

Trend Study 17-12-07

Study site name: North Wallsburg Reseeding .

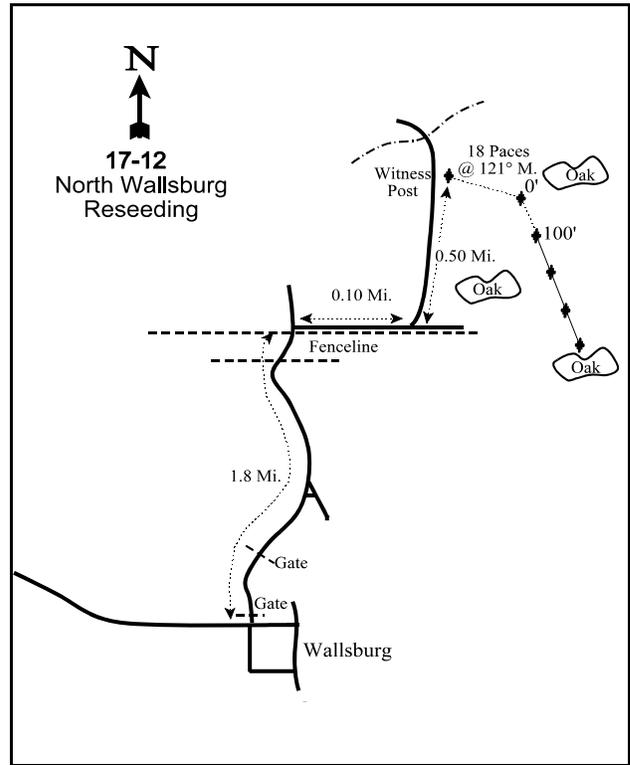
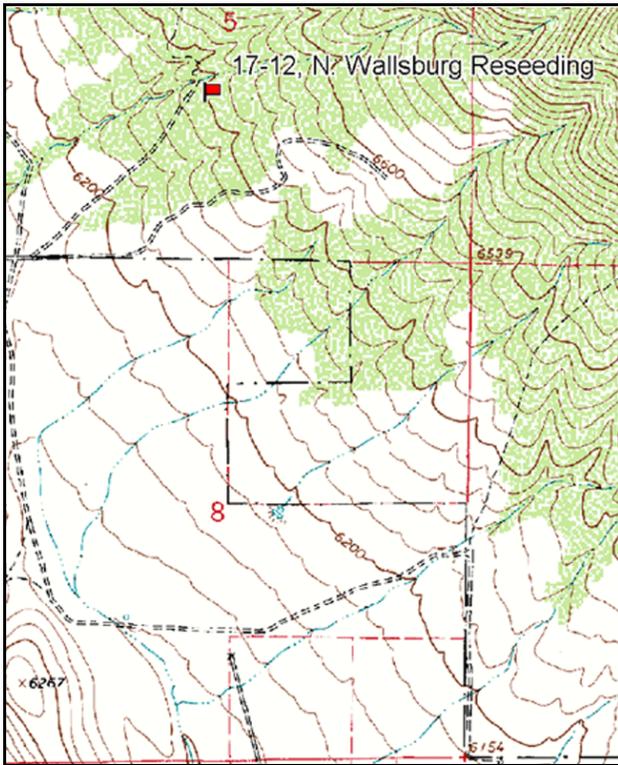
Vegetation type: Mixed Oak - Sage .

Compass bearing: frequency baseline 172 degrees magnetic.

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

LOCATION DESCRIPTION

From the town of Wallsburg, take Center St., going north for 1.8 miles, staying on the main road until coming to a gate. Proceed through the gate and turn east immediately after passing through the gate. Proceed east traveling along the fenceline for 0.10 miles to another intersection. Turn left at the intersection and proceed north for 0.50 miles to a green steel "T" fencepost on the right (i.e., east) side of the road. From the fencepost the 0-foot baseline stake is 18 paces away at an azimuth of 121 degrees magnetic. A red browse tag, number 3953, is attached to the 0-foot baseline stake.



