

MASSEY JUNCTION - TREND STUDY NO. 10R-29-10

Vegetation Type: Desert Shrub

Range Type: Crucial Deer Winter, Crucial Elk Winter

NRCS Ecological Site Description: Upland Shallow Loam (Pinyon-Utah Juniper), R034XY322UT

Land Ownership: BLM

Elevation: 6950 ft. (2119 m)

Aspect: South

Slope: 5%

Transect bearing: 175° magnetic

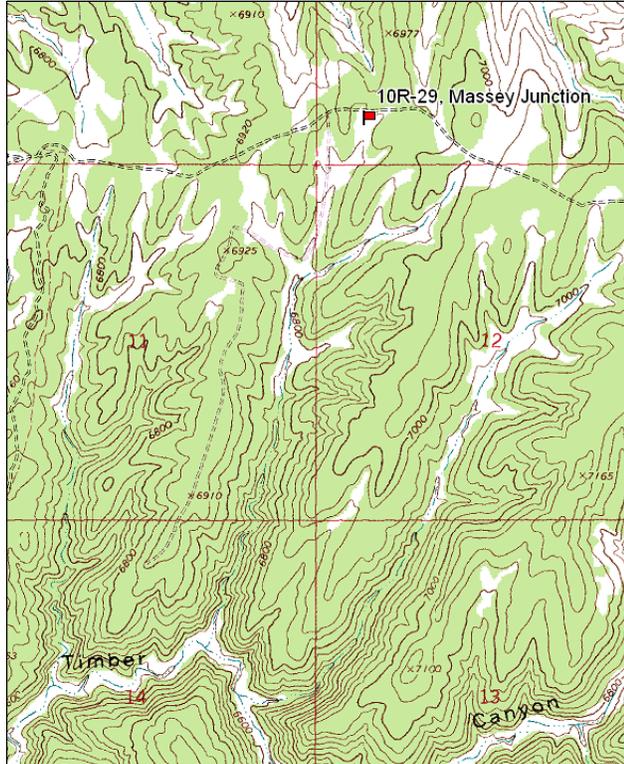
Belt placement: line 1(11ft), line 2(34 ft), line 3(59 ft), line 4(71 ft) line 5 (95 ft).

Directions:

From the Seep Ridge Road, about 10 miles north of Pine Spring, turn onto the Bitter Creek Road near McCoy Reservoir. Drive easterly on this road for 10.9 miles to where the road tops out and turn right off the main road. Go 7.65 miles staying on the main road to a fork. Turn right (east) and drive 0.2 miles to a fork, stay left and drive 1.0 miles to the witness post on the right (south) side of the road. From the witness post the 0-foot stake is located down the canyon near the tip of the P-J island separating the two drainages. The baseline continues down the draw.

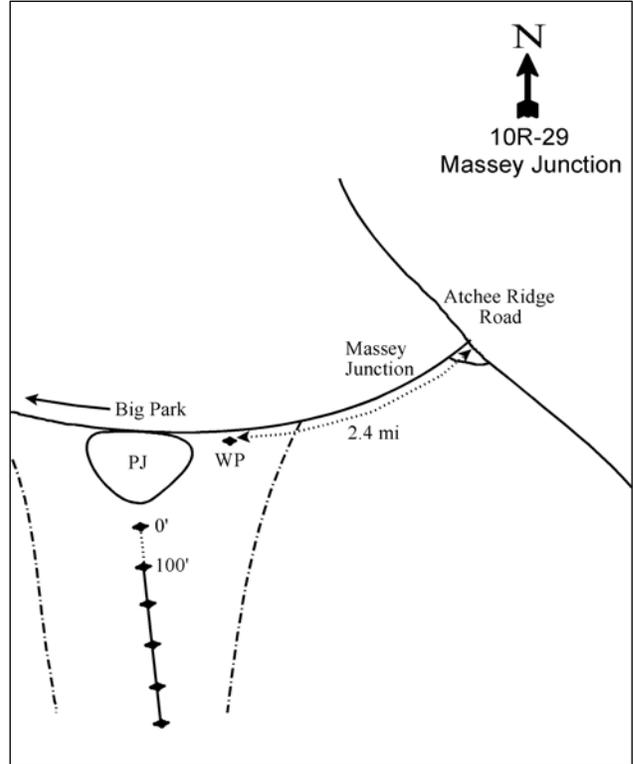
Alternate Route: From Massey Junction off Atchee Ridge Road, follow the road east towards Big Park 2.4 miles to a witness post on the left side of the road. From the witness post the 0-foot stake is located down the canyon near the tip of the P-J island separating the two drainages. The baseline continues down the draw.

