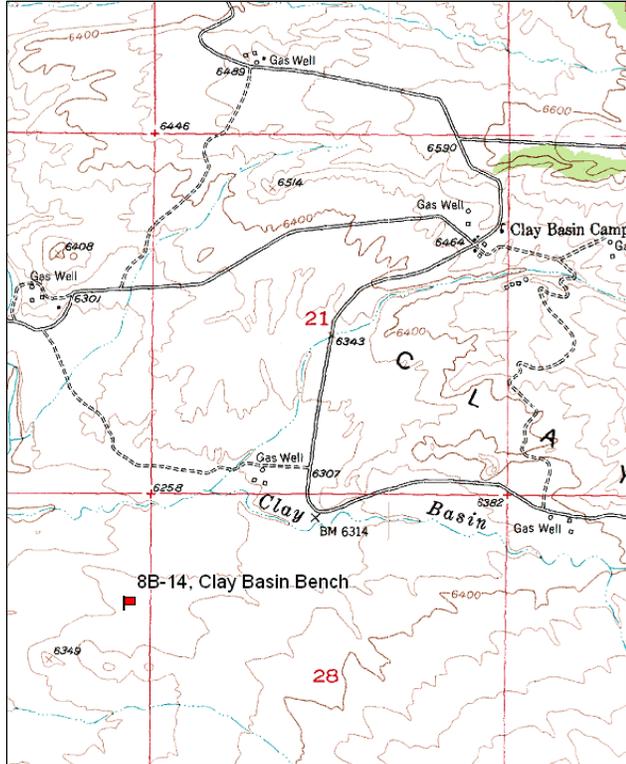


CLAY BASIN BENCH - TREND STUDY NO. 8B-14-10

Vegetation Type: Wyoming Big Sagebrush
Range Type: Crucial Deer Winter, Crucial Elk Winter
NRCS Ecological Site Description: SANDY (10-14W), R034XY250WY
Land Ownership: BLM
Elevation: 6295 ft. (1919 m)
Aspect: West
Slope: 3%
Transect bearing: 107° magnetic
Belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

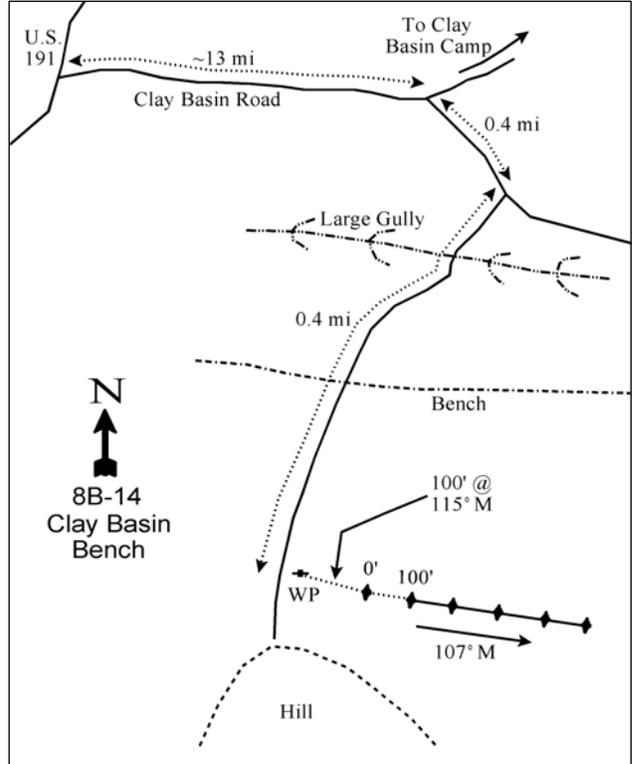
Directions:
 From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191. Continue over the stateline into Wyoming and turn right just after Minnies Gap onto the Clay Basin road. Drive approximately 13 miles toward Clay Basin to the turn off to Clay Basin Camp. Turn right again and proceed 0.4 miles to another intersection. Turn right and go 0.4 miles going through the large gully and onto the bench. The witness post is on the left side of the road. From witness post go 100 feet (17 paces) at 115°M.

