

POISON SPRING BENCH - TREND STUDY NO. 16B-22-09

Vegetation Type: Chained, Seeded P-J

Range Type: Crucial Deer Winter, Crucial Elk Winter

NRCS Ecological Site Description: Upland Stony Loam (Pinyon-Utah Juniper), R034XY330UT

Land Ownership: SITLA

Elevation: 7,000 ft (2,134 m)

Aspect: East

Slope: 3%-5%

Transect bearing: 165 degrees magnetic

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

Directions:

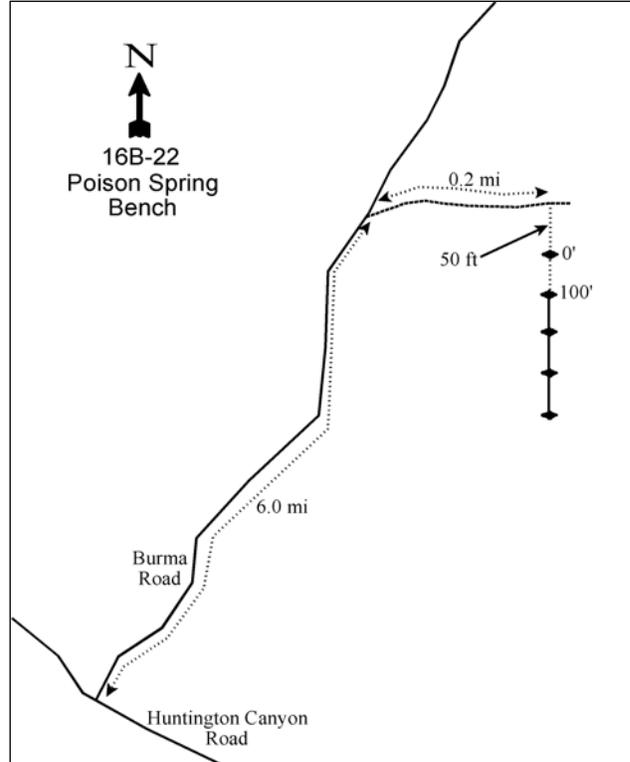
To reach Poison Spring Bench, go up the Huntington Canyon Road to the Huntington research farm below the power plant. Across from the farm gate, turn right onto the Burma Road. Follow the Burma Road for 6 miles. Turn right onto a faint road that goes into the chaining below the road. Go down along the edge of the chaining for 0.2 miles to the study site. The zero-foot witness post is about 50 feet off the road, and the transect runs south.

Map Name: Hiawatha



Township: 16S, Range: 8E, Section: 22

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 498919 E 4362735 N

## POISON SPRING BENCH - TREND STUDY NO. 16B-22

### Site Information

Site Description: The study is located south of Cedar Creek and southwest of Poison Spring Bench. This area is managed by the BLM and is part of the North Huntington cattle allotment which is grazed in the spring and fall. The site was chained and seeded in the late 1960's. The area is now dominated by black sagebrush (*Artemisia nova*) with several released pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) trees. Pellet group data indicated light deer use in 1999 and 2004, but more moderate use by deer in 2009. Estimated elk use has been light to lightly moderate since 1999. Estimated cattle use has been light since 1999 (Table - Pellet Group Data).

Browse: Browse species dominate this site providing the majority of the vegetation cover. The dominant species on the site is black sagebrush which has provided an average cover of 21% since 1994 (Table - Browse Trends). The black sagebrush population is mostly mature with low decadence and good vigor. Recruitment of young black sagebrush plants has steadily decreased since 1994 with no young plants being sampled in 2009. Utilization of black sagebrush has been mostly light with some moderate use (Table - Browse Characteristics).

Other desirable browse species occur on the site in low densities. These include Utah serviceberry (*Amelanchier utahensis*), true mountain mahogany (*Cercocarpus monatanus*), green ephedra (*Ephedra veridis*), and four-wing saltbush (*Atriplex canescens*). True mountain mahogany, four-wing saltbush, and serviceberry have all been heavily browsed. Some of the pinyon and juniper trees that survived the chaining have matured and increased in size since the chaining. Point-quarter density estimates have shown fairly stable populations of both pinyon and juniper on the site (Table - Point-Quarter Tree Data).

