

Trend Study 16B-22-04

Study site name: Poison Spring Bench.

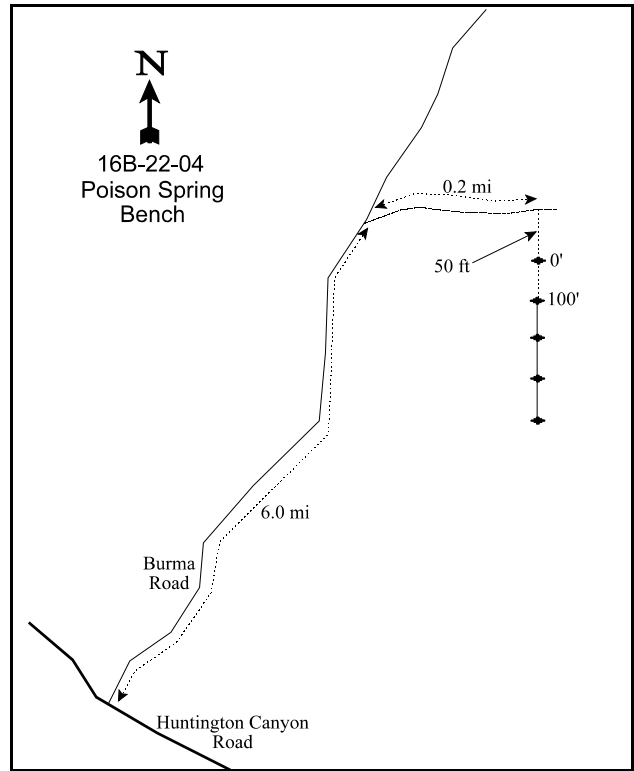
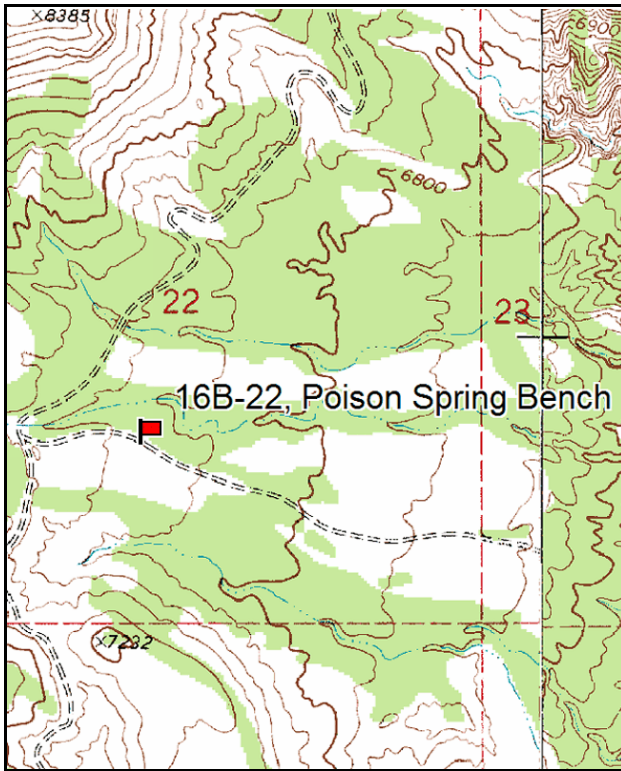
Vegetation type: Chained, Seeded, P-J.

Compass bearing: frequency baseline 165 degrees magnetic.

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

LOCATION DESCRIPTION

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

Diagrammatic Sketch

Township 16S, Range 8E, Section 22

GPS: NAD 27, UTM 12S 4362530 N, 498982 E

DISCUSSION

Poison Spring Bench - Trend Study No. 16B-22

The Poison Spring Bench study is located south of Cedar Creek and southwest of Poison Spring Bench. Elevation at the site is about 6,800 feet. Aspect is to the east, with a gentle slope of 3-5%. 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 with several released pinyon and juniper trees. The area is considered critical deer winter range, but pellet group transects indicate only light to moderate use. It also receives a small amount of elk use. In 1999, a pellet group transect estimated 13 deer days use/acre (32 ddu/ha) and 8 elk days use/acre (20 edu/ha). In 2004, deer use was down to 7 days use/acre (32 ddu/ha), while elk use was higher at 19 days use/acre (46 edu/ha). Livestock use was light with an estimated 15 cow days use/acre (36 cdu/ha) in 1999 and 7 days use/acre (16 cdu/ha) in 2004.

