

Trend Study 4-13-06

Study site name: Wheatgrass Hollow .

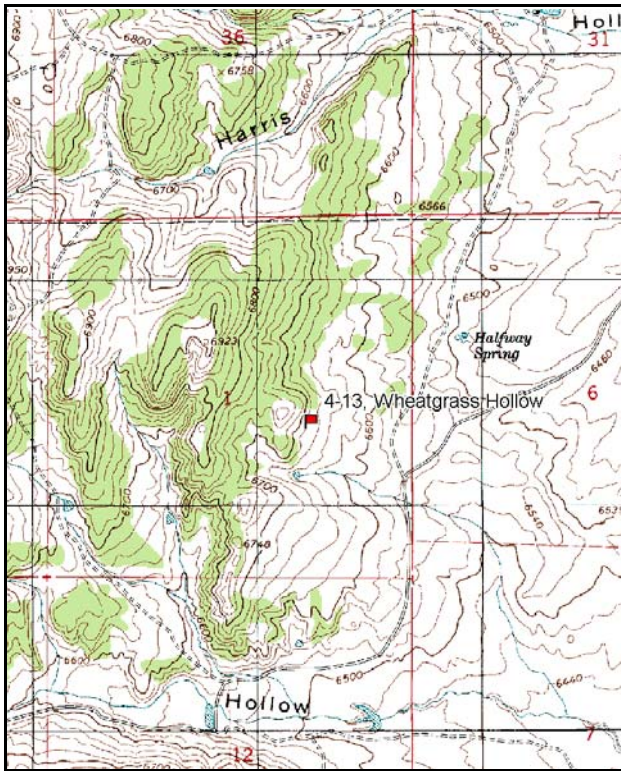
Vegetation type: Big Sagebrush .

Compass bearing: frequency baseline 135 degrees magnetic.

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

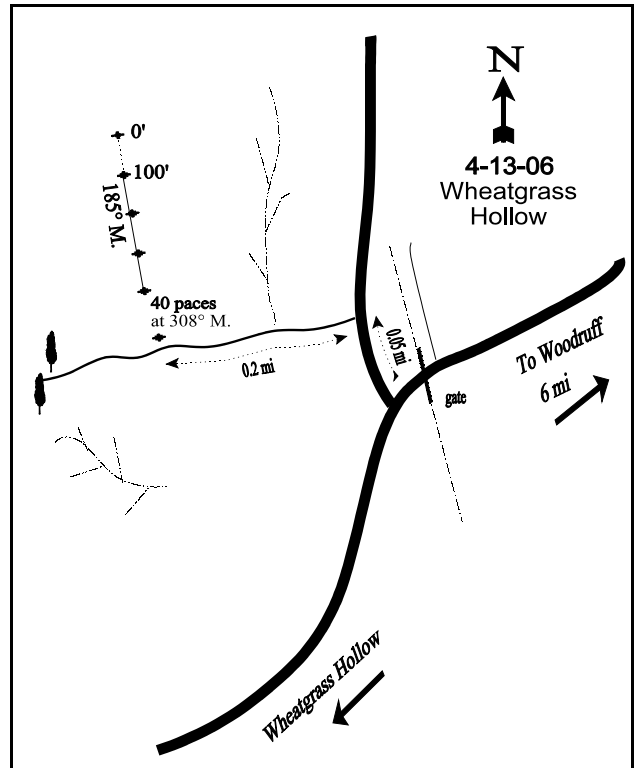
LOCATION DESCRIPTION

Where Highway U-16 bends to the east on the south side of Woodruff, continue straight on Deseret Road (South Main). Go 2.5 miles and turn right (west) onto the Wheatgrass Road. Go 3.25 miles, crossing several cattleguards, to the fourth cattleguard. Continue past this cattleguard to a fork. Go north 0.05 miles to a fork with a faint road on the left. Go 0.2 miles west on the faint road to a witness post. From the witness post, walk 40 paces at 308 degrees magnetic to the 400-foot baseline stake. The 0-foot baseline stake is located 400 feet to the north at a bearing of 315 degrees magnetic.



