

LOWER LOST PARK - TREND STUDY 14-16-09

Vegetation Type: Wyoming Big Sagebrush

Range Type: Crucial Deer Winter, Crucial Elk Winter

NRCS Ecological Site Description: [Upland Shallow Loam \(Pinyon-Utah Juniper\), R035XY315UT](#)

Land Ownership: BLM

Elevation: 6,700 ft (2,042 m)

Aspect: Flat

Slope: 0%-2%

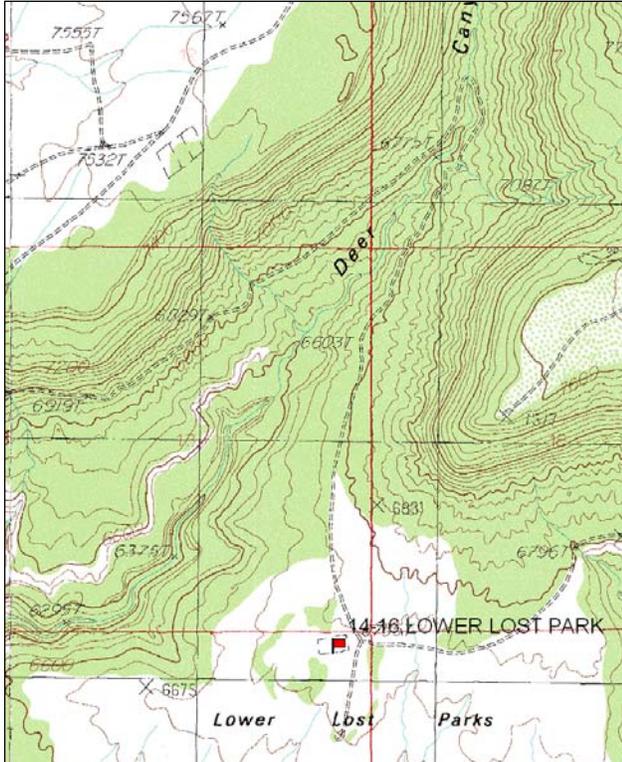
Transect bearing: 165 degrees magnetic.

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

Directions:

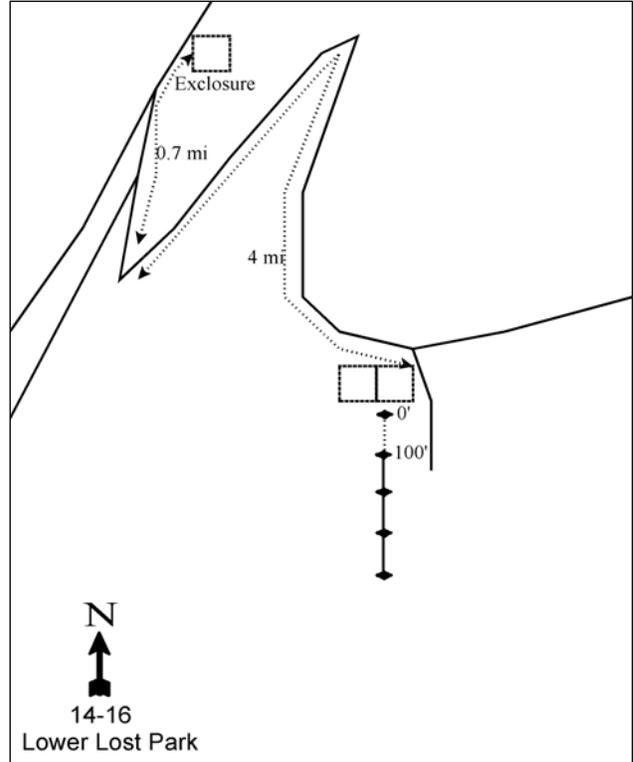
From the turnoff to the Kigalia Guard Station, proceed 2.4 miles southwest towards the Bears Ears. At the intersection, turn right and go west 2.1 miles. Go straight over the cattleguard, past a corral and continue 1.7 miles to a fork. Stay left and continue 1.5 miles to the FS/BLM boundary. Cross the cattleguard and go 2.45 miles to a fork by a stock pond. Stay right and go 0.6 miles. Stay left at this fork and continue 0.6 miles to another fork. Stay left and go 1.85 miles to an enclosure (Deer Flat enclosure and transect). Stay left at the fork by the enclosure and proceed 0.7 miles. Stay left at the forks, then drop off the rim down a tight switchback. Go just under 4 miles to an enclosure. Turn right on the road just east of the enclosure and stop after 100 feet. The transect begins 50 feet south of the center of the enclosure. All transect stakes are green fence posts. The 0-foot baseline post is tagged #7884.