Map Name: Clay Basin



Township: 3N Range: 24E Section: 29

Diagrammatic Sketch:



GPS: NAD 83, UTM 12T 649495 E 4537023 N

CLAY BASIN BENCH - TREND STUDY NO. 8B-14

Site Information

Site Description: The study is located on a bench about one mile to the south of Clay Basin Camp. There is a large amount of energy development in the surrounding area with many roads and pipelines. An underground pipeline was laid next to the road that is adjacent to the transect between 2005 and 2010. The trenching affected the first belt of the transect. Grazing in the area is managed by the Bureau of Land Management (BLM) as part of the Clay Basin allotment. Deer and elk have used the area primarily as winter range with antelope also using the area. Due to difficulties in differentiating between species, deer and antelope pellets were all classified as deer. Pellet group transect data estimated heavy deer/antelope use in 2000 and 2010, with more moderate use in 2005. Estimated elk and cattle use has been light since 2000 (Table - Pellet Group Data).

Browse: At the outset of the study in 2000, the site supported an old, dense stand of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), but there was a large die-off of sagebrush between 2000 and 2005, reducing the population to a low density. The surviving population consists of mostly decadent plants that receive moderate to heavy use. Recruitment of young sagebrush plants was poor in 2000 and 2005, but was good in 2010. Additional browse forage is provided by small numbers of winterfat (*Ceratoides lanata*), stickleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*) and slenderbush eriogonum (*Eriogonum microthecum*). All of these species have received moderate to heavy use over the course of the study (Table - Browse Characteristics).

Herbaceous Understory: Grasses were not abundant at the outset of the study in 2000, but increased substantially in 2005, with a large increase in the nested frequency and cover of Sandberg bluegrass (*Poa secunda*) and needle-and-thread (*Stipa comata*). Other common perennial grass species include western wheatgrass (*Agropyron smithii*) and Indian ricegrass (*Oryzopsis hymenoides*). Cheatgrass (*Bromus tectorum*) increased substantially in 2010, but much of the increase was in the disturbed soil from the pipeline trenching that affected the first belt of the transect. Forbs are not diverse or abundant on the site with the low growing species Hoods phlox (*Phlox hoodii*) providing almost all of the perennial forb cover (Table - Herbaceous Trends).

Soil: The soil has a sandy loam texture with a neutral soil reaction (pH 7.3) (Table - Soil Analysis Data). Bare ground cover was moderately high in 2000 and 2005, but decreased in 2010 with increases in the herbaceous vegetation cover. Cryptogam cover was very high in 2000, but decreased substantially in 2005 (Table - Basic Cover). There are some small gullies on the site which appear to have originally been cattle trails. The soil erosion condition was classified stable in 2005 and 2010.

Trend Assessments

Browse:

- **2000 to 2005 - down (-2):** The density of Wyoming big sagebrush decreased by 71% from 6,500 plants/acre to 1,860 plants/acre, and cover decreased from 16% to 3%. Decadence of sagebrush increased from 32% to 89% and poor vigor increased from 14% to 82%.
- **2005 to 2010 - slightly down (-1):** The Wyoming big sagebrush density decreased by 13% to 1,620 plants/acre, but cover remained similar. Decadence decreased to 48% and poor vigor decreased to 41%, but both are still considered high. Recruitment of young plants increased from 2% to 25% of the population.

Grass:

- **2000 to 2005 - up (+2):** The sum of nested frequency of perennial grasses increased by 49% and cover increased from 5% to 20%. There was a significant increase in the nested frequency of Sandberg bluegrass and needle-and-thread.

- **2005 to 2010 - stable (0):** There was little change in the sum of nested frequency of perennial grasses, but cover increased to 29%.