Map Name: Neponset Reservoir NW

Township 8N, Range 6E, Section 1



Diagrammatic Sketch

UTM NAD 27, UTM 12T 4589340 N 482214 E

DISCUSSION

Wheatgrass Hollow - Trend Study No. 4-13

Study Information

This study was established in 1990 on BLM-managed winter range which is surrounded by Deseret Land and Livestock properties (elevation: 6,700 feet, slope: 10%, aspect: southeast). The vegetation type is Wyoming big sagebrush with scattered juniper and pinyon and a sparse understory. The woodland is moderately dense on the ridge above the study area. Deer use the area in most winters. Pellet group frequency was 38% for deer in 1996, 20% in 2001, and 17% in 2006. Only a few elk pellet groups or cattle pats have been sampled. The pellet group transect in 2001 estimated 58 deer days use/acre (144 ddu/ha) and only 1 elk pellet group was sampled. In 2006, 28 deer and 2 elk days use/acre were estimated (69 ddu/ha and 5 edu/ha). Most of the deer pellet groups appeared to be from winter use.

Soil

The soil is in the Lariat series, which consists of moderately deep, well drained, moderately rapid permeability soils that formed in residuum from sandstone on rolling uplands and foothills (USDA-NRCS 2006). The effective rooting depth was estimated at just over 10 inches. Soil texture is a sandy clay loam with a neutral soil reaction (pH 7.2). Pavement is a significant ground cover component. Indicators of soil erosion include small shallow gullies and pedestalling around plants. There is good ground cover under shrub crowns, but the interspaces are largely bare. The relative bare ground cover was 13% in 1996 and 2006 and 21% in 2001. Due to the gentle terrain, erosion is not significant and the erosion condition class was stable in 2001 and 2006.

Browse

Wyoming big sagebrush is the only abundant shrub. It has a moderately high density with canopy cover that averaged 23% in 1996 and 26% in 2001 and 2006. Decadence was high in 1990 and 26% of the population had reduced vigor due to insect damage. Sagebrush density increased from 5,940 plants/acre in 1996 to 8,560 in 2001, and 8,100 in 2006. During the 1996 and 2001 readings, utilization of sagebrush was moderate and in 2006 utilization was light. Vigor has been normal on most plants and decadence has fluctuated from 55% in 1990 to 23% in 2001. Recruitment has been good with adequate numbers of seedlings and young plants to maintain the population.

A few shadscale, narrowleaf low rabbitbrush, greasewood, and prickly pear also occupy the site. Point-quarter data estimated the scattered junipers to have a density of 32 trees/acre in 1990, 47 trees/acre in 1996, 58 trees/acre in 2001, and 61 trees/acre in 2006. The average diameter of juniper was 3.8 inches in 2001 and 2.3 inches in 2006. Some of these trees have been highlined.

Herbaceous Understory

The understory is comprised mainly of the native grasses Sandberg bluegrass and bluebunch wheatgrass. Perennial grasses have provided 10-12% cover since 1996. Spring forb forage is lacking. The most abundant species are longleaf phlox, Hood's phlox, and rose pussytoes. Grasses and forbs combined produced only about 12% ground cover in 1996 and 2001, and 15% in 2006.

1996 TREND ASSESSMENT

Trend for Wyoming big sagebrush is also stable. Density is slightly lower, but vigor has improved and decadence has declined from 55% to 25% of the population. The grass trend is stable. The nested frequency of perennial grasses did not change. The forb trend is stable. The nested frequency of perennial forbs increased 34%, but most of the increase was due to a significant increase in Hood's phlox which has only a poor to fair palatability for mule deer in Utah (Howard 1992). The Desirable Components Index score is excellent due to excellent browse cover, moderate browse decadence, good perennial grass cover, and moderate perennial forb cover.

winter range condition (DC Index) - excellent (67) Lower potential scale
browse - stable (0) grass - stable (0) forb - stable (0)

2001 TREND ASSESSMENT

The trend for Wyoming big sagebrush is up. Utilization is light to moderate. Density has increased 31%, vigor is normal on most plants, and decadence is relatively low at 23%. Approximately 7% of the population were classified as dying, but young plants account for 23% of the population. The grass trend is stable. The nested frequency of perennial grasses remained unchanged. The nested frequency of bluebunch wheatgrass increased significantly and bottlebrush squirreltail decreased significantly. The forb trend is stable. The nested frequency of perennial forbs decreased slightly, but this was due mainly to a significant decrease in longleaf phlox, which provides little winter forage for mule deer. The DCI score remained excellent.

