52/48	
<i>Ephedra viridis</i>										
88	832	20	52	28	99	4	8	4	27/22	
94	340	6	82	12	20	18	12	6	34/43	
99	340	12	71	18	-	53	12	0	39/46	
04	500	4	84	12	-	32	4	4	40/49	
09	460	22	65	13	60	0	0	9	37/49	
<i>Eriogonum microthecum</i>										
88	965	14	83	3	66	0	0	0	2/2	
94	580	3	93	3	-	3	14	3	1/3	
99	540	37	59	4	20	19	7	0	2/4	
04	600	13	87	0	-	43	10	0	2/3	
09	480	8	88	4	-	0	13	4	2/3	
<i>Gutierrezia sarothrae</i>										
88	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	-/-	
04	20	0	100	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Juniperus osteosperma</i>									
88	199	83	17	-	33	0	0	0	63/41
94	0	0	0	-	-	0	0	0	-/-
99	160	88	13	-	-	0	0	0	-/-
04	160	50	50	-	20	0	0	0	-/-
09	100	40	60	-	-	0	0	0	-/-
<i>Opuntia polyacantha</i>									
88	399	33	58	8	-	0	0	8	2/5
94	80	0	75	25	-	0	0	0	3/13
99	80	25	75	0	-	0	0	0	3/12
04	60	0	100	0	-	0	0	0	3/10
09	80	0	100	0	-	0	0	0	3/8
<i>Pinus edulis</i>									
88	399	83	17	0	166	0	0	8	44/52
94	0	0	0	0	-	0	0	0	-/-
99	260	54	46	0	40	0	0	0	-/-
04	220	36	64	0	-	0	0	0	-/-
09	280	29	64	7	20	0	0	43	-/-
<i>Sclerocactus sp.</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	5/7
<i>Yucca harrimaniae</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	9/12
09	0	0	0	-	-	0	0	0	6/10