The soil is a gravelly, sandy clay loam with a slightly alkaline pH (7.6). There is a concentration of large rocks, boulders, and pavement on the surface, with a high number of rock in the upper profile. Although there are calcium carbonate (alkali) deposits on the rocks, no hardpan was evident. Soil depth is moderately shallow with an estimated effective rooting depth of just over 12 inches. Phosphorus (4.4 ppm) and potassium (57.6) are both low. Some soil erosion is apparent with pedestalling occurring around the base of black sagebrush and small gullies running through the site. The soil is protected by rock and pavement cover. An erosion condition class rating in 2004 rated this site as stable.

Browse species dominate this site. Shrubs and trees made up 88% of the total vegetation cover in 1994 and 1999. In 2004, browse species contributed to 98% of the total vegetation cover. Perfectly suited to the dry, rocky country, black sagebrush is the most common browse species. Black sagebrush has made up 82, 74, and 73% of the total browse cover in 1994, 1999, and 2004 respectively. Cover was up from 19% in 1999 to 23% in 2004. Population density was estimated at 15,333 plants/acre in 1988, 78% percent of these were young plants. Seedlings numbered 1,400 plants/acre. During the 1994 reading, 9,740 mostly mature plants/acre were estimated using a much larger sample size. Density was estimated at 11,200 plants/acre in 1999 with the vast majority (88%) being mature plants. This remained stable in 2004 with 10,700 plants/acre. Recruitment was low with 80 seedlings/acre and 420 young plants/acre in 1999 and 60 seedlings/acre and 180 young plants/acre in 2004. Percent decadence was 15% in 1994, 9% in 1999, and increased to 15% in 2004. The plants are vigorous and show signs of light hedging.

Other desirable browse species occur on the site in low densities. These include serviceberry, true mountain mahogany, ephedra, and four-wing saltbush. True mountain mahogany, four-wing saltbush, and serviceberry have all been heavily browsed which should be expected with their respective and relative low abundance. Young pinyon and juniper trees that survived the chaining are increasing in size. The point-quarter method estimated pinyon at 103 trees/acre, and juniper at 43 trees/acre in 1999. Average stem diameter for pinyon was 2.1 inches and juniper was 3 inches. In 2004, pinyon was estimated at 111 trees/acre with an average diameter of 2.9 inches. Juniper increased to 56 trees/acre with 5.8 inches stem diameter. Thirty percent of the junipers sampled were trees that survived the chaining. Total pinyon-juniper canopy cover in 2004 was just over 6%. It would be good to implement a thinning program of some kind on this area in the near future, because it would not be very expensive at this time. In another 10 years it could be very costly to implement a practical thinning program which then would involve much larger adult trees.

Herbaceous density and diversity is extremely low. Crested wheatgrass is the most abundant grass on the site. It was stable for the first 3 sampling periods, but plants were small and produced very little aboveground biomass. This is due to the poor site potential of the area that results from shallow, less fertile soils. In 2004, crested wheatgrass decreased significantly, due to drought conditions over the previous 3 years. Cover was

3% in 1999 and was down to only 0.1% in 2004. All grasses combined provide only 3% cover in 1999 and this declined to only 0.1% in 2004. Forbs are even less abundant, with all species combined providing less than 1% cover each time this site was monitored.