Forb:

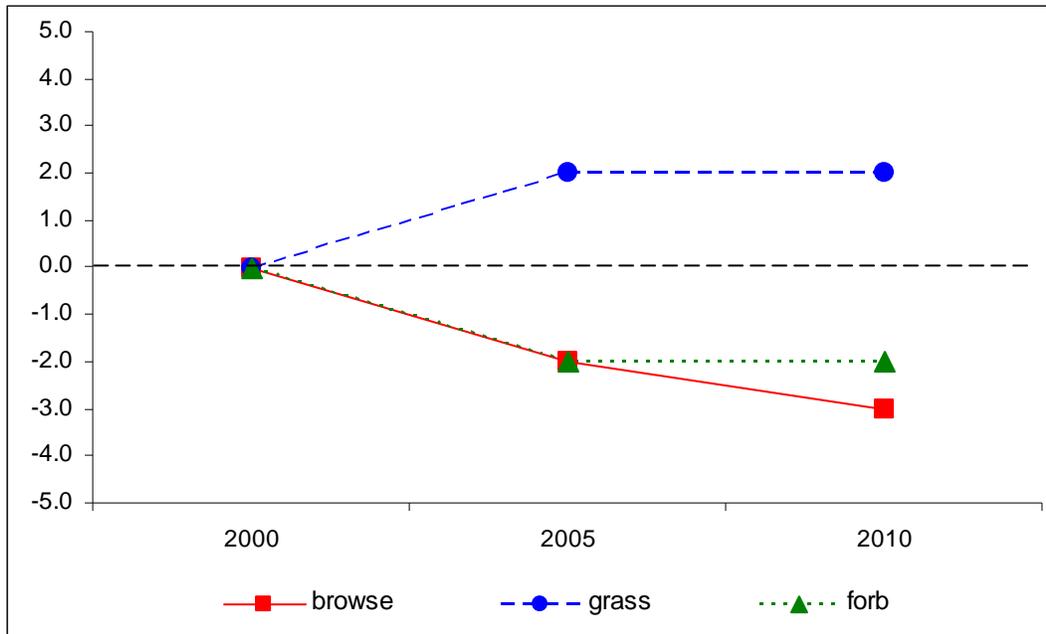
- **2000 to 2005 - down (-2):** The perennial forb sum of nested frequency decreased by 89% and cover decreased from 2% to less than 1%. Perennial forbs became rare on the site.
- **2005 to 2010 - stable (0):** Perennial forbs remained rare on the site.

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --
Management unit 8B, study no: 14

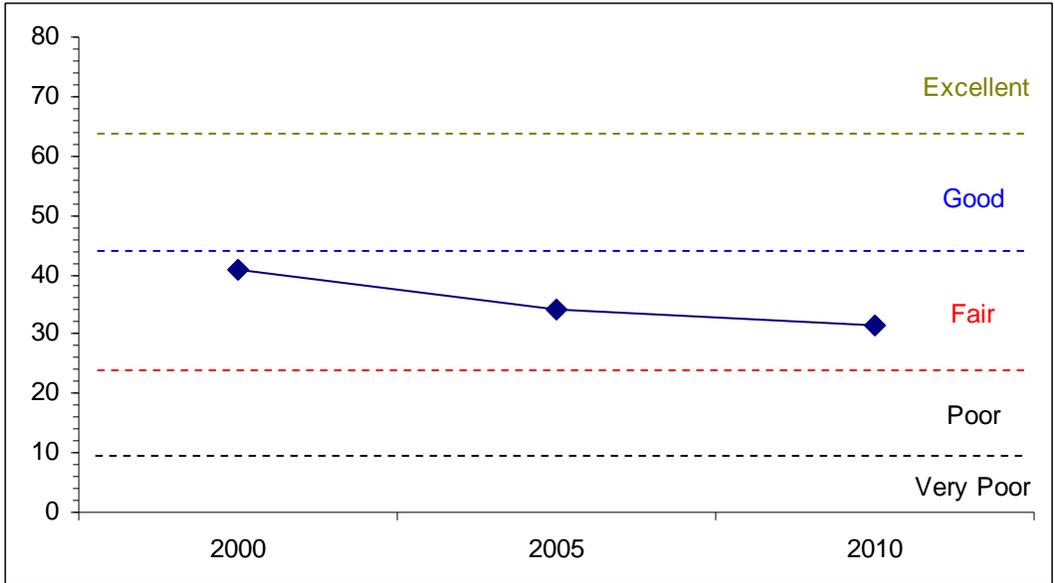
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
00	19.9	5.5	1.0	10.7	-0.1	3.9	0.0	40.8	Fair
05	3.7	0.0	0.0	30.0	0.0	0.4	0.0	34.1	Fair
10	3.1	0.0	0.0	30.0	-2.0	0.5	0.0	31.5	Fair

