

Trend Study 17-46-07

Study site name: Lower Tank Hollow .

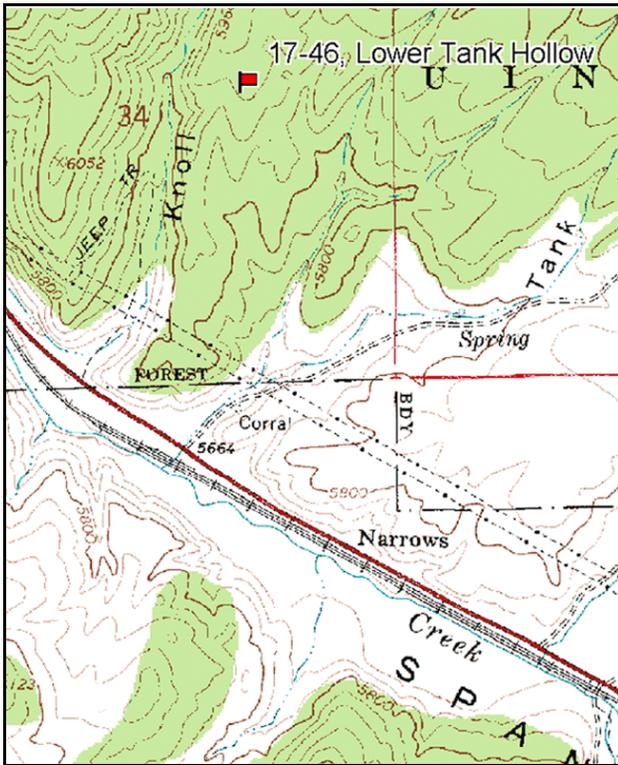
Vegetation type: Chained, Seeded P-J .

Compass bearing: frequency baseline 175 degrees magnetic.

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

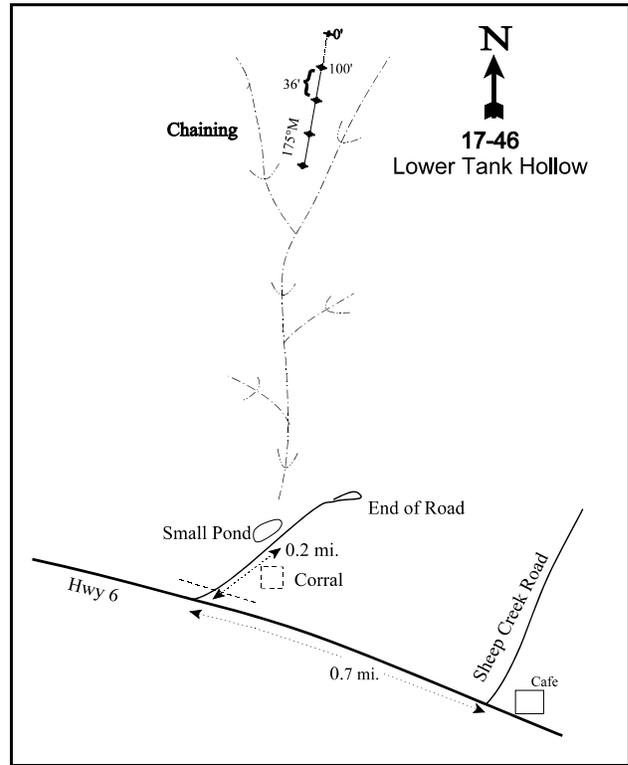
LOCATION DESCRIPTION

In Spanish Fork Canyon, turn north up Tank Hollow, which is 0.7 miles west of the Sheep Creek Road and cafe on Highway 6. Drive about 0.2 miles and stop by a small stock pond in the forks of the drainage. From here, walk north about 1/2 mile up the left fork, and keep left at two other major forks. Where the wash starts to flatten out at the head, there is a chained ridge to the right. The study site is on the ridge, about 20 paces from the center of the drainage. The 0-foot baseline stake is near the highest point on the ridge.