1994 TREND ASSESSMENT

Even though shrubs dominate the site, bare ground cover is still quite low at 22%. It has increased since 1988, but only slightly. There is still abundant litter cover from chaining debris but it is declining. Currently the soil trend would be considered stable. Due to the gentle terrain and protective ground cover, erosion is not a serious problem. However, if the chaining litter is not replaced by herbaceous vegetation the soil trend would tend to decline. There is a variety of palatable browse on the site but only black sagebrush is abundant. Population density of this shrub has declined, but this is primarily because of the sampling design was greatly enlarged. The sampling design now gives significantly better estimates for browse populations that have discontinuous and/or clumped distributions. The reproductive potential has declined. Decadency has increased but is still low at 15%. Most of these changes would be due to the increased sample size used in 1994. Trend for browse is stable. Herbaceous vegetation is seriously lacking on this site. Combined nested frequencies of all grasses and forbs sum to only 266. Several forb species encountered in 1988 were not seen in 1994. Trend for herbaceous vegetation is slightly down. The Desirable Components Index (see methods) rating is good at 51. This black sagebrush site was rated using the Wyoming big sagebrush scale because of the elevation. This stand of black sagebrush is abundant and healthy.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - down slightly (2)

winter range condition (DC Index) - 51 (good) black sagebrush (Wyoming big sagebrush scale)

1999 TREND ASSESSMENT

Trend for soil is stable. Ground cover characteristics remain at similar levels to those in 1994. Erosion remains low due to the gentle slope and low precipitation at the site. Trend for browse is stable. The key species, black sagebrush, shows decreased decadency and slightly improved vigor. The population remains stable and use is light to moderate. True mountain mahogany shows improvements in recruitment although density remains relatively low. No plants were classified as decadent in 1999, down from 7% in 1994. Trend for the herbaceous understory is stable, but depleted. The only species that is somewhat abundant is crested wheatgrass, which is low compared to other chained and seeded sites. Sum of nested frequency for perennial grasses and forbs increased in 1999. The DCI score has remained stable and is rated good.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

winter range condition (DC Index) - 52 (good) black sagebrush (Wyoming big sagebrush scale)

2004 TREND ASSESSMENT

Soil trend is stable. Percent bare ground has not changed much since the last reading. Rock, pavement, litter, and the slight slope protect this site from erosion. Browse trend continues to be considered stable. Black sagebrush density has remained stable despite recent drought conditions. Decadence is slightly higher, but cover also is higher. Recruitment is low, but should improve if precipitation patterns return to normal. True mountain mahogany is also stable. The herbaceous understory was depleted in 1999 and is even worse in

2004. Crested wheatgrass was the only abundant species found in previous readings and is significantly lower in 2004. Grasses and forbs make up less than 1% of cover in 2004. Trend is down for understory species. The DCI score dropped to fair to good mostly due to the loss in perennial grass cover.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - down (1)

winter range condition (DC Index) - 42 (fair to good) black sagebrush (Wyoming big sagebrush scale)

HERBACEOUS TRENDS --

Management unit 16B, Study no: 22

T y p e	Species	Nested Frequency				Average Cover %		
		'88	'94	'99	'04	'94	'99	'04
G	Agropyron cristatum	_b 172	_b 143	_b 175	_a 30	2.30	2.82	.14
G	Elymus junceus	-	-	3	-	-	.15	-
G	Oryzopsis hymenoides	-	1	-	-	.00	-	-
G	Sitanion hystrix	6	11	2	3	.02	.03	.00
G	Stipa comata	-	3	-	-	.00	-	-
Total for Annual Grasses		0	0	0	0	0	0	0
Total for Perennial Grasses		178	158	180	33	2.34	3.00	0.14
Total for Grasses		178	158	180	33	2.34	3.00	0.14
F	Arabis spp.	_{ab} 4	_b 12	_{ab} 9	_a -	.05	.01	-
F	Castilleja linariaefolia	-	-	2	-	-	.03	-
F	Cirsium spp.	5	-	-	-	-	-	-
F	Cryptantha confertiflora	_{ab} 44	_b 51	_{ab} 46	_a 18	.56	.28	.22
F	Cruciferae	8	-	-	-	-	-	-
F	Descurainia pinnata (a)	-	1	6	5	.00	.01	.01
F	Eriogonum cernuum (a)	-	5	-	9	.01	-	.01
F	Gilia spp. (a)	-	-	-	4	-	-	.01
F	Ipomopsis aggregata	_b 9	_a 1	_{ab} 8	_a -	.00	.04	-
F	Lappula occidentalis (a)	-	-	-	4	-	-	.01
F	Lepidium montanum	2	6	-	-	.04	-	-
F	Lepidium montanum	-	-	-	7	-	-	.01
F	Machaeranthera spp	-	-	-	3	-	-	.03
F	Medicago sativa	3	-	3	-	-	.00	-
F	Penstemon caespitosus	_b 18	_b 19	_b 29	_a -	.11	.09	-
F	Penstemon carnosus	_c 22	_a -	_b 9	_{bc} 14	-	.04	.06
F	Salsola iberica (a)	-	_b 13	_a -	_a 2	.07	-	.00
F	Schoenocrambe linifolia	-	-	2	1	-	.00	.00
F	Senecio multilobatus	4	-	5	-	-	.01	-