Map Name: Burnt Timber Canyon



Township: 13S Range: 24E Section: 1

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 655510 E 4397165 N

MASSEY JUNCTION - TREND STUDY NO. 10R-29

Site Information

Site Description: The study samples a narrow draw surrounded by a pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) woodlands. The draw was burned probably sometime during the 1980's and now supports a salt desert shrub community. This area is used as winter range for deer and elk and grazed by cattle in the fall and spring. Grazing in the area is managed by the Bureau of Land Management (BLM) as part of the Atchee Ridge allotment. Pellet group transect data estimated light use by deer in 1999 and 2005, with more moderate use in 2010. Estimated elk use was heavy in 1999, but was more moderate in 2005 and 2010 (Table- Pellet Group Data).

Browse: The site supports two preferred browse species: fourwing saltbush (*Atriplex canescens*) and winterfat (*Ceratoides lanata*). The fourwing saltbush population is mostly mature with heavy utilization. Decadence of fourwing saltbush was high in 2005, but more moderate in the other sample years. Recruitment of young fourwing saltbush plants has been marginal. Winterfat is the most abundant shrub with high density, but there was a large decrease in the density of winterfat in 2010. The population was mostly mature from 1999 to 2005, but in 2010 the population consisted of a mixture of mature and young plants. Utilization of winterfat has been very heavy since 2005. Fringed sagebrush (*Artemisia frigida*) is abundant, but has decreased in density since 1999, and utilization is mostly light (Table - Browse Characteristics).

Herbaceous Understory: At the outset of the study grasses were dominated by thickspike wheatgrass (*Agropyron dasystachyum*), but thickspike wheatgrass decreased significantly in nested frequency in 2005 and cheatgrass (*Bromus tectorum*) increased significantly becoming the dominant species on the site. Perennial forbs are rare, though scarlet globemallow (*Sphaeralcea coccinea*) has increased steadily in frequency and cover since 1999. The annual species tansy mustard (*Descurainia pinnata*) and annual stickseed (*Lappula occidentalis*) are the only other common forbs (Table - Herbaceous Trends).

Soil: The soil texture is a clay loam with a soil reaction that is slightly alkaline (pH 7.5). Organic matter is relatively high at 5.4% (Table - Soil Analysis Data). Bare ground cover has increased since 1999 as vegetation and litter cover has become more variable being provided primarily by cheatgrass. The soil erosion condition was classified as stable in 2005 and 2010.

Trend Assessments

Browse:

- **1999 to 2005 - slightly down (-1):** Density of fourwing saltbush increased slightly, but cover decreased from 9% to 2%. Decadence of fourwing saltbush increased from 22% to 63% and poor vigor increased from 7% to 28%. Fringed sagebrush had a large decrease in density and cover.
- **2005 to 2010 - slightly down (-1):** Density of fourwing saltbush decreased slightly, but cover increased slightly to 4%. Decadence of fourwing saltbush decreased to 12% and poor vigor decreased to 11%. Winterfat had a 52% decrease in density from 11,640 plants/acre to 5,600 plants/acre and cover decreased from 5% to 1%.

Grass:

- **1999 to 2005 - down (-2):** The sum of nested frequency of perennial grasses decreased by 61% and cover decreased from 27% to 2%. There was a significant decrease in the nested frequency of thickspike wheatgrass. Cheatgrass increased significantly in nested frequency and cover increased from 7% to 29%. Cheatgrass became the dominant species on the site.
- **2005 to 2010 - up (+2):** There was a 50% increase in the sum of nested frequency of perennial grasses and cover increased to 5%, but the perennial grass component is still well below 1999 levels. There was a significant increase in the nested frequency of thickspike wheatgrass, but it remains significantly

lower than in 1999. Cheatgrass decreased significantly in nested frequency and cover decreased to 11%.