Map Name: Charleston

Diagrammatic Sketch

Township 5S, Range 5E, Section 5

GPS: NAD 83, UTM 12T 465440.0 E 4473635.1 N

## DISCUSSION

### North Wallsburg Seeding - Trend Study No. 17-12

#### Study Information

This study is located on deer and elk winter range northeast of Wallsburg [elevation: 6,400 feet (1,951 m), slope: 10%-15%, aspect: southwest]. The study is within the boundaries of a 1976 wildfire between Main Canyon and Daniels Canyon. The fire varied in intensity, leaving patches of shrubs that survived. The area was seeded later that year. Except for the presence of seeded grasses and forbs, the area is vegetatively similar to adjacent, unburned oak-sagebrush communities. There is a water trough located 40 feet (12 m) southeast of the 400 foot stake. From the pellet group transect, there were an estimated 69 deer days use/acre (170 ddu/ha) in 2002, and 48 deer days use/acre (119 ddu/ha) in 2007. Elk use was estimated at 10 days use/acre (25 edu/ha) in 2002 and 19 days use/acre (46 edu/ha) in 2007. A deer skeleton was found near the 400-foot stake in 2007.

#### Soil

The soil is part of the Yeates Hollow soil series. Soils in this series are deep, well-drained and moderately well-drained, slowly permeable, and formed in alluvium, colluvium and residuum from conglomerate, sandstone and quartzite. Soils are typically up to 46 inches (117 cm) deep (USDA-NRCS 2007). Specifically at the study, the soil texture is a clay loam with a neutral reactivity (pH of 7.1). The soil is moderately deep with many rocks and gravel on the surface and throughout the profile. Litter and vegetation are the dominant cover classes and accounted for 71%-81% of the relative ground cover since 1996. The erosion condition was classified as stable in 2002 and 2007.

#### Browse

Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) canopy cover was 5% in 2002 and 4% in 2007. The density of sagebrush decreased from 1,433 plants/acre (3,547 plants/ha) in 1983 to 320 plants/acre (792 plants/ha) in 2002, and increased to 360 plants/acre (891 plants/ha) in 2007. No seedling plants have been sampled in any given year. The density of young plants decreased in 1989 and 1996, and no young plants have been sampled since. Decadence has been low (0%-14%) except in 2007 (44%). Vigor has been good, and few dead or dying plants have been sampled. The average annual leader growth was 2.0 inches (5.1 cm) in 2002 and 2.2 inches (5.5 cm) in 2007. Browse use has varied from light to moderate-heavy.

Canopy cover of Gambel oak (*Quercus gambelii*) decreased from 11% in 2002 to 8% in 2007. The density has increased every sample year. Gambel oak vigor has been good, except in 2002 when 30% of the stems had poor vigor. The poor vigor was attributed to frost damage. Browse use on oak has varied from light to moderate. The density of antelope bitterbrush (*Purshia tridentata*) has ranged from 80 plants/acre (198 plants/ha) to 100 plants/acre (248 plants/ha). Mature plants have made up the entire population. Plant vigor has been good in all sample years. Annual leader growth averaged 2.2 inches (5.5 cm) in 2002 and 2.6 inches (6.5 cm) in 2007. Browse use was varied from light-moderate to light-heavy.

The populations of stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*) and broom snakeweed (*Gutierrezia sarothrae*) are larger than the sagebrush and bitterbrush populations, though they provide less cover. Rabbitbrush and snakeweed densities have followed a similar pattern of increasing from 1983 to 1989, and then sharply decreasing since 1996. Densities of both peaked at over 7,500 plants/acre (18,565 plants/ha) in 1989. Rabbitbrush decreased to 340 plants/acre (842 plants/ha), and snakeweed decreased to 80 plants/acre (198 plants/ha) in 2007. There have been a few scattered antelope bitterbrush (*Purshia tridentata*) plants since 1996.

#### Herbaceous Understory

Perennial grasses are the dominant component of the community and provided 22% cover in 1996, 19% in

2002, and 31% in 2007. Crested wheatgrass (*Agropyron cristatum*) and intermediate wheatgrass (*Agropyron intermedium*) were the most frequent grasses in 1983 and 1989. In subsequent sample years, sheep fescue (*Festuca ovina*) has been the dominant grass. Bulbous bluegrass (*Poa bulbosa*) has been present since 1996, and cover has increased from 1% in 1996 to 4% in 2007. This perennial grass has a phenology similar to annual grasses (Stewart and Hull 1949). Cheatgrass (*Bromus tectorum*) has also been present, but has accounted for less than 1% cover since 1996.