Map Name: Mill Fork

Township 9S, Range 5E, Section 34



Diagrammatic Sketch

GPS: NAD 83, UTM 12S 470019 E 4426679 N

DISCUSSION

Lower Tank Hollow - Trend Study No. 17-46

Study Information

This critical winter study samples a chaining and seeding treatment in Lower Tank Hollow that was completed in 1971 [elevation: 5,900 feet (1,798 m), slope: 10%, aspect: southwest]. The nearest perennial source of water is Soldier Creek 0.7 miles (1.1 km) to the south. There is a stock pond 0.5 miles (0.8 km) to the south that was dry when the study was sampled in 2007. The study is located on a small ridge that is part of the Forest Service Diamond Fork cattle allotment. When not rested, it appears to receive moderate cattle use. There has also been moderate deer use and light elk use. From the pellet group transect data, deer use was estimated at 47 days use/acre (116 ddu/ha) in 2002 and 24 days use/acre (60 ddu/ha) in 2007. Elk use was estimated at 5 days use/acre (13 edu/ha) in 2002 and 12 days use/acre (30 edu/ha) in 2007. Most of the big game use appears to be during the winter. Cattle use was estimated at 7 days use/acre (16 cdu/ha) in 2002 and 8 days use/acre (20 cdu/ha) in 2007. Livestock were present when the study was sampled in 2002, and had only lightly grazed the forage on the study. However, on the lower portions of the chaining down the slope, the grazing had been heavy.

Soil

The soil has a clay loam texture and a neutral soil reaction (pH of 7.2). It is underlain by a layer of shale. Soil phosphorous is moderate (6.8 ppm), but close to the threshold 6 ppm required for normal plant growth and development (Tiedemann and Lopez 2004). Relative vegetation cover has been approximately 31% since 1997. Relative bare ground cover increased from 22% in 1997 to 37% by 2007. There is evidence of substantial past erosion in the form of exposed roots and pedestalled plants, but there has not been evidence of significant erosion since 1989. The erosion condition was classified as slight in 2002 and 2007 due to the abundance of flow paths and soil movement.

Browse

Before the 1971 chaining and seeding, the overstory was dominated by a mature stand of pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*). The chaining was effective in pulling the trees over, but several of the juniper trees survived. Not all of the population is comprised of chained trees that survived, however, some are trees that have grown since the chaining. In 2002, 35% of the population were trees that had survived the chaining, and in 2007, surviving trees decreased to 15%. The point-quarter tree density increased from 57 trees/acre (141 trees/ha) in 1997 to 74 trees/acre (183 trees/ha) in 2002. In 2007, the density had slightly increased to 75 trees/acre (186 trees/ha). The average diameter has increased from 5.8 inches (14.7 cm) in 1997 to 7.0 inches (17.8 cm) in 2007. Juniper canopy cover was estimated at 6% in 2002 and 13% in 2007.

Preferred browse is somewhat limited. Basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*) and antelope bitterbrush (*Purshia tridentata*) are the most abundant preferred species. The sagebrush canopy cover has been 1% since 2002. The estimated sagebrush density increased from 99 plants/acre (245 plants/ha) in 1989 to 420 plants/acre (1,040 plants/ha) in 1997, and steadily decreased to 220 plants/acre (545 plants/ha) by 2007. No seedling plants have been sampled, and young plants have decreased from 33% of the population in 1989 to 9% in 2007. Decadence decreased from 33% of the population in 1989 to a low of 14% in 1997, and increased to a high of 55% by 2007. The density of dead plants has been stable at 60 plants/acre (149 plants/ha) since 1997. Plants with poor vigor decreased from 33% of the population in 1989 to 10% in 1997, and were approximately 20% in 2002 and 2007. Since 1997, half to all of the plants with poor vigor were classified as dying. In 2007, 45% of the population was infested with the sagebrush defoliator moth (*Aroga websteri*). However, the infestation may not have a long-term effect on the sagebrush population (Hsiao 1986). The average annual leader growth was 1.5 inches (3.8 cm) in 2002 and 1.9 inches (4.9 cm) in 2007. Browse use on sagebrush has ranged from light (1997) to light-moderate (2007) and heavy (1989, 2002). The

changes in decadence and vigor are consistent with changes in precipitation. Drought conditions prevailed in 1989 and 2002, while conditions were wetter than normal in 1997 (Utah Climate Summaries 2007).

The canopy cover of bitterbrush was 2% in 2002 and 2007. The estimated density of bitterbrush has steadily increased from 33 plants/acre (82 plants/ha) in 1989 to 400 plants/acre (990 plants/ha) in 2007. No seedling plants have been sampled, and young bitterbrush were only sampled in 1997, comprising 17% of the population. There were no decadent plants in either 1989 or 1997, but 69% of the population was decadent in 2002, and 5% in 2007. Dead plants were first sampled in 2002 and were present at a density of 20 plants/acre (50 plants/ha). In 2007, the density of dead plants increased to 120 plants/acre (297 plants/ha). Vigor has been good, except in 2002 when 38% of the population had poor vigor and was classified as dying. The average annual leader growth of bitterbrush was 1.6 inches (4.1 cm) in 2002 and 2.3 inches (5.9 cm) in 2007. Browse use has been heavy in all sample years.

