

Trend Study 20-3-08

Study site name: Mountain Home Seeding.

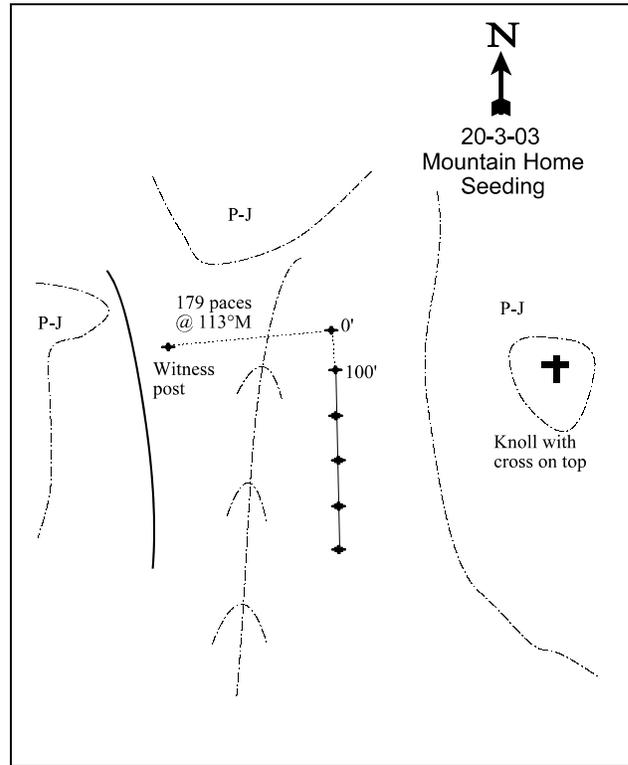
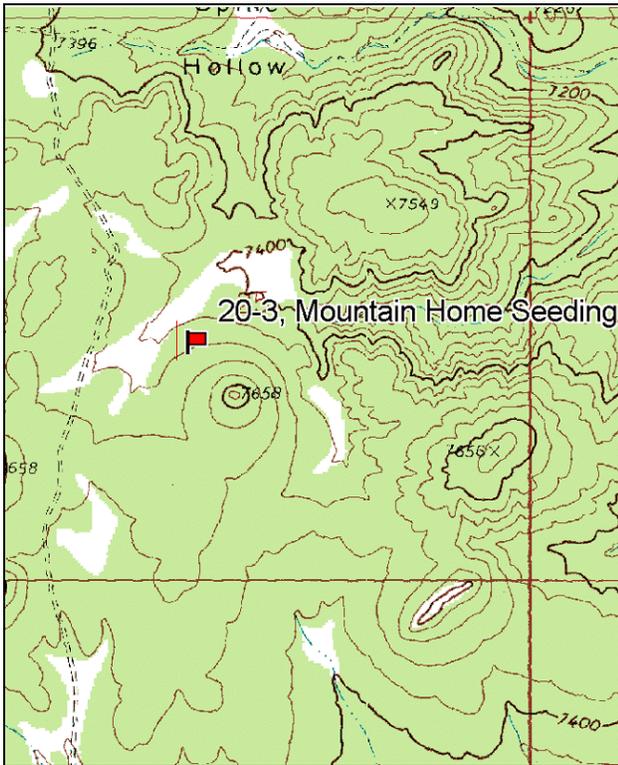
Vegetation type: Burn.

Compass bearing: frequency baseline 180 degrees magnetic.

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

LOCATION DESCRIPTION

From the Indian Peaks cabin drive to the main Pine Valley Road. Turn left (north) and drive about 2.0 miles to a fork which is labeled with a sign saying “Hamblin Valley Road 15 miles.” Drive west on this road avoiding side roads about 12.0 miles to a four-way intersection. The sign reads “Lopers Spring 6.0 miles” to the north. Turn right (north) and drive 6.2 miles to a witness post on the right side of the road. (You will pass another 4 way intersection at about 3.7 miles.) The 0-foot stake is 170 paces from the witness post at 113 degrees magnetic. The 0-foot stake is marked with browse tag #143.