Forbs have been an insignificant component of the understory. Forb cover has averaged 1% cover since 1996. Alfalfa (*Medicago sativa*) was seeded following the 1976 wildfire, but has only been sampled in low frequencies. Since the sampling of annual species began in 1996, pale alyssum (*Alyssum alyssoides*) has been the most frequently occurring of all forbs.

### 1989 TREND ASSESSMENT

The browse trend is down. The density of mountain big sagebrush decreased 35%. The decrease in the population density was largely from a decrease in the density of young plants. Decadence increased from 0% to 14% of the population, and 4% were classified as dying. Browse use shifted from light to light-moderate. In addition to the changes in sagebrush, there were increases in Gambel oak, stickyleaf low rabbitbrush, and broom snakeweed densities. Browse use on Gambel oak was moderate. The grass trend is up. The sum of nested frequency of perennial grasses increased 66%. Nested frequency increased significantly for crested wheatgrass, intermediate wheatgrass, and sheep fescue. Three perennial species were sampled that had not been sampled in 1983. The forb trend is slightly down. The sum of nested frequency of perennial forbs decreased 59%, but forbs had already existed in low frequencies.

browse - down (-2)

grass - up (+2)

forb - slightly down (-1)

### 1996 TREND ASSESSMENT

The browse trend is stable. The estimated density of sagebrush decreased 64%. Although this decrease seems large, it was attributed to the larger area sampled in 1996. Within the new sample area, young plants comprised 18% of the population, and decadence decreased to 6%. None of the sampled plants had poor vigor, and browse use remained light-moderate. Gambel oak density increased three-fold, and browse use shifted to light-moderate. Antelope bitterbrush was sampled for the first time and had light-moderate browse use. Heavy browsing use was noted on the few true mountain mahogany shrubs scattered throughout the study. The grass trend is slightly down. The sum of nested frequency of perennial grass, excluding bulbous bluegrass, decreased 7%. Bulbous bluegrass was sampled for the first time. Additionally, there were significant decreases in crested wheatgrass and intermediate wheatgrass, and significant increases in sheep fescue and Sandberg bluegrass (*Poa secunda*). The forb trend is slightly up. The sum of nested frequency of perennial forbs increased three-fold, but forbs remained a small component. The Desirable Components Index (DCI) score was fair-good due to the moderate browse cover, low browse decadence, high perennial grass cover, and low perennial forb cover.

winter range condition (DCI) - fair-good (64) Mid-level potential scale

browse - stable (0)

grass - slightly down (-1)

forb - slightly up (+1)

### 2002 TREND ASSESSMENT

The browse trend is stable. The density of sagebrush decreased 6%. There were no young sagebrush plants sampled and decadent plants increased to 13% of the population. Vigor remained constant, but browse use shifted to moderate-heavy. The density of Gambel oak increased 55%. Frost damage was suspected to have caused the proportion of plants with poor vigor to increase from 0% to 30%. Oak did not appear to have been browsed by wildlife in this sample year, and as a result, the increase in oak density did not improve the browse trend. Serviceberry (*Amelanchier alnifolia*) was sampled for the first time, and was present at a low density. The density of bitterbrush decreased 20%. The grass trend is slightly down. Excluding bulbous bluegrass, the

sum of nested frequency of perennial grasses decreased 8%. There was a significant decrease in Sandberg bluegrass and a significant increase in bulbous bluegrass. The forb trend is stable. Even though the sum of nested frequency of perennial forbs decreased 25%, forb frequency was already low. The DCI score remained fair-good.

winter range condition (DCI) - fair-good (65) Mid-level potential scale  
browse - stable (0)                      grass - slightly down (-1)                      forb - stable (0)

**2007 TREND ASSESSMENT**

The browse trend is stable. The density of sagebrush increased 13%. No seedling or young plants were sampled, and decadent plants increased to 44% of the population. The proportion of plants exhibiting poor vigor increased to 11%, and all of these plants were classified as dying. Sagebrush defoliator moths (*Aroga websteri*) had infested 67% of the population. Browse use shifted from moderate-heavy to light-moderate. The density of Gambel oak increased 20% and browse use remained light. The densities of serviceberry and bitterbrush remained stable, and the bitterbrush plants were moderately hedged. The grass trend is stable. Excluding bulbous bluegrass, the sum of nested frequency of perennial grasses increased 11%. There were significant increases in the nested frequencies of bulbous bluegrass and cheatgrass. The forb trend is stable. The sum of nested frequency of perennial forbs increased 19%, but forbs remained a small component of the understory. The DCI score decreased to fair due to a decrease in browse cover and an increase in browse decadence.