Map Name: Woodenshoe Butte



Township: 36S, Range: 18E, Section: 19

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 589510 E 4167314 N

Site Information

Site Description: The study is in a Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), pinyon pine (*Pinus edulis*), and Utah juniper (*Juniperus osteosperma*) flat south of the mouth of Deer Canyon. This area is on the southwest side of Elk Ridge. The area was originally chained in 1969 and crested wheatgrass (*Agropyron cristatum*) and four-wing saltbush (*Atriplex canescens*) were seeded. In October 1986, following the establishment of this study, a herbicide treatment of tebuthiuron was applied. Edges and drainages were supposedly left untreated for wildlife use. By 1992, it appeared that the herbicide treatment was either ineffective or was not done at all because the sagebrush and juniper showed no effects of being chemically treated. The DWR pellet group transect in the area indicated light deer use averaged from 1981-86 (Jense et al. 1987), and moderate use from 1987-1992 (Jense et al. 1992) and from 1993 to 1997 (Hodson et al. 2000). Pellet group data taken on the site has indicated moderately heavy use by deer in 1999 with a decrease to light use in 2004 and 2009. Estimated elk use has been minimal since 1999 and estimated cattle use has been light since 1999 (Table - Pellet Group Data).

Browse: A moderately dense and highly decadent stand of Wyoming big sagebrush dominates the site. The density of sagebrush has steadily decreased since 1992. Decadence of sagebrush has been over 40% in every sample year with a high of 80% in 2004. The number of sagebrush plants displaying poor vigor has been over 20% in all sample years with a high of 57% in 2004. Recruitment of young sagebrush plants has been minimal over the duration of the study. As the primary browse species on the site, utilization has been moderate to heavy on sagebrush since 1986 (Table - Browse Characteristics). There is a tall, mature stand of pinyon pine and Utah juniper on the site. There was little change in the point-quarter density estimate or average diameter of either species from 2004 to 2009 (Table - Point-Quarter Tree Data).

Herbaceous Understory: The planned herbicide treatment had the objective to kill the Wyoming big sagebrush and pinyon-juniper trees in order to release the understory grasses, but the treatment apparently never took place. Grasses have decreased substantially since the outset of the study in 1986 and were rare on the site in 2009. Cheatgrass (*Bromus tectorum*) has been common during some samplings, but was not sampled in 2009. Forbs are also lacking and few species are common. Longleaf phlox (*Phlox longifolia*) is the only common perennial forb (Table - Herbaceous Trends).

Soil: The soil is a light orange loam soil with a neutral pH and a moderately deep effective rooting depth. Phosphorus and potassium have limited availability for plant growth and development at 3.3 ppm and 44.8 ppm, respectively (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). Vegetation cover is scattered, leaving large bare interspaces that are very susceptible to erosion. The average bare ground cover is high and has been increasing since 1992 (Table - Basic Cover). The soil erosion condition was classified as slight in 2004 primarily due to pedestaling of plants and gullies. The erosion condition was classified as moderate in 2009 due to pedestaling, gullies, and flow patterns and litter and soil movement from a recent storm.