Map Name: Lopers Spring

Diagrammatic Sketch

Township 27S, Range 19W, Section 25

GPS: NAD 83, UTM 12S 244818 E, 4257570 N

## DISCUSSION

### Mountain Home Seeding - Trend Study No. 20-3

#### Study Information

This study was established in 1998 on a pinyon-juniper treatment area [elevation: 7,480 feet (2,280 m), slope: 5%, aspect: northwest]. In 1989, 1,200 acres of pinyon-juniper woodland were chained, hand-cut, burned, and aerially seeded to benefit big game and wild horses. Although the project improved the habitat, heavy wildlife use and drought conditions diminished grass and forage production. Singleleaf pinyon pine (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*), as well as several species of rabbitbrush (*Chrysothamnus spp.*), had encroached on the treatment area. In fall 2005, the pinyon, juniper, and rabbitbrush were manually and mechanically removed, and the treatment area was reseeded. The area is used heavily by wild horses and moderately by elk and deer throughout most of the year. Escape and thermal cover are available at the edge of the treatment about 200 feet east of the study site. Pellet group transect data estimated horse use at 44 days use/acre (107 hdu/ha) in 1998, 38 days use/acre (95 hdu/ha) in 2003, and 44 days use/acre (107 hdu/ha) in 2008. Elk use was estimated at 27 days use/acre (67 edu/ha) in 1998, 40 days use/acre (98 edu/ha) in 2003, and 52 days use/acre (127 edu/ha) in 2008. Deer use was estimated at 7 days use/acre (17 ddu/ha) in 1998, 3 days use/acre (7 ddu/ha) in 2003, and 5 days use/acre (12 ddu/ha) in 2008. Cattle use was estimated at 1 day use/acre (2 cdu/ha) in 2003.

#### Soil

The soil is a sandy loam with a slightly acidic reaction (pH 6.3). Relative combined vegetation and litter cover was 59% in 1998, 28% in 2003, and 39% in 2008. Relative combined rock and pavement cover steadily increased from 28% in 1998 to 48% in 2008. Relative bare ground cover increased from 12% in 1998 to 39% in 2003, then decreased to 13% by 2008. The soil erosion condition was classified as stable in 2003 and 2008.

#### Browse

The browse component consists of mostly graystem rabbitbrush (*Chrysothamnus nauseosus* ssp. *hololeucus*), rubber rabbitbrush (*Chrysothamnus nauseosus*), and mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). Sagebrush was not sampled in 1998 and provided less than 1% quadrat cover in 2003 and 2008. Density was 20 plants/acre in 2003 and 1,340 plants/acre in 2008. The sagebrush sampled in 2003 was mature, and by 2008, 70% of the sampled plants were young and 30% were mature. Sagebrush seedlings were also sampled in 2008 at a density of 80 plants/acre. Browse use was heavy in 2003 and mostly light in 2008, and vigor was good both years.

Graystem rabbitbrush quadrat cover steadily increased from less than 1% in 1998 to 2% in 2008. It was not sampled in the density strips in 1998, and density increased to 40 plants/acre in 2003 and 3,500 plants/acre in 2008. The population has been mostly mature, with 9% decadence in 2008. Vigor was good on most plants in all sample years. Browse use was light-moderate in 2003 and 2008.

Rubber rabbitbrush was first sampled in 2003. Quadrat cover increased from almost 0% in 2003 to 1% in 2008, and density increased from 40 plants/acre to 1,760 plants/acre. Only seedlings were sampled in 2003, but by 2008, over 80% of the plants were mature. Vigor was good on most plants in all sample years. Browse use was light in 2003 and light-moderate in 2008.

#### Herbaceous Understory

Total grass cover was 30% in 1998, 9% in 2003, and 13% in 2008. The treatment area was seeded with seven grass species (Table 1), however, crested wheatgrass (*Agropyron cristatum*) was the only seeded species sampled. It was the dominant species on the study, providing 83%-91% of the total grass cover and 64%-81% of the total vegetative cover since 1998. Other perennial grasses sampled included smooth brome (*Bromus inermis*), intermediate wheatgrass (*Agropyron intermedium*), purple three-awn (*Aristida purpurea*), and

bottlebrush squirreltail (*Sitanion hystrix*). Cheatgrass (*Bromus tectorum*) was sampled each year, but provided little cover. Quadrat frequency steadily decreased from 27% in 1998 to 3% in 2008.