Other, low-density populations of browse species include Utah serviceberry (*Amelanchier utahensis*), dwarf rabbitbrush (*Chrysothamnus depressus*), white rubber rabbitbrush (*Chrysothamnus nauseosus* ssp. *albicaulis*), Parry's rabbitbrush (*Chrysothamnus parryi*), Woods' rose (*Rosa woodsii*), and snowberry (*Symphoricarpos oreophilus*). Browse use has been light on all but serviceberry, Parry's rabbitbrush, and snowberry. Stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*) is the most abundant browse species, but browse use has been light in all sample years.

Herbaceous Understory

The herbaceous understory is diverse and fairly abundant. Perennial grass cover was 19% in 1997, 16% in 2002, and 19% in 2007. Between six and 10 perennial species have been sampled. Cover of crested wheatgrass, which is the dominant perennial grass, increased from 13% in 1997 to 18% by 2007. Other seeded grasses include intermediate wheatgrass (*Agropyron intermedium*), smooth brome (*Bromus inermis*), and orchardgrass (*Dactylis glomerata*). Cover of these three species has been less than 1%. Cheatgrass (*Bromus tectorum*) and Japanese brome (*Bromus japonicus*) are the only annual species present, but are not abundant.

Perennial forb cover was 5% in 1997, and 2% in 2002 and 2007. Between 13 and 26 perennial species have been sampled, but none of them are common. Only two perennial species, western aster (*Aster chilensis*) in 1997, and Hood's phlox (*Phlox hoodii*) in 2007, have provided 1% cover or more. Otherwise, individual perennial species have comprised less than 1% cover. Two noxious weeds, whitetop (*Cardaria draba*) and musk thistle (*Carduus nutans*), have been sampled at quadrat frequencies of 13% or less.

1997 TREND ASSESSMENT

The browse trend is slightly up. The density of sagebrush increased more than four-fold. However, much of the increase is likely the result of the larger area sampled beginning in 1997. The density of young plants increased, but the proportion of young plants decreased from 33% of the population to 24%. Likewise, the density of decadent plants increased, but the proportion of decadent plants decreased from 33% of the population to 14%. Dead plants were sampled at a density of 60 plants/acre (147 plants/ha). Plants with poor vigor decreased from 33% of the population to 10%, but whereas there were no dying plants in 1989, all of the plants with poor vigor were classified as dying in 1997. Heavily browsed sagebrush plants decreased from 67% of the population to 5%. The average sagebrush height and crown measurements increased 14 inches (36 cm) and 16 inches (41 cm), respectively. The bitterbrush population increased nearly four-fold. Young plants increased from 0% of the population to 17%, and there continued to be no decadent plants. Bitterbrush vigor remained good, and heavily browsed plants decreased from 100% of the population to 67%. The average bitterbrush crown width increased 20 inches (51 cm). The grass trend is up. The sum of nested frequency of perennial grasses increased 43%. There were significant increases in the nested frequencies of crested wheatgrass and bluebunch wheatgrass (*Agropyron spicatum*). The nested frequencies of smooth brome, Indian ricegrass (*Oryzopsis hymenoides*), and mutton bluegrass (*Poa fendleriana*) significantly decreased. Cheatgrass

was sampled in 14% of the quadrats. The forb trend is up. Excluding noxious weeds, the sum of nested frequency of perennial forbs increased 43%, and the number of perennial species sampled increased from 13 to 26. There were significant increases in the nested frequencies of Douglas chaenactis (*Chaenactis douglasii*) and yellow salsify (*Tragopogon dubius*). The nested frequencies of thistle (*Cirsium* sp.) and shortstem wild buckwheat (*Eriogonum brevicaulle*) significantly decreased. Musk thistle was sampled for the first time, and had a quadrat frequency of 13%. The Desirable Components Index (DCI) score was poor due to the low browse cover (less than the 5% threshold), and the presence of one noxious weed species. These factors were countered by the high perennial grass and forb cover.

winter range condition (DCI) - poor (43) Mid-level potential scale
browse - slightly up (+1) grass - up (+2) forb - up (+2)