winter range condition (DCI) - fair (61) Mid-level potential scale  
browse - stable (0)                      grass - stable (0)                      forb - stable (0)

**HERBACEOUS TRENDS --**  
**Management unit 17 , Study no: 12**

| Type                        | Species               | Nested Frequency |                  |                  |                   |                  | Average Cover % |       |       |
|-----------------------------|-----------------------|------------------|------------------|------------------|-------------------|------------------|-----------------|-------|-------|
|                             |                       | '83              | '89              | '96              | '02               | '07              | '96             | '02   | '07   |
| G                           | Agropyron cristatum   | <sub>a</sub> 90  | <sub>b</sub> 148 | <sub>a</sub> 66  | <sub>a</sub> 56   | <sub>a</sub> 56  | 2.41            | 1.25  | 2.25  |
| G                           | Agropyron intermedium | <sub>a</sub> 117 | <sub>b</sub> 192 | <sub>a</sub> 135 | <sub>ab</sub> 157 | <sub>b</sub> 182 | 3.32            | 5.92  | 7.19  |
| G                           | Bromus tectorum (a)   | -                | -                | <sub>ab</sub> 16 | <sub>a</sub> 7    | <sub>b</sub> 33  | .10             | .53   | .57   |
| G                           | Dactylis glomerata    | <sub>a</sub> 8   | <sub>a</sub> 7   | -                | <sub>a</sub> -    | <sub>a</sub> 3   | -               | .00   | .03   |
| G                           | Festuca ovina         | <sub>a</sub> 42  | <sub>b</sub> 96  | <sub>c</sub> 190 | <sub>c</sub> 171  | <sub>c</sub> 199 | 14.72           | 8.35  | 16.71 |
| G                           | Oryzopsis hymenoides  | <sub>a</sub> 2   | <sub>a</sub> 7   | -                | <sub>a</sub> 4    | -                | -               | .18   | -     |
| G                           | Poa bulbosa           | -                | -                | <sub>a</sub> 32  | <sub>b</sub> 92   | <sub>c</sub> 115 | .62             | 2.79  | 4.23  |
| G                           | Poa fendleriana       | -                | 8                | -                | -                 | -                | -               | -     | -     |
| G                           | Poa pratensis         | <sub>a</sub> 27  | <sub>a</sub> 8   | <sub>a</sub> 26  | <sub>a</sub> 8    | -                | .41             | .04   | -     |
| G                           | Poa secunda           | -                | <sub>a</sub> 3   | <sub>b</sub> 24  | <sub>a</sub> 7    | <sub>a</sub> 8   | .08             | .06   | .09   |
| G                           | Sitanion hystrix      | -                | <sub>a</sub> 6   | <sub>a</sub> 1   | <sub>a</sub> 1    | -                | .00             | .00   | -     |
| G                           | Stipa comata          | -                | -                | -                | <sub>a</sub> 2    | <sub>a</sub> 1   | -               | .03   | .03   |
| Total for Annual Grasses    |                       | 0                | 0                | 16               | 7                 | 33               | 0.10            | 0.53  | 0.56  |
| Total for Perennial Grasses |                       | 286              | 475              | 474              | 498               | 564              | 21.57           | 18.66 | 30.55 |
| Total for Grasses           |                       | 286              | 475              | 490              | 505               | 597              | 21.67           | 19.19 | 31.12 |