Herbaceous Understory: Herbaceous abundance and diversity is extremely low. Crested wheatgrass (*Agropyron cristatum*) is the only grass sampled with any notable frequency or cover. There was a large decrease in the nested frequency and cover of crested wheatgrass between the 1999 and 2004 sample years. This large decrease in crested wheatgrass is attributed to drought conditions in years prior to the 2004 sample year. Most of the crested wheatgrass plants were sampled in the shelter of shrubs. Forbs have been rare on the site since the study began with forb cover less than 1% since 1988. The most prevalent forb is basin yellow crypstantha (*Cryptantha confertiflora*) (Table - Herbaceous Trends).

Soil: The soil is a gravelly, sandy clay loam with a slightly alkaline pH and a moderately shallow effective rooting depth. Phosphorus and potassium both have a low availability for plant growth and development at 4.4 ppm and 57.6 ppm, respectively (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). The majority of the protective ground cover comes from litter cover, but rock and pavement cover is also high on the site. Bare ground cover is moderately low on the site (Table - Basic Cover). The soil erosion condition was classified as stable in 2004 and slight in 2009 due primarily to pedestaling of plants, flow patterns, and soil movement.

### Trend Assessments

#### Browse:

- **1988 to 1994 - slightly down (-1):** Differences in density may be related to the larger sample area used in 1994; therefore, trend was determined using other parameters. The primary browse species, black sagebrush increased slightly in decadence and poor vigor. Recruitment of young sagebrush plants decreased substantially.
- **1994 to 1999 - slightly up (+1):** Density of black sagebrush increased 15% from 9,740 plants/acre to 11,200 plants/acre, though there was little change in cover. Decadence of sagebrush decreased

slightly, but recruitment of young sagebrush plants also decreased. The density of mountain mahogany increased slightly as did cover.

- **1999 to 2004 - stable (0):** There was a slight decrease in the density of black sagebrush, though cover increased slightly. Decadence of sagebrush increased to 15% and recruitment of young black sagebrush decreased to 2%.
- **2004 to 2009 - slightly down (-1):** The density of black sagebrush decreased by 17% from 10,700 plants/acre to 8,860 plants/acre, though cover remained similar. Decadence increased to 19% and poor vigor increased from 7% to 12%. There were no young sagebrush plants sampled.

Grass:

- **1988 to 1994 - slightly down (-1):** There was an 11% decrease in the sum of nested frequency of perennial grasses. Crested wheatgrass is the only common grass species on the site.
- **1994 to 1999 - slightly up (+1):** The sum of nested frequency of perennial grasses increased by 14% and cover increased slightly.
- **1999 to 2004 - down (-2):** There was a significant decrease in nested frequency of the dominant grass, crested wheatgrass, and cover of perennial grasses decreased from 3% to less than 0.5%.
- **2004 to 2009 - stable (0):** There was little change in the sum of nested frequency of perennial grasses and cover remained less than 1%.

Forb:

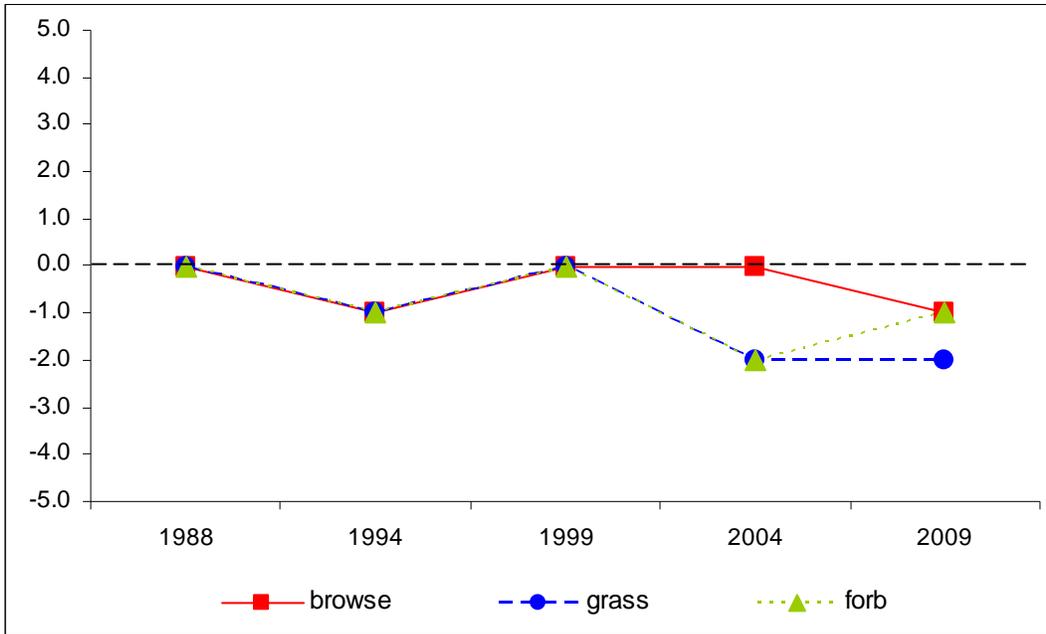
- **1988 to 1994 - slightly down (-1):** Forbs are rare on this site. The sum of nested frequency of perennial forbs decreased by 25% with a significant decrease in the nested frequency of skyrocket gilia (*Ipomopsis aggregate*) and fleshy beardtongue (*Penstemon carnosus*).
- **1994 to 1999 - slightly up (+1):** The sum of nested frequency of perennial forbs increased to near 1988 levels, though cover decreased slightly.
- **1999 to 2004 - down (-2):** The sum of nested frequency of perennial forbs decreased by 58% and cover decreased slightly. There was a significant decrease in the nested frequency of mat penstemon (*Penstemon caespitosus*).
- **2004 to 2009 - slightly up (+1):** The cover and sum of nested frequency of perennial forbs increased slightly.