2002 TREND ASSESSMENT

The browse trend is slightly down. The density of sagebrush decreased 10%, and young plants decreased to 11% of the population. Decadence increased to 37% of the population, but the density of dead plants remained constant. Sagebrush plants with poor vigor increased to 21% of the population, and approximately half of those plants were classified as dying. Browse use shifted from light to heavy, and heavily browsed plants increased to 68% of the population. The density of bitterbrush increased more than two-fold. However, no young plants were sampled, and decadence increased from 0% of the population to 69%. Dead plants were sampled for the first time and had a density of 20 plants/acre (50 plants/ha). Dying bitterbrush plants increased to 38% of the population. All the bitterbrush plants were heavily browsed. The grass trend is stable. The sum of nested frequency of perennial grasses decreased 11%, including significant decreases in the nested frequencies of bluebunch wheatgrass, Kentucky bluegrass (*Poa pratensis*), and Sandberg bluegrass (*Poa secunda*). However, there was a significant increase in the nested frequency of crested wheatgrass, and a significant decrease in that of cheatgrass. Crested wheatgrass is likely out-competing cheatgrass, and may be negatively affecting the other perennial species as well. The forb trend is down. Excluding noxious weeds, the sum of nested frequency of perennial forbs decreased 66%. There were significant decreases in the nested frequencies of four perennial species, and the number of perennial species sampled declined to 15. Musk thistle was not sampled, but whitetop was sampled in four quadrats. Although browse cover increased above 5%, the DCI score remained poor because of the decrease in perennial forb cover.

winter range condition (DCI) - poor (39) Mid-level potential scale
browse - slightly down (-1) grass - stable (0) forb - down (-2)

2007 TREND ASSESSMENT

The browse trend is down. The density of sagebrush decreased 42%, and young plants decreased slightly to 9% of the population. Decadence increased to 55% of the population, but the density of dead plants remained constant. Sagebrush plants with poor vigor decreased slightly to 18% of the population, but all of those plants were classified as dying. As mentioned above, the sagebrush defoliator moth had infested 45% of the population. Browse use on sagebrush shifted to light-moderate, and only 18% of the population was heavily browsed. The density of bitterbrush increased 54%. There were no young plants sampled, but decadence decreased to 5% of the population. All of the plants were vigorous, despite being 100% heavily browsed. However, the average bitterbrush crown width decreased 26 inches (64 cm). The grass trend is slightly down. The sum of nested frequency of perennial grasses decreased 6%, and the number of perennial species sampled decreased from 10 to six. There was a significant increase in the nested frequency of Sandberg bluegrass. Japanese brome was sampled for the first time and had a quadrat frequency of 6%. The forb trend is up. Excluding noxious weeds, the sum of nested frequency of perennial forbs increased 25%, and the number of perennial species sampled increased to 20. There was a significant increase in the nested frequency of timber poisonvetch (*Astragalus convallarius*). Whitetop was not sampled, but musk thistle was sampled in 2 quadrats. The DCI score decreased to very poor-poor because browse cover decreased to less than 5%.

winter range condition (DCI) - very poor-poor (36) Mid-level potential scale
 browse - down (-2) grass - slightly down (-1) forb - up (+2)