Trend Assessments

Browse:

- **1986 to 1992 - stable (0):** Differences in density may be related to the larger sample area used in 1992; therefore, trend was determined using other parameters. Decadence and recruitment of young plants of the primary browse species, Wyoming big sagebrush, increased slightly.
- **1992 to 1999 - down (-2):** The density of sagebrush decreased by 45% from 8,600 plants/acre to 4,740 plants/acre and cover decreased from 18% to 15%. Decadence decreased from 69% to 47%, but poor vigor increased from 24% to 33%. Recruitment of young sagebrush plants remains poor.
- **1999 to 2004 - down (-2):** Density of sagebrush decreased only slightly to 4,560 plants/acre and cover remained similar. However, decadence of sagebrush increased to 80% and poor vigor increased to 57%. There was no new recruitment of young sagebrush plants in 2004.

- **2004 to 2009 - stable (0):** There was a 10% decrease in the density of sagebrush to 4,100 plants/acre, though decadence decreased substantially to 42% and poor vigor decreased to 22%.

Grass:

- **1986 to 1992 - down (-2):** There was a 42% decrease in the sum of nested frequency of perennial grasses with a significant decrease in bottlebrush squirreltail (*Sitanion hystrix*) and mutton bluegrass (*Poa fendleriana*).
- **1992 to 1999 - stable (0):** There was a slight increase in the sum of nested frequency and cover of perennial grasses. However, there was a significant increase in the nested frequency of the annual grasses, sixweeks fescue (*Vulpia octoflora*) and cheatgrass, and cover increased from less than 1% to 2%.
- **1999 to 2004 - down (-2):** The sum of nested frequency of perennial grasses decreased by 68% and cover decreased to less than 1%. There was a significant decrease in bottlebrush squirreltail and needle-and-thread (*Stipa comata*) nested frequency. The nested frequency of the two annual species, cheatgrass and sixweeks fescue, also decreased significantly.
- **2004 to 2009 - down (-2):** There was a substantial decrease in the sum of nested frequency of perennial grasses and cover decreased to around 0.1%. Only two species, Indian ricegrass (*Oryzopsis hymenoides*) and bottlebrush squirreltail, provided any measurable cover. Neither of the two annual species was sampled.

Forb:

- **1986 to 1992 - stable (0):** There was little change in the sum of nested frequency of perennial forbs, but composition changed slightly with a significant decrease in the nested frequency of hoary aster (*Machaeranthera canescens*) and a significant increase in longleaf phlox.
- **1992 to 1999 - stable (0):** The sum of nested frequency and cover of perennial forbs changed little.
- **1999 to 2004 - down (-2):** The sum of nested frequency of perennial forbs decreased by 41% and cover decreased from 3% to 1%. There was a significant decrease in the nested frequency of longleaf phlox and low fleabane (*Erigeron pumilus*).
- **2004 to 2009 - down (-2):** There was a 28% decrease in the sum of nested frequency of perennial forbs, though cover increased to 3%. The increase in cover came from a large increase of timber poisonvetch (*Astragalus convallarius*).

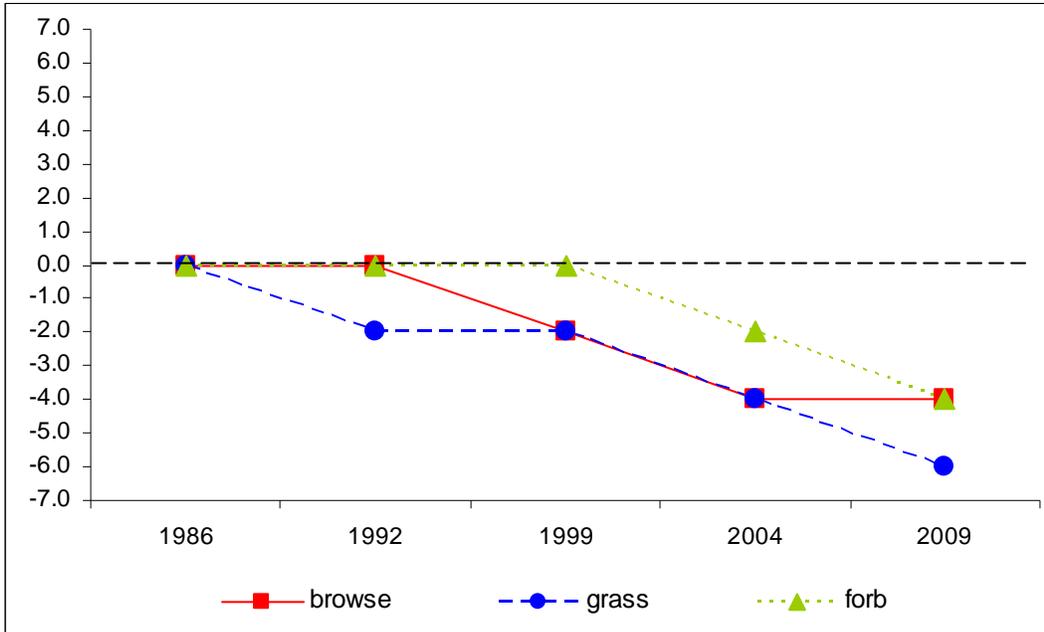
DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 14, study no: 16