Forb:

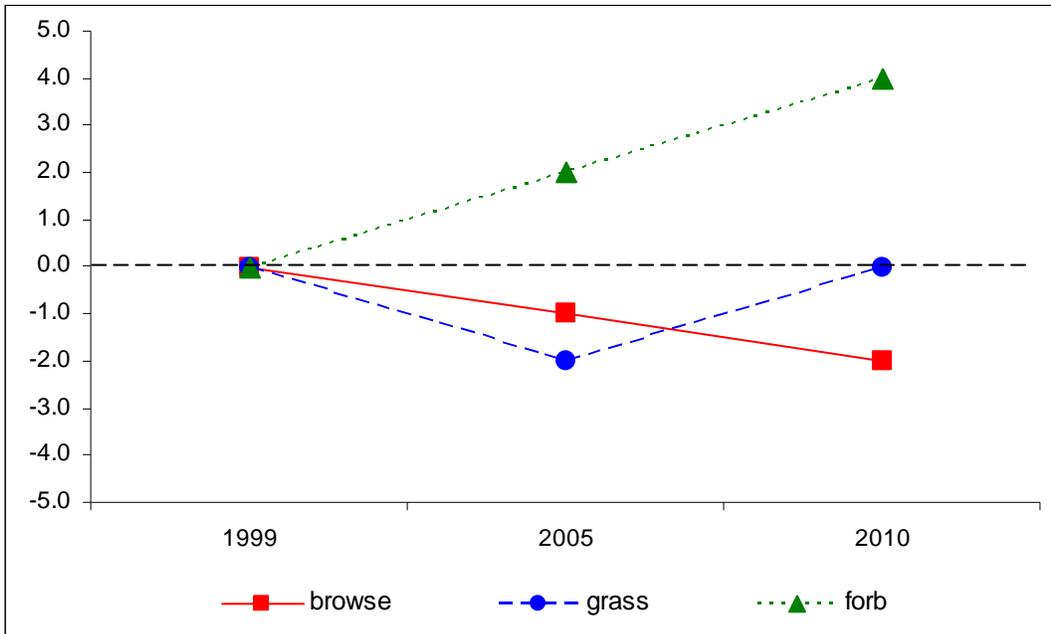
- **1999 to 2005 - up (+2):** The sum of nested frequency of perennial forbs increased by 61% and cover increased from 1% to 3%. There was a significant increase in the nested frequency of scarlet globemallow. Annual species also increased substantially.
- **2005 to 2010 - up (+2):** The perennial forb sum of nested frequency increased 83% due to a significant increase in the nested frequency of scarlet globemallow. There was a subsequent increase in the cover of perennial forbs to 5%. Annual forbs decreased in frequency and cover, but were still prevalent on the site.

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --
Management unit 10R, study no: 29

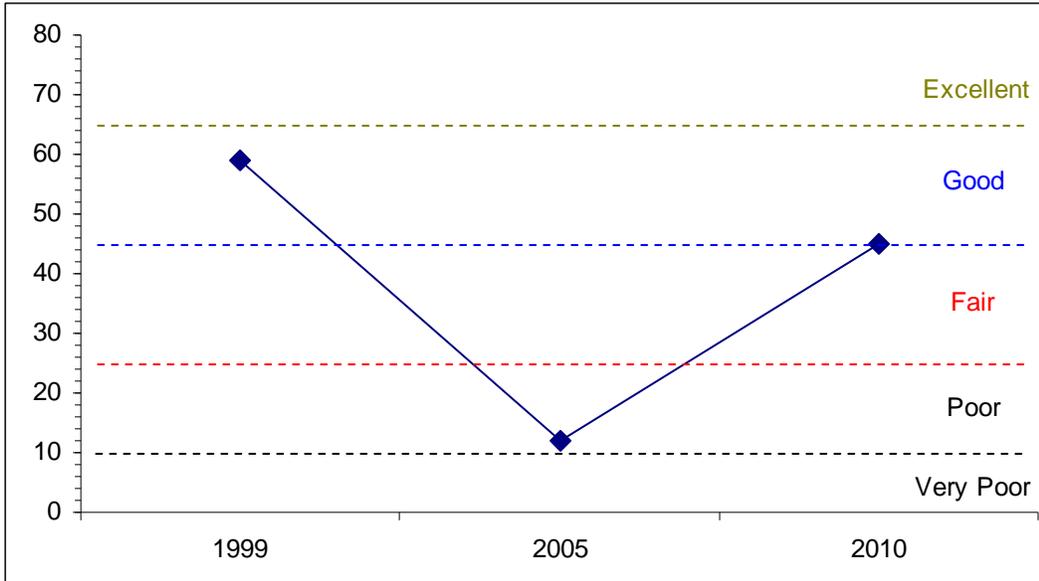
| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | Total Score | Ranking |
|------|------------------------|----------------------------|------------------------|-----------------------|--------------------|----------------------|---------------|-------------|----------------|
| 99 | 18.2 | 11.1 | 3.2 | 30.0 | -5.4 | 1.9 | 0.0 | 59.0 | Good |
| 05 | 9.2 | 8.8 | 4.1 | 4.7 | -20.0 | 5.2 | 0.0 | 12.0 | Very Poor-Poor |
| 10 | 7.3 | 12.6 | 13.6 | 9.7 | -8.2 | 10.0 | 0.0 | 45.0 | Fair-Good |