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 16B, study no: 22

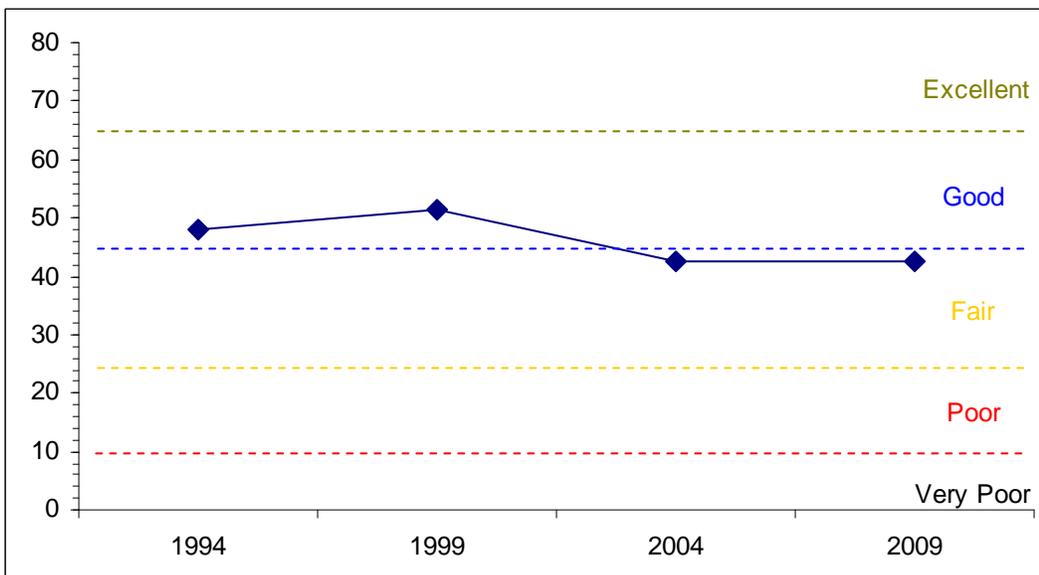
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
94	26.7	10.7	4.2	4.7	0.0	1.5	0.0	<b>47.9</b>	Good
99	29.1	12.7	2.4	6.0	0.0	1.1	0.0	<b>51.3</b>	Good
04	30.0	10.5	1.2	0.3	0.0	0.7	0.0	<b>42.7</b>	Fair
09	30.0	9.4	1.2	1.1	0.0	1.0	0.0	<b>42.7</b>	Fair

## Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--  
Management unit 16B, Study no: 22



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE  
Management unit 16B, Study no: 22