Type	Species	Nested Frequency				Average Cover %		
		'88	'94	'99	'04	'94	'99	'04
	Total for Annual Forbs	0	19	6	24	0.09	0.01	0.05
	Total for Perennial Forbs	119	89	113	43	0.77	0.54	0.33
	Total for Forbs	119	108	119	67	0.87	0.56	0.38

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	'94	'99	'04
B	Artemisia nova	97	98	97	19.75	19.35	22.97
B	Cercocarpus montanus	10	14	14	1.14	3.25	2.56
B	Ephedra viridis	4	7	8	.18	.00	.38
B	Eriogonum microthecum	13	12	16	.06	.04	.09
B	Gutierrezia sarothrae	0	4	2	-	-	.00
B	Juniperus osteosperma	0	3	3	1.78	2.67	3.05
B	Opuntia polyacantha	5	5	5	.00	.03	.03
B	Pinus edulis	0	4	6	1.03	.85	1.69
B	Pseudotsuga menziesii	-	-	-	-	-	.63
B	Purshia tridentata	1	0	0	.03	-	-
	Total for Browse	130	147	151	24.00	26.20	31.42

CANOPY COVER, LINE INTERCEPT --

Management unit 16B, Study no: 22

Species	Percent Cover	
	'99	'04
Artemisia nova	-	23.75
Cercocarpus montanus	-	2.83
Ephedra viridis	-	1.21
Eriogonum microthecum	-	.01
Juniperus osteosperma	1.39	2.73
Pinus edulis	-	3.34

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 16B, Study no: 22

Species	Average leader growth (in)
	'04
Artemisia nova	0.73
Cercocarpus montanus	3.1

POINT-QUARTER TREE DATA --
Management unit 16B, Study no: 22

Species	Trees per Acre	
	'99	'04
Juniperus osteosperma	43	56
Pinus edulis	103	111

Average diameter (in)	
'99	'04
3.0	5.8
2.1	2.9

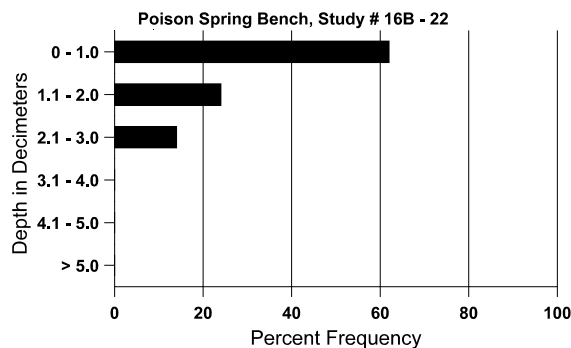
BASIC COVER --
Management unit 16B, Study no: 22

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

SOIL ANALYSIS DATA --
Management unit 16B, Study no: 22, Study Name: Poison Spring Bench

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
12.3	60.7 (13.5)	7.6	50.7	27.4	21.8	3.9	4.4	57.6	0.8