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 10R, Study no: 29



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--
 Management unit 10R, Study no: 29



HERBACEOUS TRENDS--
 Management unit 10R, Study no: 29

| Type | Species | Nested Frequency | | | Average Cover % | | |
|-----------------------------|----------------------------------|------------------|------|------|-----------------|-------|-------|
| | | '99 | '05 | '10 | '99 | '05 | '10 |
| G | <i>Agropyron dasystachyum</i> | c428 | a125 | b203 | 26.81 | 1.51 | 4.34 |
| G | <i>Bouteloua gracilis</i> | 15 | 27 | 29 | .36 | .44 | .37 |
| G | <i>Bromus tectorum</i> (a) | a335 | b425 | a330 | 7.25 | 29.22 | 10.89 |
| G | <i>Poa secunda</i> | a- | b20 | b26 | - | .41 | .14 |
| G | <i>Sitanion hystrix</i> | 1 | - | - | .03 | - | - |
| Total for Annual Grasses | | 335 | 425 | 330 | 7.25 | 29.22 | 10.89 |
| Total for Perennial Grasses | | 444 | 172 | 258 | 27.20 | 2.36 | 4.85 |
| Total for Grasses | | 779 | 597 | 588 | 34.46 | 31.59 | 15.75 |
| F | <i>Camelina microcarpa</i> (a) | - | 7 | 5 | - | .07 | .01 |
| F | <i>Chenopodium fremontii</i> (a) | - | 3 | 3 | - | .00 | .03 |
| F | <i>Chorispora tenella</i> (a) | - | 2 | - | - | .15 | - |
| F | <i>Descurainia pinnata</i> (a) | a12 | c92 | b40 | .03 | 3.16 | .25 |
| F | <i>Lappula occidentalis</i> (a) | a- | c263 | b212 | - | 7.08 | 2.65 |
| F | <i>Phlox longifolia</i> | - | - | 2 | - | - | .00 |
| F | <i>Sisymbrium altissimum</i> (a) | - | 3 | 8 | - | .15 | .18 |
| F | <i>Sphaeralcea coccinea</i> | a85 | b133 | c234 | .97 | 2.57 | 4.96 |
| F | <i>Taraxacum officinale</i> | a- | ab3 | b14 | - | .00 | .28 |
| F | <i>Tragopogon dubius</i> | - | 1 | - | - | .00 | .00 |
| Total for Annual Forbs | | 12 | 370 | 268 | 0.03 | 10.62 | 3.13 |
| Total for Perennial Forbs | | 85 | 137 | 250 | 0.97 | 2.58 | 5.25 |
| Total for Forbs | | 97 | 507 | 518 | 1.00 | 13.21 | 8.39 |

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

BROWSE TRENDS--

Management unit 10R, Study no: 29

| Type | Species | Strip Frequency | | | Average Cover % | | |
|------------------|---------------------------------|-----------------|-----|-----|-----------------|------|------|
| | | '99 | '05 | '10 | '99 | '05 | '10 |
| B | Artemisia frigida | 50 | 47 | 42 | 2.03 | .28 | .65 |
| B | Artemisia tridentata tridentata | 1 | 1 | 1 | - | - | - |
| B | Atriplex canescens | 63 | 68 | 65 | 8.95 | 2.43 | 3.92 |
| B | Ceratoides lanata | 95 | 93 | 79 | 4.01 | 4.69 | 1.37 |
| B | Gutierrezia sarothrae | 3 | 3 | 3 | - | .15 | .18 |
| Total for Browse | | 212 | 212 | 190 | 15.00 | 7.55 | 6.13 |

CANOPY COVER, LINE INTERCEPT--

Management unit 10R, Study no: 29

| Species | Percent Cover | |
|---------------------------------|---------------|------|
| | '05 | '10 |
| Artemisia frigida | 1.08 | .21 |
| Artemisia tridentata tridentata | - | .35 |
| Atriplex canescens | 3.13 | 7.21 |
| Ceratoides lanata | 4.06 | .83 |
| Gutierrezia sarothrae | .15 | .15 |

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 10R, Study no: 29

| Species | Average leader growth (in) | |
|--------------------|----------------------------|-----|
| | '05 | '10 |
| Atriplex canescens | 4.1 | 3.3 |
| Ceratoides lanata | 6.5 | 2 |