HERBACEOUS TRENDS--

Management unit 16B, Study no: 22

Type	Species	Nested Frequency					Average Cover %			
		'88	'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron cristatum	<sub>b</sub> 172	<sub>b</sub> 143	<sub>b</sub> 175	<sub>a</sub> 30	<sub>a</sub> 37	2.30	2.82	.14	.56
G	Elymus junceus	-	-	3	-	-	-	.15	-	-
G	Oryzopsis hymenoides	-	1	-	-	-	.00	-	-	-
G	Sitanion hystrix	6	11	2	3	1	.02	.03	.00	.00
G	Stipa comata	-	3	-	-	-	.00	-	-	-
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		178	158	180	33	38	2.34	3.00	0.14	0.56
Total for Grasses		178	158	180	33	38	2.34	3.00	0.14	0.56
F	Arabis sp.	4	12	9	-	1	.05	.01	-	.00
F	Castilleja linariaefolia	-	-	2	-	2	-	.03	-	.01
F	Cirsium sp.	5	-	-	-	-	-	-	-	-
F	Cruciferae	8	-	-	-	-	-	-	-	-
F	Cryptantha confertiflora	<sub>ab</sub> 44	<sub>b</sub> 51	<sub>ab</sub> 46	<sub>a</sub> 18	<sub>ab</sub> 33	.56	.28	.22	.27
F	Descurainia pinnata (a)	-	1	6	5	-	.00	.01	.01	-
F	Eriogonum cernuum (a)	-	5	-	9	3	.01	-	.01	.00
F	Ipomopsis aggregata	<sub>b</sub> 9	<sub>a</sub> 1	<sub>ab</sub> 8	<sub>ab</sub> 4	<sub>a</sub> 3	.00	.04	.01	.00
F	Lappula occidentalis (a)	-	-	-	4	-	-	-	.01	-
F	Lepidium montanum	2	6	-	7	6	.04	-	.01	.06
F	Machaeranthera spp	-	-	-	3	-	-	-	.03	-
F	Medicago sativa	3	-	3	-	-	-	.00	-	-
F	Penstemon caespitosus	<sub>b</sub> 18	<sub>b</sub> 19	<sub>b</sub> 29	<sub>a</sub> -	<sub>a</sub> -	.11	.09	-	-
F	Penstemon carnosus	<sub>b</sub> 22	<sub>a</sub> -	<sub>a</sub> 9	<sub>ab</sub> 14	<sub>ab</sub> 16	-	.04	.06	.03
F	Salsola iberica (a)	-	<sub>b</sub> 13	<sub>a</sub> -	<sub>a</sub> 2	<sub>a</sub> -	.07	-	.00	-
F	Schoenrambe linifolia	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> 2	<sub>a</sub> 1	<sub>b</sub> 9	-	.00	.00	.06
F	Senecio multilobatus	4	-	5	-	1	-	.01	-	.03
F	Townsendia sp.	-	-	-	-	1	-	-	-	.00
Total for Annual Forbs		0	19	6	20	1	0.09	0.01	0.03	0.00
Total for Perennial Forbs		119	89	113	47	74	0.77	0.54	0.34	0.49
Total for Forbs		119	108	119	67	75	0.87	0.56	0.38	0.49

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

BROWSE TRENDS--

Management unit 16B, Study no: 22

Type	Species	Strip Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
B	Artemisia nova	97	98	97	95	19.75	19.35	22.97	21.48
B	Cercocarpus montanus	10	14	14	16	1.14	3.25	2.56	2.45
B	Ephedra viridis	4	7	8	8	.18	.00	.38	.15
B	Eriogonum microthecum	13	12	16	12	.06	.04	.09	.06
B	Gutierrezia sarothrae	0	4	2	1	-	.00	.00	.00
B	Juniperus osteosperma	0	3	3	4	1.78	2.67	3.05	3.17
B	Opuntia polyacantha	5	5	5	2	.00	.03	.03	.00
B	Pinus edulis	0	4	6	3	1.03	.85	2.32	3.30
B	Purshia tridentata	1	0	0	0	.03	-	-	-
Total for Browse		130	147	151	141	24.00	26.20	31.42	30.63

CANOPY COVER, LINE INTERCEPT--

Management unit 16B, Study no: 22

Species	Percent Cover		
	'99	'04	'09
Artemisia nova	-	23.75	23.33
Cercocarpus montanus	-	2.83	3.31
Ephedra viridis	-	1.21	1.14
Eriogonum microthecum	-	.01	.03
Juniperus osteosperma	1.39	2.73	2.71
Pinus edulis	-	3.34	4.56

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 16B, Study no: 22

Species	Average leader growth (in)	
	'04	'09
Artemisia nova	0.7	-
Cercocarpus montanus	3.1	1.4

POINT-QUARTER TREE DATA--

Management unit 16B, Study no: 22

Species	Trees per Acre			Average diameter (in)		
	'99	'04	'09	'99	'04	'09
Juniperus osteosperma	43	56	52	3.0	5.8	4.3
Pinus edulis	103	111	110	2.1	2.9	3.5

BASIC COVER--

Management unit 16B, Study no: 22

Cover Type	Average Cover %				
	'88	'94	'99	'04	'09
Vegetation	6.00	26.07	29.60	33.03	31.70
Rock	12.25	9.63	9.84	11.06	10.06
Pavement	7.00	4.24	8.36	8.55	13.21
Litter	56.75	38.77	41.91	38.04	40.73
Cryptogams	0	.01	1.03	.03	.72
Bare Ground	18.00	22.43	23.83	21.89	22.03