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 8B, Study no: 14



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--
 Management unit 8B, Study no: 14



HERBACEOUS TRENDS--
 Management unit 08B, Study no: 14

Type	Species	Nested Frequency			Average Cover %		
		'00	'05	'10	'00	'05	'10
G	<i>Agropyron smithii</i>	b ₁₃₄	ab ₁₂₀	a ₉₇	1.30	1.66	2.88
G	<i>Agropyron spicatum</i>	a ₋	a ₅	b ₃₀	-	.03	.96
G	<i>Bromus tectorum</i> (a)	a ₁₈	a ₂	b ₁₂₈	.10	.00	2.70
G	<i>Oryzopsis hymenoides</i>	b ₇₁	ab ₄₂	a ₂₅	1.12	.79	1.11
G	<i>Poa bulbosa</i>	-	-	6	-	-	.18
G	<i>Poa fendleriana</i>	a ₄	b ₃₈	a ₂₅	.00	.76	.91
G	<i>Poa secunda</i>	a ₈₀	b ₂₆₉	b ₃₀₇	.36	10.15	13.51
G	<i>Sitanion hystrix</i>	ab ₁₄	b ₂₂	a ₁₄	.10	.38	.33
G	<i>Stipa comata</i>	a ₁₃₂	b ₁₅₄	b ₁₈₇	2.43	5.77	9.19
Total for Annual Grasses		18	2	128	0.10	0.00	2.70
Total for Perennial Grasses		435	650	691	5.33	19.56	29.10
Total for Grasses		453	652	819	5.44	19.56	31.80
F	<i>Alyssum alyssoides</i> (a)	-	-	2	-	-	.00
F	<i>Collinsia parviflora</i> (a)	-	3	4	-	.01	.03
F	<i>Descurainia pinnata</i> (a)	a ₋	b ₁₄	a ₃	-	.38	.00
F	<i>Erigeron pumilus</i>	2	-	-	.01	-	-
F	<i>Hymenoxys richardsonii</i>	4	-	-	.00	-	-
F	<i>Lappula occidentalis</i> (a)	a ₋	b ₃₆	a ₁₂	-	.31	.02
F	<i>Lepidium</i> sp. (a)	a ₋	ab ₈	b ₁₄	-	.02	.06
F	<i>Machaeranthera canescens</i>	-	3	1	-	.01	.00
F	<i>Penstemon</i> sp.	1	-	-	.00	-	-
F	<i>Phlox hoodii</i>	b ₁₃₄	a ₁₂	a ₂₃	1.92	.13	.20
F	<i>Ranunculus testiculatus</i> (a)	-	11	-	-	.04	-
F	<i>Salsola iberica</i> (a)	a ₋	a ₋	b ₃₃	-	-	1.57

T y P e	Species	Nested Frequency			Average Cover %		
		'00	'05	'10	'00	'05	'10
F	Schoenocrambe linifolia	2	1	9	.00	.03	.02
F	Townsendia incana	4	-	-	.01	-	-
F	Tragopogon dubius	-	-	1	-	-	.03
Total for Annual Forbs		0	72	68	0	0.76	1.69
Total for Perennial Forbs		147	16	34	1.95	0.18	0.25
Total for Forbs		147	88	102	1.95	0.94	1.95