HERBACEOUS TRENDS --
 Management unit 17 , Study no: 46

| T y p e | Species | Nested Frequency | | | | Average Cover % | | |
|-----------------------------|--------------------------|------------------|------------------|------------------|------------------|-----------------|-------|-------|
| | | '89 | '97 | '02 | '07 | '97 | '02 | '07 |
| G | Agropyron cristatum | _a 71 | _b 164 | _c 224 | _c 238 | 12.57 | 14.51 | 17.55 |
| G | Agropyron intermedium | _a 31 | _a 19 | _a 23 | _a 12 | .18 | .19 | .16 |
| G | Agropyron spicatum | _a 7 | _b 36 | _a 4 | _a 3 | 2.79 | .03 | .06 |
| G | Bromus inermis | _b 30 | _a 7 | - | - | .21 | - | - |
| G | Bromus japonicus (a) | - | - | - | 14 | - | - | .08 |
| G | Bromus tectorum (a) | - | _b 29 | _a 6 | _a 9 | .51 | .01 | .04 |
| G | Dactylis glomerata | - | _a 1 | _a 3 | - | .03 | .01 | - |
| G | Leucopoa kingii | 11 | - | - | - | - | - | - |
| G | Oryzopsis hymenoides | _b 56 | _a 30 | _a 36 | _a 23 | .68 | .79 | .47 |
| G | Poa fendleriana | _b 36 | _a 1 | _a 1 | - | .03 | .00 | - |
| G | Poa pratensis | - | _b 59 | _a 15 | _a 3 | 1.44 | .33 | .00 |
| G | Poa secunda | - | _b 20 | _a 3 | _b 15 | .55 | .03 | .38 |
| G | Sitanion hystrix | - | - | 1 | - | - | .00 | - |
| G | Stipa comata | 4 | - | - | - | - | - | - |
| G | Stipa lettermani | - | _a 14 | _a 4 | - | .72 | .06 | - |
| Total for Annual Grasses | | 0 | 29 | 6 | 23 | 0.50 | 0.00 | 0.11 |
| Total for Perennial Grasses | | 246 | 351 | 314 | 294 | 19.22 | 15.98 | 18.63 |
| Total for Grasses | | 246 | 380 | 320 | 317 | 19.73 | 15.99 | 18.75 |
| F | Achillea millefolium | - | 1 | - | - | .00 | - | - |
| F | Agoseris glauca | - | _a 5 | - | _a 2 | .01 | - | .01 |
| F | Alyssum alyssoides (a) | - | _b 63 | _a 2 | _c 120 | 1.16 | .01 | .55 |
| F | Allium sp. | - | _a 10 | _a 2 | _a 6 | .02 | .00 | .01 |
| F | Aster chilensis | _b 100 | _b 93 | _a 22 | _a 9 | 1.16 | .26 | .12 |
| F | Astragalus convallarius | _a 13 | _b 25 | _a 3 | _b 28 | .36 | .03 | .26 |
| F | Astragalus sp. | 3 | - | - | - | - | - | - |
| F | Astragalus utahensis | _a 5 | _a 4 | - | _a 3 | .06 | - | .01 |
| F | Cardaria draba | - | - | 12 | - | - | .04 | - |
| F | Castilleja linariaefolia | - | 8 | - | - | .04 | - | - |
| F | Camelina microcarpa (a) | - | _b 13 | _a 1 | _{ab} 3 | .03 | .00 | .01 |
| F | Carduus nutans (a) | - | _b 22 | - | _a 4 | .37 | - | .01 |
| F | Calochortus nuttallii | - | _a 2 | - | _a 1 | .01 | - | .00 |
| F | Chaenactis douglasii | _a 2 | _b 19 | - | _{ab} 4 | .12 | - | .01 |

| Type | Species | Nested Frequency | | | | Average Cover % | | |
|---------------------------|-----------------------------|------------------|-------------------|------------------|-------------------|-----------------|------|------|
| | | '89 | '97 | '02 | '07 | '97 | '02 | '07 |
| F | Cirsium sp. | c ₃ 9 | b ₂ 22 | ab ₄ | a ₃ | .45 | .06 | .00 |
| F | Comandra pallida | - | 32 | - | - | .40 | - | - |
| F | Crepis acuminata | - | 1 | - | - | .00 | - | - |
| F | Descurainia pinnata (a) | - | a ₄ | - | a ₃ | .02 | - | .01 |
| F | Epilobium brachycarpum (a) | - | 1 | - | - | .00 | - | - |
| F | Eriogonum brevicaulle | b ₂ 1 | a ₁ 0 | a ₈ | a ₂ | .33 | .46 | .06 |
| F | Erigeron pumilus | b ₂ 7 | - | a ₂ | - | - | .00 | - |
| F | Hackelia patens | a ₄ | a ₄ | - | a ₃ | .04 | - | .03 |
| F | Hedysarum boreale | - | 4 | - | - | .18 | - | - |
| F | Iva axillaris | - | - | - | 17 | - | - | .30 |
| F | Lappula occidentalis (a) | - | 10 | - | - | .19 | - | - |
| F | Lactuca serriola | - | - | - | 3 | - | - | .00 |
| F | Lithospermum ruderales | - | a ₁ 8 | a ₁ 3 | a ₄ | .46 | .28 | .04 |
| F | Lomatium sp. | - | 3 | - | - | .01 | - | - |
| F | Machaeranthera canescens | a ₉ | - | - | a ₂ | - | - | .03 |
| F | Penstemon caespitosus | - | a ₇ | a ₁ 0 | a ₄ | .33 | .04 | .03 |
| F | Phlox hoodii | a ₁ 5 | a ₁ 6 | a ₁ 9 | a ₂ 0 | .42 | .42 | .63 |
| F | Phlox longifolia | a ₁ 1 | a ₁ 1 | a ₁ 8 | a ₁ 5 | .02 | .06 | .08 |
| F | Ranunculus testiculatus (a) | - | a ₄ | - | a ₈ | .01 | - | .02 |
| F | Salsola pestifer (a) | 8 | - | - | - | - | - | - |
| F | Sphaeralcea coccinea | - | a ₃ | a ₅ | a ₂ | .15 | .01 | .01 |
| F | Taraxacum officinale | - | a ₂ | a ₁ | - | .00 | .00 | - |
| F | Tragopogon dubius | a ₂ | b ₁ 7 | a ₄ | a ₂ | .10 | .03 | .00 |
| F | Verbascum thapsus | - | 5 | - | - | .03 | - | - |
| F | Vicia americana | - | b ₃ 5 | a ₁ 1 | ab ₂ 3 | .27 | .05 | .22 |
| F | Viola sp. | - | 3 | - | - | .15 | - | - |
| Total for Annual Forbs | | 8 | 117 | 3 | 138 | 1.79 | 0.01 | 0.60 |
| Total for Perennial Forbs | | 251 | 360 | 134 | 153 | 5.19 | 1.79 | 1.92 |
| Total for Forbs | | 259 | 477 | 137 | 291 | 6.99 | 1.81 | 2.52 |