SOIL ANALYSIS DATA --

Management unit 16B, Study no: 22, Study Name: Poison Spring Bench

Effective rooting depth (in)	pH	sandy clay loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
12.3	7.6	50.7	27.4	21.8	3.9	4.4	57.6	0.8

PELLET GROUP DATA--

Management unit 16B, Study no: 22

Type	Quadrat Frequency				Days use per acre (ha)		
	'94	'99	'04	'09	'99	'04	'09
Rabbit	26	18	10	15	-	-	-
Elk	7	6	7	4	8 (20)	19 (46)	3 (7)
Deer	24	24	7	19	13 (32)	5 (12)	21 (53)
Cattle	7	5	2	-	15 (36)	7 (16)	3 (7)

BROWSE CHARACTERISTICS--

Management unit 16B, Study no: 22

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>Amelanchier utahensis</b>									
88	0	0	0	-	-	0	0	0	-/-
94	0	0	0	-	-	0	0	0	17/21
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	28/33
<b>Artemisia nova</b>									
88	15331	78	17	5	1399	9	0	.86	9/19
94	9740	9	76	15	-	9	.41	5	10/27
99	11200	4	88	9	80	26	0	3	9/20
04	10700	2	83	15	60	10	10	7	10/22
09	8860	0	81	19	40	8	0	12	9/22

		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	40/37	
99	0	0	0	-	-	0	0	0	52/41	
04	0	0	0	-	-	0	0	0	36/48	
09	0	0	0	-	-	0	0	0	48/39	
<i>Atriplex confertifolia</i>										
88	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	20/25	
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	
<i>Cercocarpus montanus</i>										
88	0	0	0	0	-	0	0	0	-/-	
94	300	0	93	7	-	20	7	0	33/38	
99	400	10	90	0	60	5	70	0	36/47	
04	320	6	81	13	20	31	63	13	35/43	
09	360	22	61	17	40	22	44	0	35/46	
<i>Chrysothamnus viscidiflorus</i>										
88	66	100	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	-/-	
<i>Cowania mexicana stansburiana</i>										
88	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	0	0	0	-	20	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	
<i>Ephedra viridis</i>										
88	0	0	0	0	-	0	0	0	-/-	
94	160	0	100	0	-	50	25	25	25/32	
99	300	13	67	20	100	33	7	0	23/30	
04	320	6	63	31	-	0	0	6	28/39	
09	280	21	71	7	-	7	0	7	29/43	
<i>Eriogonum microthecum</i>										
88	932	43	57	0	333	0	0	21	3/3	
94	620	16	84	0	-	0	0	0	3/6	
99	540	7	81	11	120	0	11	11	2/3	
04	820	0	90	10	-	10	61	2	2/4	
09	760	11	66	24	120	0	3	24	1/2	

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<i>Gutierrezia sarothrae</i>									
88	0	0	0	-	-	0	0	0	-/-
94	0	0	0	-	-	0	0	0	8/8
99	120	0	100	-	-	0	0	0	4/4
04	40	0	100	-	20	0	0	0	3/3
09	20	0	100	-	-	0	0	0	4/7
<i>Juniperus osteosperma</i>									
88	0	0	0	-	199	0	0	0	-/-
94	0	0	0	-	-	0	0	0	-/-
99	60	67	33	-	20	0	0	0	-/-
04	80	50	50	-	-	0	0	0	-/-
09	80	25	75	-	-	0	0	0	-/-
<i>Opuntia polyacantha</i>									
88	333	0	100	0	-	0	0	0	3/4
94	100	20	80	0	-	0	0	0	4/9
99	100	0	80	20	-	0	0	20	3/14
04	100	20	80	0	-	0	0	0	3/13
09	60	0	100	0	-	0	0	0	4/9
<i>Pinus edulis</i>									
88	0	0	0	-	-	0	0	0	-/-
94	0	0	0	-	-	0	0	0	-/-
99	80	75	25	-	-	0	0	0	-/-
04	120	33	67	-	-	0	0	0	-/-
09	60	33	67	-	20	0	0	0	51/53
<i>Purshia tridentata</i>									
88	0	0	0	-	-	0	0	0	-/-
94	20	0	100	-	-	0	0	0	8/8
99	0	0	0	-	-	0	0	0	6/11
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-