Stoniness Index



PELLET GROUP DATA --
 Management unit 16B, Study no: 22

Type	Quadrat Frequency		
	'94	'99	'04
Rabbit	26	18	10
Elk	7	6	7
Deer	24	24	7
Cattle	7	5	2

Days use per acre (ha)	
'99	'04
-	-
8 (20)	19 (46)
13 (32)	5 (12)
15 (36)	7 (16)

BROWSE CHARACTERISTICS --
 Management unit 16B, Study no: 22

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Amelanchier utahensis												
88	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	17/21
99	0	-	-	-	-	-	0	0	-	-	0	-/-
04	0	-	-	-	-	-	0	0	-	-	0	-/-
Artemisia nova												
88	15333	1400	12000	2533	800	-	9	0	5	-	.86	9/19
94	9740	-	880	7380	1480	200	9	.41	15	5	5	10/27
99	11200	80	420	9820	960	300	26	0	9	2	3	9/20
04	10700	60	180	8880	1640	960	10	10	15	7	7	10/22
Atriplex canescens												
88	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	40/37
99	0	-	-	-	-	-	0	0	-	-	0	52/41
04	0	-	-	-	-	-	0	0	-	-	0	36/48
Atriplex confertifolia												
88	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	20/25
99	0	-	-	-	-	-	0	0	-	-	0	-/-
04	0	-	-	-	-	-	0	0	-	-	0	-/-
Cercocarpus montanus												
88	0	-	-	-	-	-	0	0	0	-	0	-/-
94	300	-	-	280	20	20	20	7	7	-	0	33/38
99	400	60	40	360	-	20	5	70	0	-	0	36/47
04	320	20	20	260	40	20	31	63	13	13	13	35/43

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Chrysothamnus viscidiflorus</i>												
88	66	-	66	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	0	-	-	-	-	-	0	0	-	-	0	-/-
04	0	-	-	-	-	-	0	0	-	-	0	-/-
<i>Cowania mexicana stansburiana</i>												
88	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	0	20	-	-	-	-	0	0	-	-	0	-/-
04	0	-	-	-	-	-	0	0	-	-	0	-/-
<i>Ephedra viridis</i>												
88	0	-	-	-	-	-	0	0	0	-	0	-/-
94	160	-	-	160	-	-	50	25	0	-	25	25/32
99	300	100	40	200	60	40	33	7	20	-	0	23/30
04	320	-	20	200	100	-	0	0	31	6	6	28/39
<i>Eriogonum microthecum</i>												
88	933	333	400	533	-	-	0	0	0	-	21	3/3
94	620	-	100	520	-	20	0	0	0	-	0	3/6
99	540	120	40	440	60	20	0	11	11	11	11	2/3
04	820	-	-	740	80	60	10	61	10	2	2	2/4
<i>Gutierrezia sarothrae</i>												
88	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	8/8
99	120	-	-	120	-	-	0	0	-	-	0	4/4
04	40	20	-	40	-	-	0	0	-	-	0	3/3
<i>Juniperus osteosperma</i>												
88	0	200	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	60	20	40	20	-	-	0	0	-	-	0	-/-
04	80	-	40	40	-	-	0	0	-	-	0	-/-
<i>Opuntia polyacantha</i>												
88	333	-	-	333	-	-	0	0	0	-	0	3/4
94	100	-	20	80	-	-	0	0	0	-	0	4/9
99	100	-	-	80	20	-	0	0	20	20	20	3/14
04	100	-	20	80	-	20	0	0	0	-	0	3/13

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Pinus edulis</i>												
88	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	80	-	60	20	-	-	0	0	-	-	0	-/-
04	120	-	40	80	-	-	0	0	-	-	0	-/-
<i>Purshia tridentata</i>												
88	0	-	-	-	-	-	0	0	-	-	0	-/-
94	20	-	-	20	-	-	0	0	-	-	0	8/8
99	0	-	-	-	-	-	0	0	-	-	0	6/11
04	0	-	-	-	-	-	0	0	-	-	0	-/-