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

BROWSE TRENDS --

Management unit 17 , Study no: 46

| T y p e | Species | Strip Frequency | | | Average Cover % | | |
|------------------|--|-----------------|-----|-----|-----------------|-------|-------|
| | | '97 | '02 | '07 | '97 | '02 | '07 |
| B | Amelanchier utahensis | 4 | 3 | 2 | .78 | .53 | .41 |
| B | Artemisia tridentata tridentata | 17 | 18 | 11 | 1.04 | 1.73 | .36 |
| B | Chrysothamnus depressus | 13 | 3 | 4 | .43 | - | .15 |
| B | Chrysothamnus nauseosus albicaulis | 3 | 1 | 1 | .00 | - | - |
| B | Chrysothamnus parryi | 0 | 11 | 10 | - | .40 | .40 |
| B | Chrysothamnus viscidiflorus viscidiflorus | 34 | 37 | 28 | 1.88 | 1.71 | .85 |
| B | Gutierrezia sarothrae | 10 | 19 | 5 | .36 | .07 | .04 |
| B | Juniperus osteosperma | 10 | 8 | 10 | 6.30 | 10.64 | 7.44 |
| B | Opuntia sp. | 3 | 8 | 6 | .18 | .01 | .18 |
| B | Purshia tridentata | 5 | 10 | 10 | 1.49 | 3.17 | 2.02 |
| B | Rhus trilobata | 0 | 1 | 0 | - | - | - |
| B | Rosa woodsii | 0 | 1 | 0 | - | - | .03 |
| B | Symphoricarpos oreophilus | 3 | 5 | 5 | .15 | .15 | .04 |
| Total for Browse | | 102 | 125 | 92 | 12.64 | 18.44 | 11.94 |

CANOPY COVER, LINE INTERCEPT --

Management unit 17 , Study no: 46

| Species | Percent Cover | |
|--|---------------|-------|
| | '02 | '07 |
| Amelanchier utahensis | 1.28 | .76 |
| Artemisia tridentata tridentata | 1.31 | .78 |
| Chrysothamnus depressus | .06 | .08 |
| Chrysothamnus parryi | .45 | .61 |
| Chrysothamnus viscidiflorus viscidiflorus | 1.38 | .58 |
| Gutierrezia sarothrae | .03 | - |
| Juniperus osteosperma | 5.83 | 13.19 |
| Opuntia sp. | - | .11 |
| Purshia tridentata | 2.43 | 2.34 |
| Symphoricarpos oreophilus | .18 | .40 |

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 17 , Study no: 46

| Species | Average leader growth (in) | |
|---------------------------------|----------------------------|-----|
| | '02 | '07 |
| Artemisia tridentata tridentata | 1.5 | 1.9 |
| Purshia tridentata | 1.6 | 2.3 |

POINT-QUARTER TREE DATA --

Management unit 17 , Study no: 46

| Species | Trees per Acre | | Average diameter (in) | |
|-----------------------|----------------|-----|-----------------------|-----|
| | '02 | '07 | '02 | '07 |
| Juniperus osteosperma | 74 | 75 | 6.4 | 7.0 |

BASIC COVER --

Management unit 17 , Study no: 46

| Cover Type | Average Cover % | | | |
|-------------|-----------------|-------|-------|-------|
| | '89 | '97 | '02 | '07 |
| Vegetation | 6.00 | 36.93 | 34.80 | 33.98 |
| Rock | 1.25 | .73 | 1.97 | .87 |
| Pavement | 9.75 | 5.83 | 3.66 | 4.63 |
| Litter | 45.25 | 41.37 | 40.40 | 28.22 |
| Cryptogams | 0 | 1.41 | 2.48 | 2.65 |
| Bare Ground | 37.75 | 24.28 | 35.84 | 40.81 |