Forbs were sparse and provided less than 1% cover in all sample years. The majority of the forb cover was provided by perennials. Six forb species were seeded (Table 1), and four of these were sampled, including blue flax (*Linum lewisii*), alfalfa (*Medicago sativa*), small burnet (*Sanguisorba minor*), and milkvetch (*Astragalus sp.*). Other forbs sampled each year included thorn skeleton plant (*Lygodesmia spinosa*), longleaf phlox (*Phlox longifolia*), spring parsley (*Cymopterus sp.*), and scarlet globemallow (*Sphaeralcea coccinea*).

#### 1998 Desirable Components Index

The 1998 winter range condition, determined by the Desirable Components Index (DCI), was rated as very poor due to the lack of preferred browse cover and very low perennial forb cover, despite high perennial grass cover.

winter range condition (DCI) - very poor (30) Mid-level potential scale

#### 2003 Trend Assessment

The browse trend is stable. Mountain big sagebrush was sampled for the first time at a very low density, and the other browse species present provided little forage value. The grass trend is slightly down. The sum of nested frequency for perennial grasses decreased 18%. Crested wheatgrass and smooth brome decreased significantly in nested frequency. However, cheatgrass nested frequency also decreased significantly. The trend for forbs is slightly down. The sum of nested frequency for perennial forbs decreased almost 70%. Spring parsley and alfalfa decreased significantly in nested frequency. The number of perennial forb species sampled decreased from seven to four. The 2003 DCI remained very poor with decreased perennial grass cover.

winter range condition (DCI) - very poor (19) Mid-level potential scale

browse - stable (0)

grass - slightly down (-1)

forb - slightly down (-1)

#### 2008 Trend Assessment

The browse trend is slightly up. Mountain big sagebrush density increased substantially, and 70% of the population was young plants. However, graystem rabbitbrush and rubber rabbitbrush, which are not as useful for big game, also increased in density. The trend for grass is slightly up. The sum of nested frequency for perennial grasses increased 19%. Intermediate wheatgrass increased significantly in nested frequency, while cheatgrass nested frequency continued to decrease significantly. The trend for forbs is slightly up. The sum of nested frequency for perennial forbs increased substantially. The number of perennial forb species sampled increased from four to 11. The DCI rating remained very poor despite an increase in perennial grass cover.

winter range condition (DCI) - very poor (27) Mid-level potential scale

browse - slightly up (+1)

grass - slightly up (+1)

forb - slightly up (+1)

**Table 1.** Seed mix applied to Mountain Home Seeding in 2005.

| Seed Species                   | Pounds in Percent of |     |
|--------------------------------|----------------------|-----|
|                                | Mix                  | Mix |
| Crested Wheatgrass 'Douglas'   | 600                  | 5   |
| Crested Wheatgrass 'Hycrest'   | 600                  | 5   |
| Pubescent Wheatgrass           | 1221                 | 10  |
| Snake River Wheatgrass 'Secar' | 1200                 | 10  |
| Indian Ricegrass               | 1200                 | 10  |
| Sandberg Bluegrass 'SID OR'    | 600                  | 5   |
| Hard Fescue 'Durar'            | 600                  | 5   |
| Canby Bluegrass 'Canbar'       | 600                  | 5   |
| Blue Flax 'Appar'              | 60                   | 1   |
| Yellow Sweetclover             | 400                  | 3   |
| Alfalfa 'Ladak+'               | 400                  | 3   |
| Alfalfa 'Nomad'                | 400                  | 3   |
| Alfalfa 'Spredor 4'            | 400                  | 3   |
| Small Burnet 'Delar'           | 1200                 | 10  |
| Cicer Milkvetch 'Lutana'       | 1188                 | 10  |
| Sainfoin 'Eski'                | 1800                 | 14  |
| <b>Total</b>                   | <b>12,469</b>        |     |