winter range condition (DC Index) - excellent (73) Lower potential scale
browse - up (+2) grass - stable (0) forb - stable (0)

2006 TREND ASSESSMENT

The browse trend is stable. Wyoming big sagebrush density changed little, percent decadence increased slightly, plants with poor vigor increased slightly, but use decreased to light. The grass trend is slightly up. The nested frequency of perennial grasses increased 12%, which is due to significant increases in the nested frequencies of western wheatgrass and bottlebrush squirreltail. Cheatgrass nested frequency also increased, but provides less than 1% cover. The forb trend is stable. The nested frequency of perennial forbs increased due to a significant increase in rose pussytoes, but this species provides little forage for big game. The DCI score remained excellent.

winter range condition (DC Index) - excellent (71) Lower potential scale
browse - stable (0) grass - slightly up (+1) forb - stable (0)

HERBACEOUS TRENDS --
Management unit 04 , Study no: 13

| T y p e | Species | Nested Frequency | | | | Average Cover % | | |
|-----------------------------|----------------------|------------------|------|-------|------|-----------------|-------|-------|
| | | '90 | '96 | '01 | '06 | '96 | '01 | '06 |
| G | Agropyron cristatum | - | - | - | 3 | - | - | .03 |
| G | Agropyron smithii | a- | a- | b14 | c36 | - | .08 | .43 |
| G | Agropyron spicatum | c71 | a15 | b47 | ab24 | .26 | 1.02 | .55 |
| G | Bromus tectorum (a) | - | a27 | a29 | b45 | .05 | .10 | .18 |
| G | Carex sp. | 1 | - | - | 1 | - | - | .00 |
| G | Oryzopsis hymenoides | 7 | 8 | 3 | 5 | .22 | .01 | .06 |
| G | Poa secunda | ab307 | b310 | ab294 | a281 | 8.73 | 8.43 | 8.80 |
| G | Sitanion hystrix | ab23 | b38 | a7 | c63 | .39 | .21 | 1.27 |
| G | Stipa comata | 16 | 15 | 36 | 35 | .54 | .52 | .76 |
| Total for Annual Grasses | | 0 | 27 | 29 | 45 | 0.05 | 0.10 | 0.18 |
| Total for Perennial Grasses | | 425 | 386 | 401 | 448 | 10.15 | 10.28 | 11.92 |
| Total for Grasses | | 425 | 413 | 430 | 493 | 10.21 | 10.39 | 12.10 |

| Type | Species | Nested Frequency | | | | Average Cover % | | |
|---------------------------|---------------------------------|------------------|------------------|-------------------|------------------|-----------------|------|------|
| | | '90 | '96 | '01 | '06 | '96 | '01 | '06 |
| F | <i>Agoseris glauca</i> | - | 1 | - | - | .00 | - | - |
| F | <i>Allium</i> sp. | - | - | - | 5 | - | - | .02 |
| F | <i>Antennaria rosea</i> | _a 17 | _a 24 | _{ab} 32 | _b 52 | .38 | .20 | .66 |
| F | <i>Arabis</i> sp. | 4 | 3 | - | - | .00 | - | - |
| F | <i>Astragalus convallarius</i> | - | - | 2 | 6 | - | .03 | .06 |
| F | <i>Astragalus spatulatus</i> | _a - | _{ab} 9 | _b 14 | _a - | .09 | .07 | .00 |
| F | <i>Astragalus utahensis</i> | - | 3 | 3 | - | .00 | .00 | - |
| F | <i>Cordylanthus ramosus</i> (a) | - | - | _b 49 | _a 22 | - | .59 | .28 |
| F | <i>Cryptantha</i> sp. | - | 1 | - | 8 | .03 | - | .07 |
| F | <i>Erigeron pumilus</i> | 13 | 10 | 6 | 13 | .02 | .01 | .05 |
| F | <i>Lappula occidentalis</i> (a) | - | - | 1 | - | - | .00 | - |
| F | <i>Orobanche</i> sp. | - | 3 | - | - | .00 | - | - |
| F | <i>Phlox hoodii</i> | _a 90 | _b 119 | _{ab} 114 | _{ab} 96 | 1.39 | 1.26 | 1.84 |
| F | <i>Phlox longifolia</i> | _b 43 | _b 50 | _a 14 | _{ab} 37 | .12 | .06 | .25 |
| Total for Annual Forbs | | 0 | 0 | 50 | 22 | 0 | 0.59 | 0.28 |
| Total for Perennial Forbs | | 167 | 223 | 185 | 217 | 2.05 | 1.64 | 2.97 |
| Total for Forbs | | 167 | 223 | 235 | 239 | 2.05 | 2.24 | 3.25 |