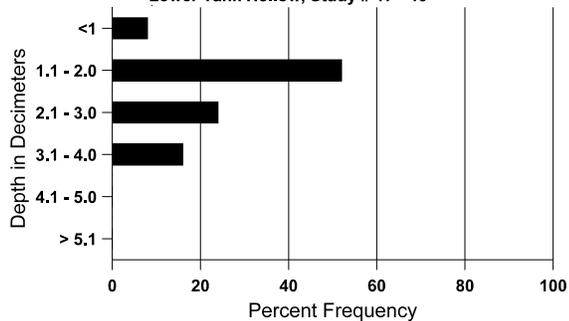
SOIL ANALYSIS DATA --

Herd Unit 17, Study no: 46, Lower Tank Hollow

| Effective rooting depth (in) | Temp °F (depth) | pH | Clay loam | | | %OM | ppm P | ppm K | dS/m |
|------------------------------|-----------------|-----|-----------|-------|-------|-----|-------|-------|------|
| | | | %sand | %silt | %clay | | | | |
| 13.2 | 45.8 (15.5) | 7.2 | 40.7 | 21.4 | 37.8 | 3.2 | 6.8 | 275.2 | .5 |

Stoniness Index

Lower Tank Hollow, Study # 17 - 46



PELLET GROUP DATA --

Management unit 17 , Study no: 46

| Type | Quadrat Frequency | | |
|--------|-------------------|-----|-----|
| | '97 | '02 | '07 |
| Rabbit | 3 | 8 | 7 |
| Elk | 11 | 14 | 4 |
| Deer | 30 | 36 | 42 |
| Cattle | 1 | 2 | 5 |

| Days use per acre (ha) | |
|------------------------|---------|
| '02 | '07 |
| - | - |
| 5 (13) | 12 (30) |
| 47 (116) | 24 (60) |
| 7 (16) | 8 (20) |

BROWSE CHARACTERISTICS --

Management unit 17 , Study no: 46

| | | 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) |
| Amelanchier utahensis | | | | | | | | | | | | |
| 89 | 0 | - | - | - | - | - | 0 | 0 | 0 | - | 0 | -/- |
| 97 | 100 | - | 40 | 60 | - | - | 0 | 60 | 0 | - | 0 | 28/36 |
| 02 | 60 | - | - | 40 | 20 | - | 0 | 100 | 33 | 33 | 33 | 32/38 |
| 07 | 40 | - | - | 40 | - | - | 50 | 50 | 0 | - | 0 | 39/41 |
| Artemisia tridentata tridentata | | | | | | | | | | | | |
| 89 | 99 | - | 33 | 33 | 33 | - | 0 | 67 | 33 | - | 33 | 26/22 |
| 97 | 420 | - | 100 | 260 | 60 | 60 | 10 | 5 | 14 | 10 | 10 | 40/38 |
| 02 | 380 | - | 40 | 200 | 140 | 60 | 16 | 68 | 37 | 11 | 21 | 32/32 |
| 07 | 220 | - | 20 | 80 | 120 | 60 | 45 | 18 | 55 | 18 | 18 | 30/25 |
| Chrysothamnus depressus | | | | | | | | | | | | |
| 89 | 0 | - | - | - | - | - | 0 | 0 | 0 | - | 0 | -/- |
| 97 | 860 | 80 | 80 | 780 | - | - | 0 | 0 | 0 | - | 0 | 6/14 |
| 02 | 120 | - | - | 100 | 20 | - | 0 | 0 | 17 | - | 0 | 4/9 |
| 07 | 180 | - | - | 180 | - | - | 0 | 0 | 0 | - | 0 | 7/12 |
| Chrysothamnus nauseosus albicaulis | | | | | | | | | | | | |
| 89 | 33 | - | 33 | - | - | - | 0 | 0 | 0 | - | 0 | -/- |
| 97 | 60 | - | 40 | 20 | - | - | 33 | 0 | 0 | - | 0 | 24/27 |
| 02 | 20 | - | - | - | 20 | 20 | 0 | 0 | 100 | 100 | 100 | 26/40 |
| 07 | 40 | - | - | 40 | - | - | 0 | 0 | 0 | - | 0 | 19/15 |
| Chrysothamnus parryi | | | | | | | | | | | | |
| 89 | 0 | - | - | - | - | - | 0 | 0 | 0 | - | 0 | -/- |
| 97 | 0 | - | - | - | - | - | 0 | 0 | 0 | - | 0 | -/- |
| 02 | 900 | - | - | 740 | 160 | 100 | 60 | 16 | 18 | 11 | 11 | 6/13 |
| 07 | 520 | - | 120 | 400 | - | - | 23 | 0 | 0 | - | 0 | 8/11 |