| Type                      | Species                            | Nested Frequency |     |      |      |     | Average Cover % |      |      |
|---------------------------|------------------------------------|------------------|-----|------|------|-----|-----------------|------|------|
|                           |                                    | '83              | '89 | '96  | '02  | '07 | '96             | '02  | '07  |
| F                         | <i>Agoseris glauca</i>             | -                | -   | a2   | a1   | a1  | .00             | .00  | .00  |
| F                         | <i>Alyssum alyssoides</i> (a)      | -                | -   | b134 | a22  | b86 | .36             | .08  | .45  |
| F                         | <i>Allium</i> sp.                  | -                | a2  | -    | a2   | a1  | -               | .00  | .00  |
| F                         | <i>Aster chilensis</i>             | -                | -   | -    | -    | 2   | -               | -    | .03  |
| F                         | <i>Astragalus convallarius</i>     | -                | -   | -    | -    | 8   | -               | -    | .09  |
| F                         | <i>Astragalus</i> sp.              | -                | a2  | a1   | a9   | a8  | .03             | .05  | .10  |
| F                         | <i>Astragalus utahensis</i>        | a3               | a1  | a10  | a10  | a5  | .33             | .07  | .16  |
| F                         | <i>Balsamorhiza sagittata</i>      | -                | -   | -    | -    | 1   | -               | -    | .03  |
| F                         | <i>Calochortus nuttallii</i>       | a5               | -   | -    | a2   | a3  | -               | .00  | .01  |
| F                         | <i>Chaenactis douglasii</i>        | -                | a2  | a3   | -    | -   | .03             | -    | -    |
| F                         | <i>Cirsium</i> sp.                 | a2               | -   | a6   | -    | a4  | .26             | -    | .01  |
| F                         | <i>Collomia linearis</i> (a)       | -                | -   | -    | a5   | a1  | -               | .01  | .00  |
| F                         | <i>Comandra pallida</i>            | -                | -   | -    | 3    | -   | -               | .00  | -    |
| F                         | <i>Descurainia pinnata</i> (a)     | -                | -   | -    | a4   | a8  | -               | .01  | .02  |
| F                         | <i>Draba</i> sp. (a)               | -                | -   | -    | -    | 19  | -               | -    | .11  |
| F                         | <i>Epilobium brachycarpum</i> (a)  | -                | -   | 3    | -    | -   | .00             | -    | -    |
| F                         | <i>Erigeron</i> sp.                | -                | -   | 1    | -    | -   | .03             | -    | -    |
| F                         | <i>Eriogonum racemosum</i>         | -                | -   | a7   | a3   | a6  | .05             | .04  | .03  |
| F                         | <i>Grindelia squarrosa</i>         | -                | -   | a3   | a5   | -   | .06             | .01  | -    |
| F                         | <i>Lactuca serriola</i>            | 8                | -   | -    | -    | -   | -               | -    | -    |
| F                         | <i>Linum lewisii</i>               | -                | -   | a3   | a1   | a1  | .00             | .03  | .00  |
| F                         | <i>Lithospermum ruderales</i>      | -                | -   | a1   | b11  | a2  | .15             | .13  | .19  |
| F                         | <i>Medicago sativa</i>             | a3               | a1  | a10  | a4   | a2  | .33             | .21  | .30  |
| F                         | <i>Orthocarpus</i> sp. (a)         | -                | -   | 2    | -    | -   | .00             | -    | -    |
| F                         | <i>Phlox longifolia</i>            | -                | a2  | b23  | ab11 | b29 | .06             | .03  | .14  |
| F                         | <i>Polygonum douglasii</i> (a)     | -                | -   | a5   | -    | a1  | .01             | -    | .00  |
| F                         | <i>Ranunculus testiculatus</i> (a) | -                | -   | -    | -    | 3   | -               | -    | .00  |
| F                         | <i>Sphaeralcea coccinea</i>        | a3               | a3  | -    | a1   | a2  | -               | .00  | .00  |
| F                         | <i>Tragopogon dubius</i>           | b28              | a7  | a8   | a2   | a1  | .01             | .01  | .00  |
| F                         | <i>Viguiera multiflora</i>         | b11              | ab7 | ab9  | -    | a1  | .19             | -    | .00  |
| F                         | <i>Zigadenus paniculatus</i>       | 2                | -   | -    | -    | -   | -               | -    | -    |
| Total for Annual Forbs    |                                    | 0                | 0   | 144  | 31   | 118 | 0.37            | 0.09 | 0.59 |
| Total for Perennial Forbs |                                    | 65               | 27  | 87   | 65   | 77  | 1.55            | 0.62 | 1.13 |
| Total for Forbs           |                                    | 65               | 27  | 231  | 96   | 195 | 1.93            | 0.72 | 1.73 |