BASIC COVER--

Management unit 10R, Study no: 29

| Cover Type | Average Cover % | | |
|-------------|-----------------|-------|-------|
| | '99 | '05 | '10 |
| Vegetation | 52.90 | 50.59 | 32.95 |
| Rock | .11 | .20 | 0 |
| Pavement | 3.76 | 2.99 | 2.22 |
| Litter | 49.88 | 28.83 | 43.97 |
| Cryptogams | .03 | .34 | .00 |
| Bare Ground | 12.93 | 28.52 | 32.77 |

SOIL ANALYSIS DATA --

Management unit 10R, Study no: 29, Study Name: Massey Junction

| Effective rooting depth (in) | pH | clay loam | | | %OM | PPM P | PPM K | ds/m |
|------------------------------|-----|-----------|-------|-------|-----|-------|-------|------|
| | | %sand | %silt | %clay | | | | |
| 16.9 | 7.5 | 28.9 | 34.6 | 36.6 | 5.4 | 17.1 | 336.0 | 0.8 |

PELLET GROUP DATA--

Management unit 10R, Study no: 29

| Type | Quadrat Frequency | | |
|--------|-------------------|-----|-----|
| | '99 | '05 | '10 |
| Rabbit | 16 | 63 | 4 |
| Elk | 25 | 38 | 17 |
| Deer | 19 | 24 | 22 |
| Cattle | 6 | 6 | 20 |

| Days use per acre (ha) | | |
|------------------------|----------|---------|
| '99 | '05 | '10 |
| - | - | - |
| 90 (222) | 42 (104) | 30 (74) |
| 16 (40) | 12 (30) | 30 (74) |
| 26 (64) | 16 (39) | 36 (90) |

BROWSE CHARACTERISTICS--

Management unit 10R, Study no: 29

| Year | Plants per Acre (excluding seedlings) | Age class distribution | | | Seedling (plants/acre) | Utilization | | | Average Height Crown (in) |
|----------------------------------------|------------------------------------------|------------------------|-------------|---------------|---------------------------|---------------|------------|--------------------|------------------------------|
| | | % Young | % Mature | % Decadent | | % moderate | % heavy | % poor vigor | |
| <i>Artemisia frigida</i> | | | | | | | | | |
| 99 | 7000 | 4 | 96 | - | 20 | 24 | 13 | 0 | 7/7 |
| 05 | 2420 | 6 | 94 | - | 140 | 29 | 18 | 0 | 7/8 |
| 10 | 1960 | 55 | 45 | - | 380 | 21 | 3 | 6 | 5/8 |
| <i>Artemisia tridentata tridentata</i> | | | | | | | | | |
| 99 | 20 | 0 | 100 | - | - | 0 | 0 | 0 | 34/31 |
| 05 | 20 | 0 | 100 | - | - | 0 | 100 | 0 | 34/36 |
| 10 | 20 | 0 | 100 | - | - | 0 | 0 | 0 | 36/42 |
| <i>Atriplex canescens</i> | | | | | | | | | |
| 99 | 2100 | 7 | 71 | 22 | - | 43 | 29 | 7 | 33/41 |
| 05 | 2320 | 9 | 28 | 63 | 40 | 31 | 57 | 28 | 27/34 |
| 10 | 2060 | 15 | 74 | 12 | 520 | 38 | 28 | 11 | 26/33 |
| <i>Ceratoides lanata</i> | | | | | | | | | |
| 99 | 10780 | 6 | 93 | 0 | - | 6 | 3 | .18 | 10/8 |
| 05 | 11640 | 8 | 92 | 0 | 40 | 5 | 88 | 0 | 7/8 |
| 10 | 5600 | 49 | 51 | 0 | 140 | 29 | 58 | 0 | 5/6 |
| <i>Chrysothamnus nauseosus</i> | | | | | | | | | |
| 99 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | -/- |
| 05 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | 12/15 |
| 10 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | 37/58 |
| <i>Gutierrezia sarothrae</i> | | | | | | | | | |
| 99 | 100 | 20 | 80 | - | - | 0 | 0 | 0 | 6/6 |
| 05 | 100 | 0 | 100 | - | - | 0 | 0 | 0 | 7/8 |
| 10 | 740 | 16 | 84 | - | - | 0 | 0 | 0 | 5/6 |
| <i>Symphoricarpos oreophilus</i> | | | | | | | | | |
| 99 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | -/- |
| 05 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | -/- |
| 10 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | 34/47 |