

Trend Study 16R-3-04

Study site name: Price Pipeline Native North .

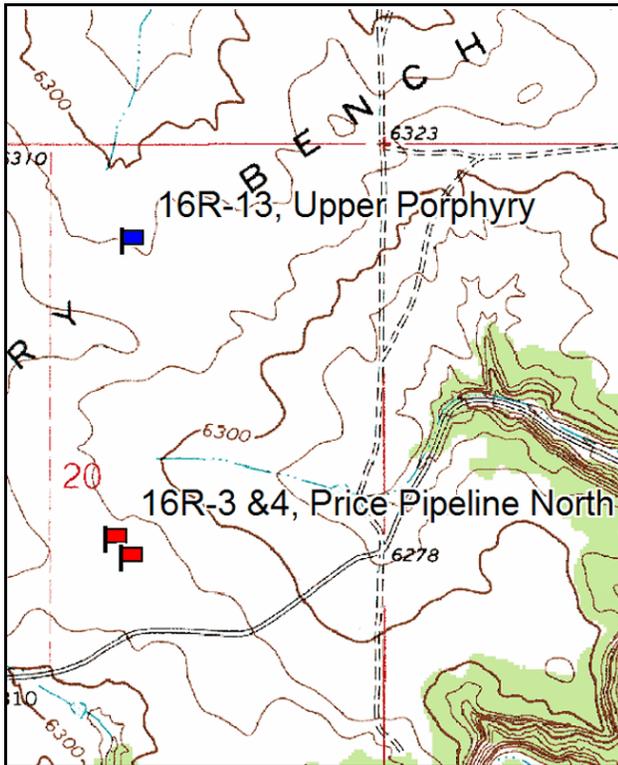
Vegetation type: Wyoming Big Sagebrush .

Compass bearing: frequency baseline 6 degrees magnetic.

Frequency belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

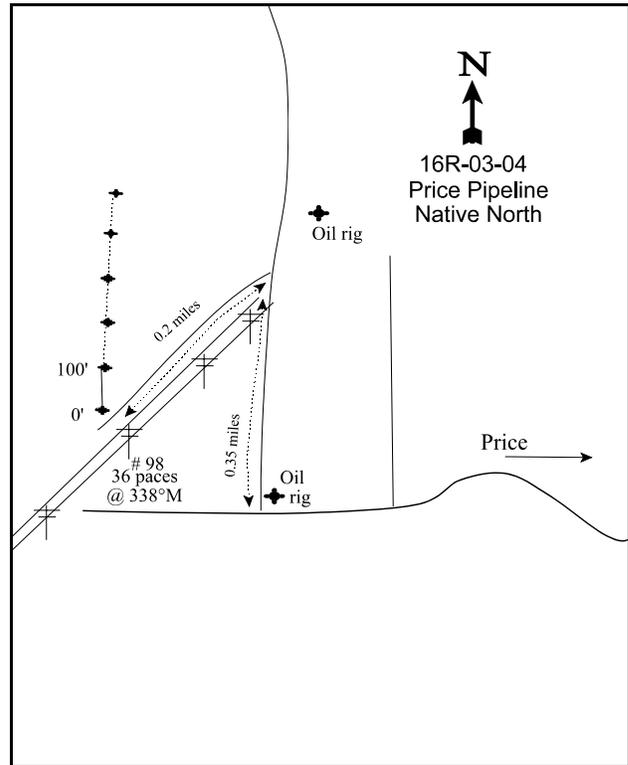
LOCATION DESCRIPTION

Take Westwood Blvd (1550 W) northwest out of Price 2.35 miles to a major intersection. Turn left onto Gordon Creek Road and travel 0.45 miles to a fork. Bear left away from Gordon Creek, going 0.1 miles to a gravel pit. Continue 5.6 miles on the Pinnacle Peak Road to a 3-way fork at the top of the bench with an oil rig near the intersection. Drive 0.35 miles north to a small road that goes under the powerlines. Turn left (southwest) and travel 0.2 miles to power pole number 98. From this power pole walk 36 paces at 338 degrees magnetic to the 0-foot stake. The study is marked by green, steel fenceposts approximately 12-18 inches in height.



Map name: Pinnacle Peak

Township 14S, Range 9E, Section 20



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4382223 N, 505506 E

## DISCUSSION

### Price Pipeline North Native - Trend Study No. 16R-3

This trend study is found on Porphyry Bench west of Price. This study was established in 1997 to compare the undisturbed community to the area that was rehabilitated (16R-4) for a natural gas pipeline. These paired studies are found about 1.5 miles west of the regular trend study Porphyry Bench 16B-18, which was established in 1988. The vegetation type on this bench is Wyoming big sagebrush. Elevation is 6,330 feet, with a slope of 6% and aspect to the north. This area is critical winter range for deer. Pellet group transect data in 2004 estimate 90 deer days use/acre (222 ddu/ha). Cattle use was 14 cow days use/ac (34 cdu/ha).