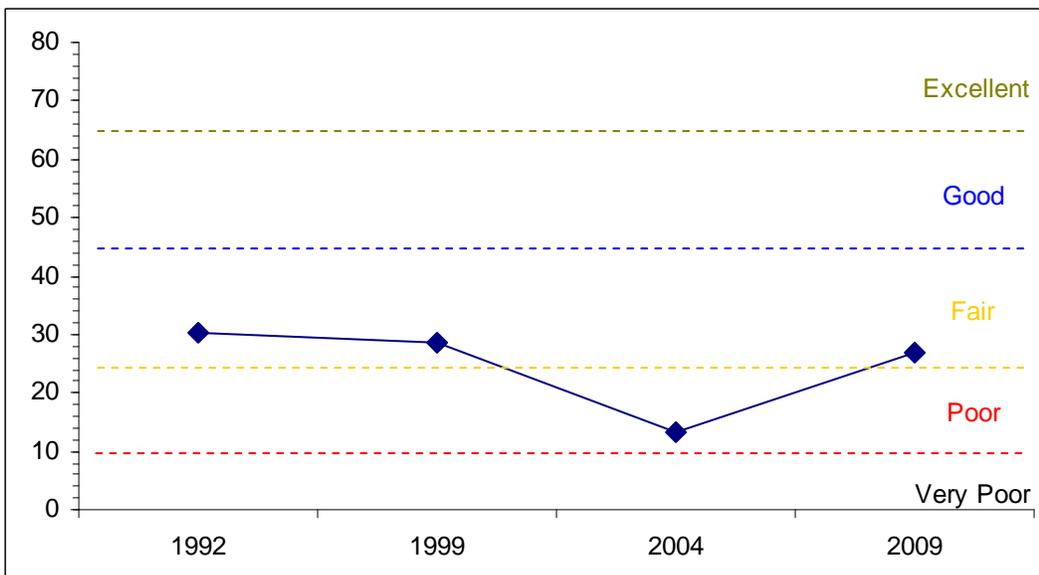
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
92	22.5	-5.4	0.9	3.3	-0.2	9.2	0.0	30.3	Fair
99	18.9	1.2	0.0	3.6	-1.6	6.6	0.0	28.7	Fair
04	18.8	-9.0	0.0	1.3	-0.6	2.8	0.0	13.3	Poor
09	16.9	2.4	0.5	0.2	0.0	6.9	0.0	27.0	Fair

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 14, Study no: 16



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE
Management unit 14, Study no: 16