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

BROWSE TRENDS --

Management unit 17 , Study no: 12

| Type             | Species                                      | Strip Frequency |     |     | Average Cover % |       |      |
|------------------|----------------------------------------------|-----------------|-----|-----|-----------------|-------|------|
|                  |                                              | '96             | '02 | '07 | '96             | '02   | '07  |
| B                | Amelanchier alnifolia                        | 0               | 2   | 2   | -               | .41   | .18  |
| B                | Artemisia tridentata vaseyana                | 12              | 11  | 12  | 1.62            | 3.91  | 3.24 |
| B                | Cercocarpus montanus                         | 1               | 0   | 0   | .03             | -     | -    |
| B                | Chrysothamnus viscidiflorus<br>viscidiflorus | 35              | 13  | 10  | .72             | .04   | .06  |
| B                | Gutierrezia sarothrae                        | 21              | 4   | 4   | .47             | .03   | .03  |
| B                | Opuntia sp.                                  | 6               | 4   | 4   | .03             | -     | -    |
| B                | Purshia tridentata                           | 5               | 4   | 4   | 1.59            | 1.69  | 1.95 |
| B                | Quercus gambelii                             | 26              | 25  | 26  | 5.13            | 6.09  | 3.73 |
| B                | Symphoricarpos oreophilus                    | 1               | 0   | 0   | .15             | -     | -    |
| B                | Tetradymia canescens                         | 7               | 8   | 7   | .06             | .51   | .48  |
| Total for Browse |                                              | 114             | 71  | 69  | 9.81            | 12.69 | 9.69 |

CANOPY COVER, LINE INTERCEPT --

Management unit 17 , Study no: 12

| Species                                      | Percent Cover |      |
|----------------------------------------------|---------------|------|
|                                              | '02           | '07  |
| Amelanchier alnifolia                        | .26           | .13  |
| Artemisia tridentata vaseyana                | 4.56          | 4.28 |
| Chrysothamnus viscidiflorus<br>viscidiflorus | .25           | .91  |
| Gutierrezia sarothrae                        | -             | .05  |
| Opuntia sp.                                  | .01           | .01  |
| Purshia tridentata                           | 2.06          | 1.98 |
| Quercus gambelii                             | 11.25         | 7.91 |
| Tetradymia canescens                         | .78           | .81  |

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 17 , Study no: 12

| Species                       | Average leader growth (in) |     |
|-------------------------------|----------------------------|-----|
|                               | '02                        | '07 |
| Artemisia tridentata vaseyana | 2.0                        | 2.1 |
| Purshia tridentata            | 2.2                        | 2.6 |

**BASIC COVER --**

Management unit 17 , Study no: 12

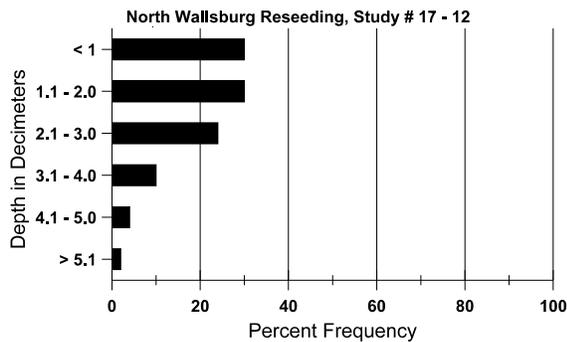
| Cover Type  | Average Cover % |       |       |       |       |
|-------------|-----------------|-------|-------|-------|-------|
|             | '83             | '89   | '96   | '02   | '07   |
| Vegetation  | 1.50            | 4.25  | 35.09 | 33.00 | 48.28 |
| Rock        | 5.75            | 5.50  | 6.78  | 5.06  | 3.71  |
| Pavement    | 6.25            | 10.75 | 10.14 | 4.41  | 2.83  |
| Litter      | 65.00           | 59.75 | 40.23 | 58.65 | 42.93 |
| Cryptogams  | 1.50            | .25   | .81   | .06   | .10   |
| Bare Ground | 20.00           | 19.50 | 12.07 | 20.63 | 14.95 |

**SOIL ANALYSIS DATA --**

Herd Unit 17, Study no: 12, North Wallsburg Reseeding

| Effective rooting depth (in) | Temp °F (depth) | pH  | Clay loam |       |       | %OM | ppm P | ppm K | dS/m |
|------------------------------|-----------------|-----|-----------|-------|-------|-----|-------|-------|------|
|                              |                 |     | %sand     | %silt | %clay |     |       |       |      |
| 11.5                         | 46.2 (14.8)     | 7.1 | 40.2      | 29.1  | 30.7  | 3.5 | 21.1  | 163.2 | .7   |