HERBACEOUS TRENDS --

Management unit 20 , Study no: 3

| Type                               | Species                    | Nested Frequency |                  |                   | Average Cover % |             |              |
|------------------------------------|----------------------------|------------------|------------------|-------------------|-----------------|-------------|--------------|
|                                    |                            | '98              | '03              | '08               | '98             | '03         | '08          |
|                                    |                            |                  |                  |                   |                 |             |              |
| G                                  | Agropyron cristatum        | <sub>b</sub> 352 | <sub>a</sub> 318 | <sub>ab</sub> 337 | 25.30           | 8.56        | 10.92        |
| G                                  | Agropyron intermedium      | <sub>a</sub> 34  | <sub>a</sub> 18  | <sub>b</sub> 57   | .90             | .08         | .39          |
| G                                  | Aristida purpurea          | 5                | -                | 4                 | .15             | -           | .01          |
| G                                  | Bromus inermis             | <sub>b</sub> 115 | <sub>a</sub> 82  | <sub>ab</sub> 92  | 3.25            | .67         | 1.80         |
| G                                  | Bromus tectorum (a)        | <sub>c</sub> 84  | <sub>b</sub> 29  | <sub>a</sub> 6    | .65             | .12         | .01          |
| G                                  | Sitanion hystrix           | 3                | -                | 7                 | .03             | -           | .01          |
| <b>Total for Annual Grasses</b>    |                            | <b>84</b>        | <b>29</b>        | <b>6</b>          | <b>0.64</b>     | <b>0.12</b> | <b>0.01</b>  |
| <b>Total for Perennial Grasses</b> |                            | <b>509</b>       | <b>418</b>       | <b>497</b>        | <b>29.64</b>    | <b>9.32</b> | <b>13.14</b> |
| <b>Total for Grasses</b>           |                            | <b>593</b>       | <b>447</b>       | <b>503</b>        | <b>30.29</b>    | <b>9.44</b> | <b>13.15</b> |
| F                                  | Astragalus sp.             | 1                | -                | 3                 | .00             | -           | .00          |
| F                                  | Collinsia parviflora (a)   | <sub>b</sub> 11  | <sub>a</sub> -   | <sub>a</sub> 1    | .03             | -           | .00          |
| F                                  | Cymopterus sp.             | <sub>b</sub> 34  | <sub>a</sub> 2   | <sub>a</sub> 6    | .11             | .00         | .04          |
| F                                  | Dalea sp.                  | -                | -                | 3                 | -               | -           | .00          |
| F                                  | Descurainia pinnata (a)    | 2                | -                | -                 | .03             | -           | -            |
| F                                  | Gayophytum ramosissimum(a) | -                | -                | 3                 | -               | -           | .00          |
| F                                  | Gilia sp. (a)              | <sub>b</sub> 25  | <sub>a</sub> -   | <sub>a</sub> -    | .08             | -           | -            |
| F                                  | Grindelia squarrosa        | -                | -                | 1                 | -               | -           | .01          |
| F                                  | Halogeton glomeratus (a)   | -                | 2                | -                 | -               | .00         | -            |

| T<br>y<br>p<br>e          | Species                         | Nested Frequency |                 |                 | Average Cover % |      |      |
|---------------------------|---------------------------------|------------------|-----------------|-----------------|-----------------|------|------|
|                           |                                 | '98              | '03             | '08             | '98             | '03  | '08  |
| F                         | <i>Lappula occidentalis</i> (a) | 5                | -               | -               | .01             | -    | -    |
| F                         | <i>Linum lewisii</i>            | -                | -               | 1               | -               | -    | .00  |
| F                         | <i>Lupinus argenteus</i>        | 3                | -               | 4               | .00             | -    | .03  |
| F                         | <i>Lygodesmia spinosa</i>       | 1                | 5               | 3               | .03             | .15  | .15  |
| F                         | <i>Medicago sativa</i>          | <sub>b</sub> 7   | <sub>a</sub> 1  | <sub>a</sub> -  | .22             | .03  | -    |
| F                         | <i>Microsteris gracilis</i> (a) | <sub>b</sub> 24  | <sub>a</sub> -  | <sub>a</sub> 1  | .05             | -    | .00  |
| F                         | <i>Phlox longifolia</i>         | <sub>a</sub> 1   | <sub>ab</sub> 7 | <sub>b</sub> 12 | .00             | .02  | .04  |
| F                         | <i>Sanguisorba minor</i>        | -                | -               | 3               | -               | -    | .01  |
| F                         | <i>Senecio multilobatus</i>     | -                | -               | 2               | -               | -    | .00  |
| F                         | <i>Sphaeralcea coccinea</i>     | 2                | -               | 3               | .03             | .00  | .06  |
| Total for Annual Forbs    |                                 | 67               | 2               | 5               | 0.21            | 0.00 | 0.01 |
| Total for Perennial Forbs |                                 | 49               | 15              | 41              | 0.41            | 0.21 | 0.36 |
| Total for Forbs           |                                 | 116              | 17              | 46              | 0.62            | 0.21 | 0.38 |