Soil texture is classified as sandy loam. Rocks are very rare throughout the profile. This soil is susceptible to erosion because there is very little protective cover. Relative percent bare ground cover was 51% in 1997 and increased to 57% in 2004. Cryptogam cover decreased from 11 to 2%. An erosion class index in 2004 rated erosion on this site as stable, but due to high bare ground this site could be susceptible to erosion.

Wyoming big sagebrush is the key species here. Drought conditions from 2001-2003 have had harmful effects on this population. This has been documented with many trend studies in the area including the nearby Porphyry Bench. Annual precipitation has only been 48-60% of average during this time and spring conditions (April-June) have been very dry and were only 13% of normal in 2002. Sagebrush density on this site dropped from 3,720 plants/acre to 2,020 plants/acre in 2004. Decadency was 48% in 1997 and increased to 97% of the population in 2004. Sixty eight percent of the population were classified as dying. Only a few branches had live foliage on them. No young were found in 2004, but 4,320 seedlings/acre were sampled. Use was considered heavy in 2004 with 82% showing heavy use. Use was mostly moderate in 1997. Cover decreased from 9% to 4%. Sagebrush die-off at this site was not quite as severe as it was at other sites in the area. Broom snakeweed density declined from 2,100 plants/acre to only 40 plants/acre in 2004.

The seeded grass crested wheatgrass indicates that this site was seeded in the past. In 1997 it was the most dominant grass species. It was found in 82% of the quadrats and had 6% cover. This dropped significantly to 14% quadrat frequency and only 1% cover in 2004. Bottlebrush squirreltail also decreased significantly, while western wheatgrass increased significantly from less than 1% cover to 9% cover in 2004. Reduction in competition with sagebrush and crested wheatgrass may have allowed this species to increase. Abundance of perennial grasses was almost two times lower in 2004. Forbs were diverse, but mostly annual species. Ten annual species were encountered in 2004. Scarlet globemallow was the only perennial species found in any abundance. It increased significantly from 1997.

### 2004 TREND ASSESSEMENT

Soil trend is slightly down. Bare ground has increased and cryptogam cover has decreased. No signs of erosion were found in 2004. Browse trend is down. Drought and heavy use has had harmful effects on sagebrush. Wyoming big sagebrush density decreased and 97% of the population was considered decadent. Seedlings were very abundant, which is encouraging for the future. Herbaceous understory trend is down slightly. Crested wheatgrass declined, but is being replaced by western wheatgrass. Scarlet globemallow increased, but many annual forbs are found on this site. The Desirable Components Index (see methods) rating was fair in 1997, but dropped to poor in 2004 with the sagebrush die off and high decadence.

#### TREND ASSESSMENT

soil - down slightly (2)

browse - down (1)

herbaceous understory - down slightly (2)

1997 winter range condition (DC Index) - 29 (fair) Wyoming big sagebrush type

2004 winter range condition (DC Index) - 17 (poor) Wyoming big sagebrush type

HERBACEOUS TRENDS --  
Management unit 16R, Study no: 3

Type	Species	Nested Frequency		Average Cover %	
		'97	'04	'97	'04
G	<i>Agropyron cristatum</i>	<sub>b</sub> 285	<sub>a</sub> 36	5.97	.96
G	<i>Agropyron smithii</i>	<sub>a</sub> 106	<sub>b</sub> 208	.37	9.39
G	<i>Bromus tectorum</i> (a)	13	8	.04	.01
G	<i>Oryzopsis hymenoides</i>	<sub>a</sub> 14	<sub>b</sub> 35	.12	.12
G	<i>Sitanion hystrix</i>	<sub>b</sub> 54	<sub>a</sub> 5	.51	.06
G	<i>Sporobolus cryptandrus</i>	-	5	-	.03
G	<i>Stipa comata</i>	5	1	.01	.03
G	<i>Vulpia octoflora</i> (a)	<sub>a</sub> -	<sub>b</sub> 16	-	.03
Total for Annual Grasses		13	24	0.03	0.04
Total for Perennial Grasses		464	290	6.98	10.60
Total for Grasses		477	314	7.02	10.64
F	<i>Astragalus convallarius</i>	3	2	.03	.16
F	<i>Chenopodium fremontii</i> (a)	-	5	-	.04
F	<i>Chenopodium leptophyllum</i> (a)	<sub>a</sub> -	<sub>b</sub> 42	-	.20
F	<i>Descurainia pinnata</i> (a)	<sub>a</sub> -	<sub>b</sub> 22	-	.40
F	<i>Draba</i> spp. (a)	-	1	-	.00
F	<i>Eriogonum cernuum</i> (a)	-	3	-	.00
F	<i>Erodium cicutarium</i> (a)	-	3	-	.00
F	<i>Gayophytum ramosissimum</i> (a)	-	2	-	.00
F	<i>Gilia</i> spp. (a)	-	3	-	.01
F	<i>Halogeton glomeratus</i> (a)	-	2	-	.01
F	<i>Lappula occidentalis</i> (a)	<sub>a</sub> 3	<sub>b</sub> 11	.00	.03
F	<i>Machaeranthera</i> spp	-	1	-	.00
F	<i>Sphaeralcea coccinea</i>	<sub>a</sub> 23	<sub>b</sub> 39	.10	1.47
Total for Annual Forbs		3	94	0.00	0.70
Total for Perennial Forbs		26	42	0.13	1.64
Total for Forbs		29	136	0.13	2.35