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

BROWSE TRENDS--

Management unit 08B, Study no: 14

T y P e	Species	Strip Frequency			Average Cover %		
		'00	'05	'10	'00	'05	'10
B	Artemisia frigida	0	0	1	-	-	-
B	Artemisia tridentata wyomingensis	97	54	48	15.67	2.75	2.24
B	Ceratoides lanata	10	10	6	.21	.24	.21
B	Chrysothamnus viscidiflorus viscidiflorus	5	6	6	.03	-	.06
B	Eriogonum microthecum	6	0	1	.00	-	-
B	Gutierrezia sarothrae	82	0	39	3.92	-	1.23
B	Opuntia sp.	43	47	39	1.75	2.71	3.10
Total for Browse		243	117	140	21.60	5.71	6.85

CANOPY COVER, LINE INTERCEPT--

Management unit 08B, Study no: 14

Species	Percent Cover	
	'05	'10
Artemisia frigida	-	.01
Artemisia tridentata wyomingensis	1.75	2.00
Ceratoides lanata	-	.11
Chrysothamnus viscidiflorus viscidiflorus	.05	.16
Gutierrezia sarothrae	-	1.45
Opuntia sp.	1.75	1.25

BASIC COVER--

Management unit 08B, Study no: 14

Cover Type	Average Cover %		
	'00	'05	'10
Vegetation	28.52	24.39	44.29
Rock	.20	.16	0
Pavement	.60	.12	.15
Litter	29.68	29.11	43.61
Cryptogams	22.77	9.35	5.79
Bare Ground	43.54	46.50	29.29

SOIL ANALYSIS DATA --

Management unit 8B, Study no: 14, Study Name: Clay Basin Bench

Effective rooting depth (in)	pH	sandy loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
12.9	7.3	65.6	17.1	17.3	1.2	6.3	89.6	0.5

PELLET GROUP DATA--

Management unit 08B, Study no: 14

Type	Quadrat Frequency			Days use per acre (ha)		
	'00	'05	'10	'00	'05	'10
Rabbit	9	83	6	-	-	-
Elk	3	2	1	5 (13)	3 (8)	-
Deer	47	18	8	56 (139)	25 (63)	62 (154)
Cattle	4	7	3	17 (43)	12 (30)	15 (38)

BROWSE CHARACTERISTICS--

Management unit 08B, Study no: 14

		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									
00	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	-/-
10	20	0	100	-	-	0	0	0	9/9
Artemisia tridentata wyomingensis									
00	6500	2	66	32	-	51	8	14	13/25
05	1860	2	9	89	-	34	65	82	12/13
10	1620	25	27	48	260	51	5	41	11/16
Ceratoides lanata									
00	320	0	81	19	-	63	25	13	3/6
05	380	11	84	5	-	5	95	0	6/7
10	200	10	90	0	-	0	0	0	9/7
Chrysothamnus viscidiflorus viscidiflorus									
00	100	0	100	-	-	40	0	0	8/7
05	120	17	83	-	-	33	0	0	14/16
10	120	0	100	-	-	0	0	0	12/24

		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>Eriogonum microthecum</i>										
00	140	0	100	-	-	14	57	0	4/5	
05	0	0	0	-	-	0	0	0	-/-	
10	20	0	100	-	-	0	0	0	3/5	
<i>Gutierrezia sarothrae</i>										
00	12660	4	93	3	80	0	0	.78	4/7	
05	0	0	0	0	-	0	0	0	-/-	
10	1300	15	85	0	-	0	0	0	8/11	
<i>Opuntia sp.</i>										
00	1240	3	84	13	-	0	0	0	3/14	
05	2160	0	72	28	-	0	0	3	4/16	
10	1620	0	88	12	20	5	0	10	4/14	
<i>Sarcobatus vermiculatus</i>										
00	0	0	0	-	-	0	0	0	-/-	
05	0	0	0	-	-	0	0	0	-/-	
10	0	0	0	-	-	0	0	0	21/31	