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

#### BROWSE TRENDS --

Management unit 20 , Study no: 3

| T<br>y<br>p<br>e | Species  | Strip Frequency |     |     | Average Cover % |      |      |
|------------------|--|-----------------|-----|-----|-----------------|------|------|
|                  |  | '98             | '03 | '08 | '98             | '03  | '08  |
| B                | <i>Artemisia tridentata vaseyana</i>             | 0               | 1   | 28  | -               | .00  | .27  |
| B                | <i>Chrysothamnus nauseosus</i>                   | 0               | 0   | 41  | -               | .03  | 1.00 |
| B                | <i>Chrysothamnus nauseosus hololeucus</i>        | 0               | 2   | 62  | .38             | 1.00 | 2.39 |
| B                | <i>Chrysothamnus parryi</i>                      | 0               | 1   | 0   | -               | .00  | -    |
| B                | <i>Chrysothamnus viscidiflorus viscidiflorus</i> | 0               | 0   | 1   | -               | -    | .00  |
| B                | <i>Gutierrezia sarothrae</i>                     | 0               | 1   | 0   | -               | .00  | -    |
| Total for Browse |  | 0               | 5   | 132 | 0.37            | 1.03 | 3.66 |

CANOPY COVER, LINE INTERCEPT --  
 Management unit 20 , Study no: 3

| Species                            | Percent Cover |      |
|------------------------------------|---------------|------|
|                                    | '03           | '08  |
| Artemisia tridentata vaseyana      | .28           | .95  |
| Chrysothamnus nauseosus            | .53           | 1.38 |
| Chrysothamnus nauseosus hololeucus | -             | 2.40 |

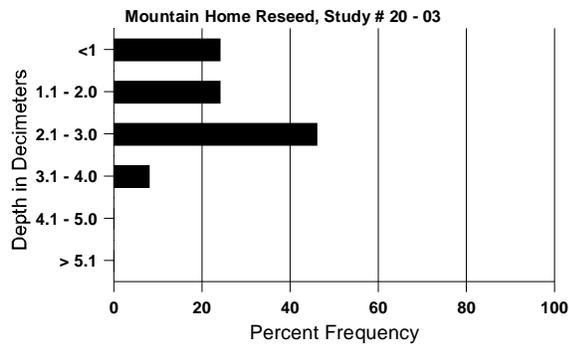
BASIC COVER --  
 Management unit 20 , Study no: 3

| Cover Type  | Average Cover % |       |       |
|-------------|-----------------|-------|-------|
|             | '98             | '03   | '08   |
| Vegetation  | 35.65           | 10.62 | 17.22 |
| Rock        | 13.67           | 11.80 | 16.79 |
| Pavement    | 23.51           | 24.60 | 36.04 |
| Litter      | 42.54           | 18.95 | 25.23 |
| Cryptogams  | .04             | 0     | .15   |
| Bare Ground | 15.58           | 41.51 | 13.88 |

SOIL ANALYSIS DATA --  
 Management unit 20, Study no: 3, Study Name: Mountain Home Reseed

| Effective rooting depth (in) | Temp °F (depth) | pH  | Sandy Loam |       |       | %OM | PPM P | PPM K | ds/m |
|------------------------------|-----------------|-----|------------|-------|-------|-----|-------|-------|------|
|                              |                 |     | %sand      | %silt | %clay |     |       |       |      |
| 12.2                         | 65.0<br>(13.8)  | 6.3 | 70.0       | 15.1  | 14.9  | 2.1 | 21.5  | 163.2 | 0.6  |

### Stoniness Index



PELLET GROUP DATA --

Management unit 20 , Study no: 3

| Type   | Quadrat Frequency |     |     |
|--------|-------------------|-----|-----|
|        | '98               | '03 | '08 |
| Rabbit | 5                 | -   | 53  |
| Horse  | 30                | 27  | 20  |
| Elk    | 27                | 16  | 31  |
| Deer   | 14                | 7   | 9   |
| Cattle | -                 | 1   | -   |

| Days use per acre (ha) |         |          |
|------------------------|---------|----------|
| '98                    | '03     | '08      |
| -                      | -       | -        |
| 44 (109)               | 38 (95) | 44 (107) |
| 16 (40)                | 39 (98) | 52 (127) |
| 7 (17)                 | 3 (7)   | 5 (12)   |
| -                      | 1 (2)   | -        |