**Stoniness Index**



**PELLET GROUP DATA --**

Management unit 17 , Study no: 12

| Type   | Quadrat Frequency |     |     |
|--------|-------------------|-----|-----|
|        | '96               | '02 | '07 |
| Rabbit | 8                 | -   | 17  |
| Elk    | 5                 | 5   | 6   |
| Deer   | 27                | 24  | 31  |
| Cattle | 5                 | -   | -   |

| Days use per acre (ha) |          |
|------------------------|----------|
| '02                    | '07      |
| -                      | -        |
| 10 (25)                | 19 (46)  |
| 69 (170)               | 48 (119) |
| -                      | -        |

BROWSE CHARACTERISTICS --  
Management unit 17 , Study no: 12

|                                                  |                                       | 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) |
| <b>Amelanchier alnifolia</b>                     |                                       |                                          |       |        |          |      |             |         |            |         |              |                           |
| 83                                               | <b>0</b>                              | -                                        | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| 89                                               | <b>0</b>                              | -                                        | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| 96                                               | <b>0</b>                              | -                                        | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| 02                                               | <b>40</b>                             | -                                        | -     | 40     | -        | -    | 50          | 50      | -          | -       | 0            | 31/35                     |
| 07                                               | <b>40</b>                             | -                                        | -     | 40     | -        | -    | 50          | 0       | -          | -       | 0            | 27/35                     |
| <b>Artemisia tridentata vaseyana</b>             |                                       |                                          |       |        |          |      |             |         |            |         |              |                           |
| 83                                               | <b>1433</b>                           | -                                        | 1200  | 233    | -        | -    | 0           | 0       | 0          | -       | 0            | 26/30                     |
| 89                                               | <b>932</b>                            | -                                        | 633   | 166    | 133      | -    | 39          | 0       | 14         | 4       | 4            | 28/36                     |
| 96                                               | <b>340</b>                            | -                                        | 60    | 260    | 20       | 40   | 53          | 6       | 6          | -       | 0            | 28/47                     |
| 02                                               | <b>320</b>                            | -                                        | -     | 280    | 40       | 40   | 44          | 56      | 13         | -       | 0            | 27/40                     |
| 07                                               | <b>360</b>                            | -                                        | -     | 200    | 160      | 20   | 39          | 6       | 44         | 11      | 11           | 30/49                     |
| <b>Cercocarpus montanus</b>                      |                                       |                                          |       |        |          |      |             |         |            |         |              |                           |
| 83                                               | <b>0</b>                              | -                                        | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| 89                                               | <b>0</b>                              | -                                        | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| 96                                               | <b>20</b>                             | -                                        | -     | 20     | -        | -    | 0           | 100     | -          | -       | 0            | 32/38                     |
| 02                                               | <b>0</b>                              | -                                        | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | 27/35                     |
| 07                                               | <b>0</b>                              | -                                        | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| <b>Chrysothamnus viscidiflorus viscidiflorus</b> |                                       |                                          |       |        |          |      |             |         |            |         |              |                           |
| 83                                               | <b>5333</b>                           | -                                        | 433   | 4900   | -        | -    | 0           | 0       | 0          | -       | 0            | 8/7                       |
| 89                                               | <b>7766</b>                           | 33                                       | 233   | 6933   | 600      | -    | 0           | 0       | 8          | -       | 18           | 10/13                     |
| 96                                               | <b>1300</b>                           | 60                                       | 200   | 1020   | 80       | 60   | 0           | 0       | 6          | 2       | 2            | 11/20                     |
| 02                                               | <b>480</b>                            | -                                        | 20    | 440    | 20       | 20   | 0           | 0       | 4          | 4       | 4            | 7/13                      |
| 07                                               | <b>340</b>                            | -                                        | -     | 260    | 80       | -    | 0           | 0       | 24         | 6       | 6            | 9/13                      |
| <b>Gutierrezia sarothrae</b>                     |                                       |                                          |       |        |          |      |             |         |            |         |              |                           |
| 83                                               | <b>4933</b>                           | -                                        | 833   | 4100   | -        | -    | 0           | 0       | 0          | -       | 0            | 8/9                       |
| 89                                               | <b>7533</b>                           | -                                        | 100   | 7300   | 133      | -    | 0           | 0       | 2          | -       | 15           | 9/9                       |
| 96                                               | <b>840</b>                            | 20                                       | 280   | 560    | -        | -    | 0           | 0       | 0          | -       | 0            | 8/10                      |
| 02                                               | <b>120</b>                            | -                                        | -     | 100    | 20       | -    | 0           | 0       | 17         | -       | 0            | 7/9                       |
| 07                                               | <b>80</b>                             | -                                        | -     | 60     | 20       | -    | 0           | 0       | 25         | 25      | 25           | 9/12                      |