HERBACEOUS TRENDS--
Management unit 14, Study no: 16

Type	Species	Nested Frequency					Average Cover %			
		'86	'92	'99	'04	'09	'92	'99	'04	'09
G	Agropyron cristatum	11	2	10	1	2	.01	.10	.00	.00
G	Bouteloua gracilis	a-	b16	b18	ab9	a-	.22	.12	.01	-
G	Bromus tectorum (a)	-	-	c116	b21	a-	-	.86	.19	-
G	Oryzopsis hymenoides	ab26	b41	a14	ab28	a11	.35	.09	.52	.07
G	Poa fendleriana	b47	a-	a-	a-	a-	-	-	-	-
G	Sitanion hystrix	c157	b72	b89	a7	a3	.78	1.28	.06	.03
G	Sporobolus cryptandrus	-	-	-	-	3	-	-	-	.00
G	Stipa comata	ab18	ab20	b34	a8	a2	.26	.22	.04	.00
G	Vulpia octoflora (a)	-	b70	c135	b47	a-	.21	1.26	.61	-
Total for Annual Grasses		0	70	251	68	0	0.20	2.13	0.80	0
Total for Perennial Grasses		259	151	165	53	21	1.64	1.82	0.64	0.12
Total for Grasses		259	221	416	121	21	1.85	3.96	1.44	0.12
F	Arabis sp.	-	-	4	-	-	-	.01	-	-
F	Astragalus convallarius	95	87	75	60	81	.96	.79	.39	2.91
F	Calochortus nuttallii	-	11	-	-	-	.02	-	-	-
F	Cordylanthus wrightii (a)	a13	c157	a1	a2	b63	6.91	.00	.01	1.11
F	Descurainia pinnata (a)	-	-	2	-	-	-	.00	-	-
F	Erigeron pumilus	b25	ab19	c52	a5	a5	.16	.77	.04	.01
F	Eriogonum racemosum	-	-	2	-	1	-	.00	-	.00
F	Lesquerella sp.	-	2	-	-	-	.00	-	-	-
F	Machaeranthera canescens	c36	a6	a3	a10	a-	.02	.00	.05	-
F	Madia glomerata (a)	-	-	1	5	-	-	.00	.04	-
F	Microsteris gracilis (a)	-	-	-	3	-	-	-	.03	-
F	Penstemon comarrhenus	c53	bc36	ab19	a4	a5	1.29	.12	.01	.04
F	Phlox hoodii	-	-	-	-	1	-	-	-	.00
F	Phlox longifolia	c207	d259	d253	c157	a86	2.03	1.49	.79	.47
F	Sphaeralcea coccinea	b33	ab12	ab19	ab22	a7	.11	.08	.13	.02
F	Townsendia sp.	-	4	2	-	-	.01	.00	-	-
F	Unknown forb-annual (a)	-	2	-	-	-	.00	-	-	-
F	Unknown forb-perennial	2	-	-	-	-	-	-	-	-
Total for Annual Forbs		13	159	4	10	63	6.92	0.01	0.08	1.11
Total for Perennial Forbs		451	436	429	258	186	4.62	3.28	1.41	3.47
Total for Forbs		464	595	433	268	249	11.54	3.30	1.50	4.59

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

BROWSE TRENDS--

Management unit 14, Study no: 16

Type	Species	Strip Frequency				Average Cover %			
		'92	'99	'04	'09	'92	'99	'04	'09
B	Artemisia tridentata wyomingensis	95	93	87	88	17.77	14.76	15.07	13.56
B	Chrysothamnus depressus	11	3	3	1	.04	.30	.00	.00
B	Chrysothamnus viscidiflorus	0	3	0	1	-	.00	-	.00
B	Eriogonum microthecum	4	4	1	0	.18	.03	.00	-
B	Gutierrezia sarothrae	0	0	2	2	-	.00	.03	.15
B	Juniperus osteosperma	4	5	5	5	.56	.33	.74	.71
B	Opuntia sp.	1	3	1	4	.00	.00	.01	.01
B	Pinus edulis	10	6	5	6	6.81	7.19	5.65	4.15
Total for Browse		125	117	104	107	25.37	22.63	21.52	18.59

CANOPY COVER, LINE INTERCEPT--

Management unit 14, Study no: 16

Species	Percent Cover		
	'99	'04	'09
Artemisia tridentata wyomingensis	-	10.78	15.51
Chrysothamnus depressus	-	.13	-
Gutierrezia sarothrae	-	-	.10
Juniperus osteosperma	-	2.86	1.96
Opuntia sp.	-	.11	-
Pinus edulis	6.00	10.16	9.08

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 14, Study no: 16

Species	Average leader growth (in)	
	'04	'09
Artemisia tridentata wyomingensis	1.3	1.5