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

BROWSE TRENDS --

Management unit 16R, Study no: 3

Type	Species	Strip Frequency		Average Cover %	
		'97	'04	'97	'04
B	Amelanchier utahensis	-	-	-	.15
B	Artemisia tridentata wyomingensis	86	55	9.04	3.85
B	Chrysothamnus viscidiflorus viscidiflorus	4	12	.03	.21
B	Gutierrezia sarothrae	48	2	.76	.00
B	Opuntia spp.	1	4	-	.03
Total for Browse		139	73	9.84	4.26

CANOPY COVER, LINE INTERCEPT --

Management unit 16R, Study no: 3

Species	Percent Cover
	'04
Artemisia tridentata wyomingensis	1.71
Chrysothamnus viscidiflorus viscidiflorus	.48

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 16R, Study no: 3

Species	Average leader growth (in)
	'04
Artemisia tridentata wyomingensis	2.9

BASIC COVER --

Management unit 16R, Study no: 3

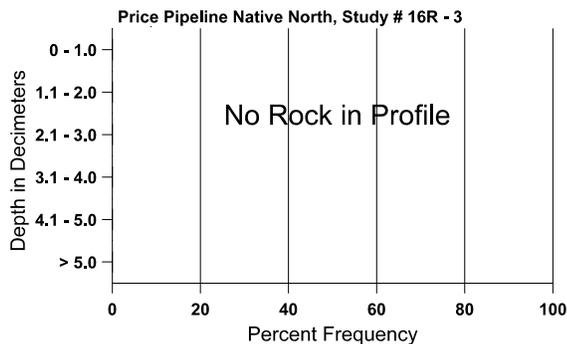
Cover Type	Average Cover %	
	'97	'04
Vegetation	16.18	18.00
Rock	.14	.22
Pavement	.18	.03
Litter	21.45	26.72
Cryptogams	10.79	2.07
Bare Ground	49.81	61.62

SOIL ANALYSIS DATA --

Management unit 16R, Study no: 3, Study Name: Price Pipeline Native North

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
13.6	59.0 (17.7)	7.9	47.6	29.8	22.6	1.2	13.7	86.4	0.5

### Stoniness Index



PELLET GROUP DATA --

Management unit 16R, Study no: 3

Type	Quadrat Frequency		Days use per acre (ha)
	'97	'04	
Rabbit	17	30	-
Horse	1	-	-
Elk	1	1	-
Deer	24	70	90 (222)
Cattle	3	7	14 (34)

BROWSE CHARACTERISTICS --

Management unit 16R, Study no: 3

		Age class distribution (plants per acre)					Utilization					
Y	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Artemisia tridentata wyomingensis</i>												
97	<b>3720</b>	20	80	1840	1800	1640	64	12	48	34	35	17/29
04	<b>2020</b>	4320	-	60	1960	3440	12	82	97	68	68	24/32
<i>Chrysothamnus viscidiflorus viscidiflorus</i>												
97	<b>80</b>	-	20	60	-	-	0	25	-	-	0	5/6
04	<b>360</b>	1120	60	300	-	20	0	0	-	-	0	7/11
<i>Gutierrezia sarothrae</i>												
97	<b>2100</b>	1160	200	1900	-	-	0	0	-	-	0	10/11
04	<b>40</b>	20	-	40	-	-	0	0	-	-	0	6/7

		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)	
Leptodactylon pungens													
97	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-	
04	<b>0</b>	-	-	-	-	-	0	0	-	-	0	4/5	
Opuntia spp.													
97	<b>20</b>	-	-	20	-	-	0	0	0	-	0	5/13	
04	<b>120</b>	-	60	40	20	-	0	0	17	17	17	4/8	