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

BROWSE TRENDS --

Management unit 04 , Study no: 13

| Type | Species | Strip Frequency | | | Average Cover % | | |
|------------------|--|-----------------|-----|-----|-----------------|-------|-------|
| | | '96 | '01 | '06 | '96 | '01 | '06 |
| B | <i>Artemisia tridentata wyomingensis</i> | 99 | 95 | 98 | 23.40 | 25.77 | 26.35 |
| B | <i>Atriplex confertifolia</i> | 3 | 2 | 2 | - | .03 | .03 |
| B | <i>Chrysothamnus viscidiflorus viscidiflorus</i> | 15 | 10 | 10 | .09 | .33 | .18 |
| B | <i>Juniperus osteosperma</i> | 1 | 1 | 2 | .00 | - | .30 |
| B | <i>Opuntia</i> sp. | 18 | 18 | 21 | .04 | .07 | .20 |
| B | <i>Sarcobatus vermiculatus</i> | 1 | 0 | 0 | - | - | - |
| Total for Browse | | 137 | 126 | 133 | 23.54 | 26.20 | 27.07 |

CANOPY COVER, LINE INTERCEPT --
Management unit 04 , Study no: 13

| Species | Percent Cover |
|---|---------------|
| | '06 |
| Artemisia tridentata wyomingensis | 24.10 |
| Atriplex confertifolia | .16 |
| Chrysothamnus viscidiflorus viscidiflorus | .60 |
| Opuntia sp. | .11 |

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 04 , Study no: 13

| Species | Average leader growth (in) | |
|-----------------------------------|----------------------------|-----|
| | '01 | '06 |
| Artemisia tridentata wyomingensis | 0.8 | 0.6 |

POINT-QUARTER TREE DATA --
Management unit 04 , Study no: 13

| Species | Trees per Acre | | Average diameter (in) | |
|-----------------------|----------------|-----|-----------------------|-----|
| | '01 | '06 | '01 | '06 |
| Juniperus osteosperma | 58 | 61 | 3.8 | 2.3 |

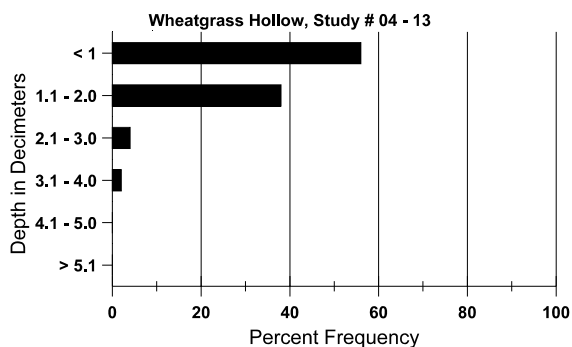
BASIC COVER --
Management unit 04 , Study no: 13

| Cover Type | Average Cover % | | | |
|-------------|-----------------|-------|-------|-------|
| | '90 | '96 | '01 | '06 |
| Vegetation | 8.00 | 34.17 | 39.87 | 43.31 |
| Rock | 5.50 | 3.24 | 2.07 | 2.56 |
| Pavement | 27.00 | 17.76 | 18.94 | 23.85 |
| Litter | 34.50 | 25.90 | 27.56 | 21.83 |
| Cryptogams | 8.50 | 8.83 | 8.57 | 6.66 |
| Bare Ground | 16.50 | 15.49 | 26.14 | 14.37 |