|                                  |                                       | 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) |
| <b>Opuntia sp.</b>               |                                       |                                          |       |        |          |      |             |         |            |         |              |                           |
| 83                               | <b>266</b>                            | -                                        | -     | 266    | -        | -    | 0           | 0       | 0          | -       | 0            | 6/8                       |
| 89                               | <b>200</b>                            | -                                        | -     | 200    | -        | -    | 0           | 0       | 0          | -       | 33           | 6/18                      |
| 96                               | <b>160</b>                            | -                                        | -     | 160    | -        | -    | 0           | 13      | 0          | -       | 0            | 5/23                      |
| 02                               | <b>80</b>                             | -                                        | -     | 80     | -        | -    | 0           | 0       | 0          | -       | 0            | 5/8                       |
| 07                               | <b>80</b>                             | -                                        | -     | 60     | 20       | -    | 0           | 0       | 25         | -       | 0            | 5/11                      |
| <b>Purshia tridentata</b>        |                                       |                                          |       |        |          |      |             |         |            |         |              |                           |
| 83                               | <b>0</b>                              | -                                        | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| 89                               | <b>0</b>                              | -                                        | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| 96                               | <b>100</b>                            | -                                        | -     | 100    | -        | -    | 40          | 0       | -          | -       | 0            | 31/78                     |
| 02                               | <b>80</b>                             | -                                        | -     | 80     | -        | -    | 0           | 50      | -          | -       | 0            | 36/77                     |
| 07                               | <b>80</b>                             | -                                        | -     | 80     | -        | -    | 75          | 0       | -          | -       | 0            | 41/80                     |
| <b>Quercus gambelii</b>          |                                       |                                          |       |        |          |      |             |         |            |         |              |                           |
| 83                               | <b>666</b>                            | -                                        | -     | 666    | -        | -    | 0           | 0       | 0          | -       | 0            | 53/34                     |
| 89                               | <b>899</b>                            | 133                                      | 433   | 466    | -        | -    | 93          | 7       | 0          | -       | 0            | 89/37                     |
| 96                               | <b>2840</b>                           | 240                                      | 560   | 2100   | 180      | 240  | 51          | 4       | 6          | -       | .70          | 50/32                     |
| 02                               | <b>4400</b>                           | -                                        | 1160  | 3140   | 100      | 440  | 0           | 0       | 2          | 2       | 30           | 47/26                     |
| 07                               | <b>5320</b>                           | -                                        | 2400  | 2120   | 800      | 1540 | 3           | 0       | 15         | .75     | 11           | 81/48                     |
| <b>Symphoricarpos oreophilus</b> |                                       |                                          |       |        |          |      |             |         |            |         |              |                           |
| 83                               | <b>0</b>                              | -                                        | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| 89                               | <b>0</b>                              | -                                        | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| 96                               | <b>20</b>                             | -                                        | -     | 20     | -        | -    | 0           | 0       | -          | -       | 0            | 35/35                     |
| 02                               | <b>0</b>                              | -                                        | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | 24/48                     |
| 07                               | <b>0</b>                              | -                                        | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | 41/74                     |
| <b>Tetradymia canescens</b>      |                                       |                                          |       |        |          |      |             |         |            |         |              |                           |
| 83                               | <b>0</b>                              | -                                        | -     | -      | -        | -    | 0           | 0       | 0          | -       | 0            | -/-                       |
| 89                               | <b>0</b>                              | -                                        | -     | -      | -        | -    | 0           | 0       | 0          | -       | 0            | -/-                       |
| 96                               | <b>400</b>                            | -                                        | 80    | 320    | -        | -    | 0           | 0       | 0          | -       | 0            | 9/15                      |
| 02                               | <b>640</b>                            | -                                        | 100   | 540    | -        | -    | 0           | 0       | 0          | -       | 0            | 9/22                      |
| 07                               | <b>680</b>                            | -                                        | 60    | 580    | 40       | -    | 0           | 0       | 6          | -       | 26           | 9/17                      |