| | | 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 viscidiflorus</i> | | | | | | | | | | | | |
| 89 | 3032 | - | 233 | 2533 | 266 | - | 0 | 0 | 9 | 5 | 5 | 11/12 |
| 97 | 1320 | - | 140 | 1040 | 140 | 20 | 0 | 2 | 11 | 2 | 2 | 14/14 |
| 02 | 2020 | - | 60 | 1340 | 620 | 20 | 16 | 5 | 31 | 13 | 18 | 8/12 |
| 07 | 1280 | - | 160 | 820 | 300 | - | 6 | 3 | 23 | 6 | 14 | 9/13 |
| <i>Eriogonum microthecum</i> | | | | | | | | | | | | |
| 89 | 33 | - | - | 33 | - | - | 0 | 0 | - | - | 0 | 4/8 |
| 97 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | -/- |
| 02 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | -/- |
| 07 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | -/- |
| <i>Gutierrezia sarothrae</i> | | | | | | | | | | | | |
| 89 | 0 | - | - | - | - | - | 0 | 0 | 0 | - | 0 | -/- |
| 97 | 480 | 60 | 100 | 360 | 20 | - | 0 | 0 | 4 | - | 0 | 11/11 |
| 02 | 680 | - | 20 | 360 | 300 | 140 | 3 | 3 | 44 | 35 | 41 | 8/10 |
| 07 | 160 | - | - | 140 | 20 | - | 0 | 0 | 13 | - | 0 | 9/9 |
| <i>Juniperus osteosperma</i> | | | | | | | | | | | | |
| 89 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | -/- |
| 97 | 220 | 40 | 80 | 140 | - | 40 | 0 | 9 | - | - | 0 | 74/101 |
| 02 | 160 | 20 | 20 | 140 | - | 40 | 0 | 0 | - | - | 0 | -/- |
| 07 | 200 | - | 40 | 160 | - | 20 | 0 | 0 | - | - | 0 | -/- |
| <i>Opuntia sp.</i> | | | | | | | | | | | | |
| 89 | 33 | 33 | - | 33 | - | - | 0 | 0 | - | - | 0 | 7/9 |
| 97 | 140 | 80 | 40 | 100 | - | - | 0 | 0 | - | - | 0 | 3/15 |
| 02 | 160 | - | 20 | 140 | - | - | 0 | 0 | - | - | 0 | 4/12 |
| 07 | 120 | - | 20 | 100 | - | - | 0 | 0 | - | - | 0 | 5/11 |
| <i>Purshia tridentata</i> | | | | | | | | | | | | |
| 89 | 33 | - | - | 33 | - | - | 0 | 100 | 0 | - | 0 | 10/35 |
| 97 | 120 | - | 20 | 100 | - | - | 17 | 67 | 0 | - | 0 | 16/55 |
| 02 | 260 | - | - | 80 | 180 | 20 | 0 | 100 | 69 | 38 | 38 | 16/57 |
| 07 | 400 | - | - | 380 | 20 | 120 | 0 | 100 | 5 | - | 0 | 15/31 |
| <i>Rhus trilobata</i> | | | | | | | | | | | | |
| 89 | 0 | - | - | - | - | - | 0 | 0 | 0 | - | 0 | -/- |
| 97 | 0 | - | - | - | - | - | 0 | 0 | 0 | - | 0 | -/- |
| 02 | 20 | - | - | - | 20 | - | 0 | 0 | 100 | - | 0 | -/- |
| 07 | 0 | - | - | - | - | - | 0 | 0 | 0 | - | 0 | 12/6 |

| | | 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) | |
| Rosa woodsii | | | | | | | | | | | | | |
| 89 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | -/- | |
| 97 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | -/- | |
| 02 | 20 | - | 20 | - | - | - | 0 | 0 | - | - | 0 | -/- | |
| 07 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | 4/7 | |
| Symphoricarpos oreophilus | | | | | | | | | | | | | |
| 89 | 66 | - | - | 33 | 33 | - | 50 | 50 | 50 | - | 50 | 15/17 | |
| 97 | 80 | - | - | 80 | - | - | 0 | 0 | 0 | - | 0 | 22/35 | |
| 02 | 100 | - | - | 80 | 20 | - | 20 | 0 | 20 | - | 0 | 16/22 | |
| 07 | 100 | - | 20 | 80 | - | - | 40 | 0 | 0 | - | 0 | 13/17 | |