BROWSE CHARACTERISTICS --

Management unit 20 , Study no: 3

|  |                                       | 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) |
|  |                                       |  |       |        |          |      |             |         |            |         |              |                           |
| 98   | 0                                     | -  | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| 03   | 0                                     | -  | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | 9/21                      |
| 08   | 0                                     | -  | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| <i>Artemisia tridentata vaseyana</i>             |                                       |  |       |        |          |      |             |         |            |         |              |                           |
| 98   | 0                                     | -  | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | 30/40                     |
| 03   | 20                                    | -  | -     | 20     | -        | -    | 0           | 100     | -          | -       | 0            | 30/48                     |
| 08   | 1340                                  | 80                                       | 940   | 400    | -        | 20   | 3           | 3       | -          | -       | 0            | 11/13                     |
| <i>Chrysothamnus nauseosus</i>                   |                                       |  |       |        |          |      |             |         |            |         |              |                           |
| 98   | 0                                     | -  | -     | -      | -        | -    | 0           | 0       | 0          | -       | 0            | -/-                       |
| 03   | 0                                     | 40                                       | -     | -      | -        | -    | 0           | 0       | 0          | -       | 0            | 42/61                     |
| 08   | 1760                                  | 20                                       | 160   | 1440   | 160      | 20   | 22          | 0       | 9          | -       | 3            | 14/17                     |
| <i>Chrysothamnus nauseosus hololeucus</i>        |                                       |  |       |        |          |      |             |         |            |         |              |                           |
| 98   | 0                                     | -  | -     | -      | -        | -    | 0           | 0       | 0          | -       | 0            | 35/48                     |
| 03   | 40                                    | -  | -     | 40     | -        | -    | 50          | 0       | 0          | -       | 0            | 33/49                     |
| 08   | 3500                                  | 20                                       | 540   | 2640   | 320      | -    | 21          | 2       | 9          | 3       | 7            | 12/17                     |
| <i>Chrysothamnus parryi</i>                      |                                       |  |       |        |          |      |             |         |            |         |              |                           |
| 98   | 0                                     | -  | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| 03   | 20                                    | -  | -     | 20     | -        | -    | 0           | 0       | -          | -       | 0            | 11/10                     |
| 08   | 0                                     | -  | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | 9/19                      |
| <i>Chrysothamnus viscidiflorus viscidiflorus</i> |                                       |  |       |        |          |      |             |         |            |         |              |                           |
| 98   | 0                                     | -  | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| 03   | 0                                     | -  | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | 12/21                     |
| 08   | 40                                    | -  | -     | 40     | -        | -    | 0           | 0       | -          | -       | 0            | 8/10                      |

|                              |                                       | 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>Gutierrezia sarothrae</i> |                                       |  |       |        |          |      |             |         |            |         |              |                           |
| 98                           | 0                                     | -  | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| 03                           | 20                                    | -  | 20    | -      | -        | -    | 0           | 0       | -          | -       | 0            | 6/5                       |
| 08                           | 0                                     | -  | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | 12/27                     |
| <i>Juniperus osteosperma</i> |                                       |  |       |        |          |      |             |         |            |         |              |                           |
| 98                           | 0                                     | -  | -     | -      | -        | 40   | 0           | 0       | -          | -       | 0            | -/-                       |
| 03                           | 0                                     | -  | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| 08                           | 0                                     | -  | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| <i>Pinus monophylla</i>      |                                       |  |       |        |          |      |             |         |            |         |              |                           |
| 98                           | 0                                     | -  | -     | -      | -        | 40   | 0           | 0       | -          | -       | 0            | -/-                       |
| 03                           | 0                                     | -  | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| 08                           | 0                                     | -  | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| <i>Ribes sp.</i>             |                                       |  |       |        |          |      |             |         |            |         |              |                           |
| 98                           | 0                                     | -  | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | -/-                       |
| 03                           | 0                                     | -  | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | 28/22                     |
| 08                           | 0                                     | -  | -     | -      | -        | -    | 0           | 0       | -          | -       | 0            | 33/36                     |