POINT-QUARTER TREE DATA--

Management unit 14, Study no: 16

Species	Trees per Acre			Average diameter (in)		
	'99	'04	'09	'99	'04	'09
Juniperus osteosperma	36	37	35	2.8	3.3	3.1
Pinus edulis	80	78	84	3.0	4.4	4.0

BASIC COVER--

Management unit 14, Study no: 16

Cover Type	Average Cover %				
	'86	'92	'99	'04	'09
Vegetation	3.25	32.20	27.01	22.48	23.39
Rock	0	.01	.00	0	.03
Pavement	0	0	0	.01	0
Litter	28.25	29.35	31.84	31.78	26.19
Cryptogams	2.00	2.19	3.28	3.55	4.27
Bare Ground	66.50	46.18	48.67	53.32	58.07

SOIL ANALYSIS DATA --

Management unit 14, Study no: 16, Study Name: Lower Lost Park

Effective rooting depth (in)	pH	loam			%0M	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
14.5	6.9	44	32.2	23.8	1	3.3	44.8	0.5

PELLET GROUP DATA--

Management unit 14, Study no: 16

Type	Quadrat Frequency				Days use per acre (ha)		
	'92	'99	'04	'09	'99	'04	'09
Rabbit	44	60	34	31	-	-	-
Elk	-	1	-	-	1 (2)	2 (5)	1 (2)
Deer	49	39	15	5	56 (138)	23 (58)	16 (40)
Cattle	3	-	-	2	7 (17)	8 (20)	8 (20)

BROWSE CHARACTERISTICS--

Management unit 14, Study no: 16

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
Artemisia tridentata wyomingensis									
86	7399	0	37	63	-	35	49	24	20/19
92	8600	1	30	69	20	42	25	24	-/-
99	4740	0	53	47	-	38	38	33	19/29
04	4560	0	20	80	-	57	2	57	18/28
09	4100	1	57	42	40	59	15	22	18/26
Chrysothamnus depressus									
86	265	25	75	0	-	0	0	0	6/6
92	260	31	69	0	-	62	8	0	-/-
99	80	0	100	0	-	0	50	0	8/11
04	60	0	33	67	-	33	33	33	2/7
09	40	0	50	50	-	0	0	50	5/7

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									
86	0	0	0	0	-	0	0	0	-/-
92	0	0	0	0	-	0	0	0	-/-
99	60	0	67	33	-	0	0	33	13/15
04	0	0	0	0	-	0	0	0	11/8
09	40	50	50	0	-	0	0	0	9/4
Eriogonum microthecum									
86	0	0	0	-	-	0	0	0	-/-
92	120	67	33	-	20	0	0	0	-/-
99	80	0	100	-	-	25	0	0	3/7
04	20	0	100	-	-	0	100	0	2/2
09	0	0	0	-	-	0	0	0	-/-
Gutierrezia sarothrae									
86	0	0	0	-	-	0	0	0	-/-
92	0	0	0	-	-	0	0	0	-/-
99	0	0	0	-	40	0	0	0	-/-
04	80	25	75	-	-	0	0	0	6/6
09	100	0	100	-	-	0	0	0	8/9
Juniperus osteosperma									
86	0	0	0	0	-	0	0	0	-/-
92	80	50	50	0	-	0	0	0	-/-
99	100	80	20	0	-	0	0	0	-/-
04	100	60	20	20	-	0	0	0	-/-
09	100	40	60	0	-	0	0	0	-/-
Opuntia sp.									
86	66	0	100	-	-	0	0	0	8/12
92	20	0	100	-	-	0	0	0	-/-
99	80	25	75	-	-	0	0	0	9/27
04	20	0	100	-	-	0	0	0	7/33
09	120	50	50	-	-	0	0	0	3/3
Pinus edulis									
86	0	0	0	0	-	0	0	0	-/-
92	200	50	40	10	-	0	0	0	-/-
99	120	33	67	0	20	0	0	0	-/-
04	100	20	80	0	20	0	0	0	-/-
09	120	50	50	0	20	0	0	0	-/-