SOIL ANALYSIS DATA --
Herd Unit 04, Study no: 13, Wheatgrass Hollow

| Effective rooting depth (in) | Temp °F (depth) | PH | Sandy clay loam | | | %OM | PPM P | PPM K | dS/m |
|------------------------------|-----------------|-----|-----------------|-------|-------|-----|-------|-------|------|
| | | | %sand | %silt | %clay | | | | |
| 10.4 | 58.6 (11.5) | 7.2 | 49.0 | 22.0 | 29.0 | 4.5 | 10.3 | 204.8 | 0.7 |

Stoniness Index



PELLET GROUP DATA --

Management unit 04 , Study no: 13

| Type | Quadrat Frequency | | |
|----------|-------------------|-----|-----|
| | '96 | '01 | '06 |
| Rabbit | 10 | 3 | 26 |
| Horse | - | 1 | 1 |
| Elk | 4 | 4 | 4 |
| Deer | 38 | 20 | 17 |
| Cattle | 1 | 1 | - |
| Antelope | - | - | 1 |

| Days use per acre (ha) | |
|------------------------|---------|
| '01 | '06 |
| - | - |
| 1 (3) | - |
| 1 (2) | 2 (5) |
| 58 (144) | 28 (69) |
| - | - |
| - | - |

BROWSE CHARACTERISTICS --

Management unit 04 , Study no: 13

| | | 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> | | | | | | | | | | | | |
| 90 | 6599 | 266 | 1666 | 1333 | 3600 | - | 24 | 19 | 55 | .90 | 19 | 19/23 |
| 96 | 5940 | 1120 | 640 | 3840 | 1460 | 1180 | 60 | 8 | 25 | 5 | 5 | 14/33 |
| 01 | 8560 | 260 | 1960 | 4660 | 1940 | 860 | 28 | 6 | 23 | 7 | 7 | 15/28 |
| 06 | 8100 | 4680 | 1000 | 4580 | 2520 | 760 | 2 | 1 | 31 | 11 | 12 | 13/28 |
| <i>Atriplex confertifolia</i> | | | | | | | | | | | | |
| 90 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | -/- |
| 96 | 60 | - | - | 60 | - | - | 0 | 0 | - | - | 0 | 11/10 |
| 01 | 40 | - | - | 40 | - | 40 | 0 | 0 | - | - | 0 | 15/12 |
| 06 | 40 | - | - | 40 | - | - | 0 | 50 | - | - | 0 | 14/15 |

| | | 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) |
| Chrysothamnus nauseosus | | | | | | | | | | | | |
| 90 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | -/- |
| 96 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | -/- |
| 01 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | 3/35 |
| 06 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | 25/35 |
| Chrysothamnus viscidiflorus viscidiflorus | | | | | | | | | | | | |
| 90 | 66 | 66 | - | 66 | - | - | 100 | 0 | 0 | - | 0 | 6/8 |
| 96 | 460 | - | 60 | 340 | 60 | - | 0 | 0 | 13 | 9 | 9 | 10/16 |
| 01 | 280 | - | 40 | 220 | 20 | - | 14 | 0 | 7 | - | 0 | 10/18 |
| 06 | 240 | - | 20 | 140 | 80 | - | 0 | 0 | 33 | 8 | 17 | 10/17 |
| Juniperus osteosperma | | | | | | | | | | | | |
| 90 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | -/- |
| 96 | 20 | - | 20 | - | - | - | 0 | 0 | - | - | 0 | -/- |
| 01 | 20 | - | - | 20 | - | - | 0 | 0 | - | - | 0 | -/- |
| 06 | 40 | - | 20 | 20 | - | - | 0 | 0 | - | - | 0 | -/- |
| Opuntia sp. | | | | | | | | | | | | |
| 90 | 333 | 66 | 133 | 200 | - | - | 0 | 0 | 0 | - | 0 | 3/2 |
| 96 | 540 | 40 | - | 540 | - | - | 0 | 0 | 0 | - | 0 | 4/13 |
| 01 | 720 | - | 60 | 540 | 120 | - | 8 | 0 | 17 | - | 0 | 3/12 |
| 06 | 620 | 60 | 60 | 500 | 60 | - | 0 | 0 | 10 | - | 0 | 4/14 |
| Sarcobatus vermiculatus | | | | | | | | | | | | |
| 90 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | -/- |
| 96 | 20 | - | - | 20 | - | - | 0 | 0 | - | - | 0 | 24/18 |
| 01 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | -/- |
| 06 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | 30/23 |