

PR SPRING TOTAL ENCLOSURE - TREND STUDY NO. 10R-32-10

Vegetation Type: Mountain Brush

Range Type: Crucial Deer Summer (Fawning habitat), Crucial Elk Summer (Calving habitat)

NRCS Ecological Site Description: [Mountain Stony Loam \(Browse\), R048AY451UT](#)

Land Ownership: SITLA

Elevation: 8200 ft. (2500 m)

Aspect: Southeast

Slope: 2-3%

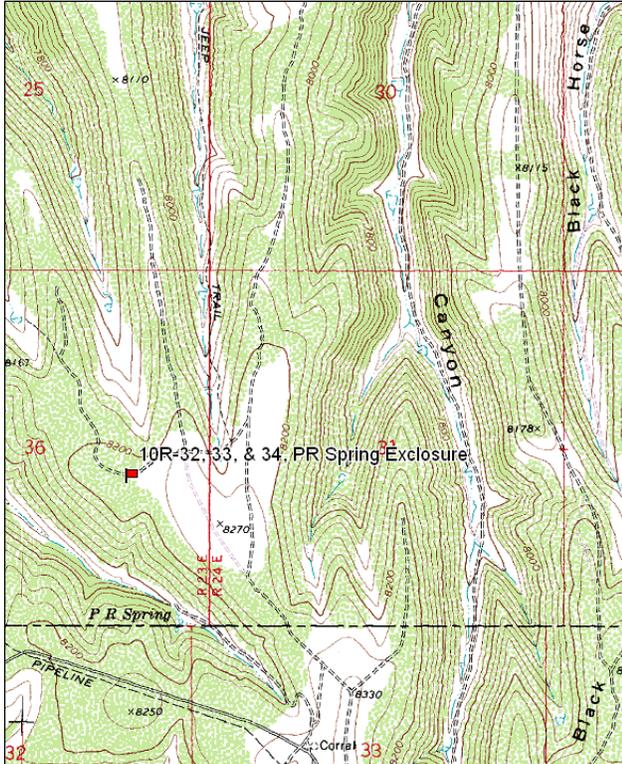
Transect bearing: 260° magnetic

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

Directions:

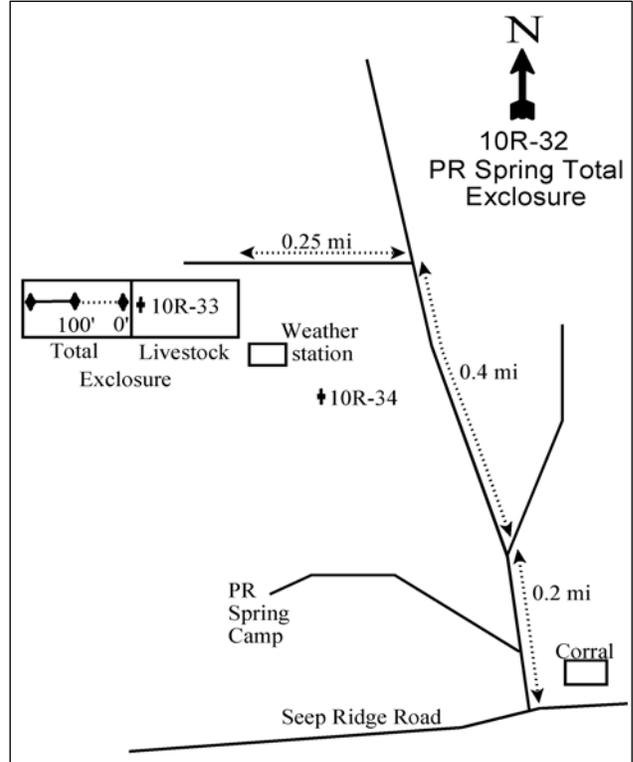
On Seep Ridge Road go to the PR Spring turnout. Travel 0.2 miles staying right (do not go down road to PR Spring and campground). Continue left 0.4 miles. Turn left once again and travel approximately 0.25 miles to a weather station then the enclosure. The 0-foot stake in the total enclosure is located near the fence separating the total and livestock enclosures. The 0-foot stake is five fence posts from the north fence. The first baseline is 100 feet long and the second baseline is 86 feet long. The 0-foot stake is marked by browse tag #435.

Map Name: PR Spring



Township: 15S Range: 23E Section: 36

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 647370 E 4370119 N

Site Information

Site Description: This study was established in 2002 to gather baseline data for a three-way enclosure that was built in 2001 by the Bureau of Land Management (BLM) near PR Spring on the North Book Cliffs. The transect samples a mountain brush community within the total enclosure which is now inaccessible to big game or livestock. Due to the dimensions of the enclosure, the sampling baseline is only 200 feet in length. The area represents summer range for wildlife. Grazing in the area is managed by the BLM as part of the Sweetwater allotment. In 2002, a pellet group transect was read to estimate use from before the enclosure was constructed. Estimated elk and deer use was moderate, and cattle use was estimated to be light (Table - Pellet Group Data).

Browse: The browse component dominates the vegetation community providing the majority of the vegetation cover on the site. Several preferred species are present including Utah serviceberry (*Amelanchier utahensis*), mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), true mountain mahogany (*Cercocarpus montanus*) and antelope bitterbrush (*Purshia tridentata*) provide a large proportion of the browse cover on the site. Snowberry (*Symphoricarpos oreophilus*), although less preferred, provides the highest average cover (Table - Browse Trends) and has the highest density of any single species in the total enclosure. Prior to the enclosure, use on serviceberry and mahogany was moderate to heavy, while use on mountain big sagebrush was light (Table - Browse Characteristics). Less preferred browse sampled include stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*), Gambel oak (*Quercus gambelii*) and grey horsebrush (*Tetradymia canescens*).

Herbaceous Understory: Grasses are comprised entirely of perennial species including sedge (*Carex* sp.), thickspike wheatgrass (*Agropyron dasystachyum*), mutton bluegrass (*Poa fendleriana*) and Kentucky bluegrass (*P. pratensis*). Most of the grasses are found underneath, or in close proximity to, shrubs and it was noted that interspaces were relatively bare in 2002. The forb component is diverse, but has only fair production. Two species, weedy milkvetch (*Astragalus miser*) and mat penstemon (*Penstemon caespitosus*), have provide the majority of the forb cover. Composition is fairly good with desirable species such as pale agoseris (*Agoseris glauca*), yellow Indian paintbrush (*Castilleja flava*), redroot eriogonum (*Eriogonum racemosum*), sulfur eriogonum (*E. umbellatum*) and Lewis flax (*Linum lewisii*) present (Table - Herbaceous Trends).

Soil: Soils on the site are clay loam in texture and neutral in reactivity (pH 6.7). Percent organic matter is moderate at 3.6% (Table - Soil Analysis Data). Bare ground cover is minimal due to the abundance of vegetation and litter cover (Table - Basic Cover). The soil erosion condition was classified as stable in 2002, 2005 and 2010.

Trend Assessments

Browse:

- **2002 to 2005 - slightly down (-1):** The density and cover of the four preferred browse species, mountain big sagebrush, Utah serviceberry, true mountain mahogany and antelope bitterbrush, decreased slightly. Decadence also increased slightly in sagebrush, serviceberry and mahogany, but was not considered high.
- **2005 to 2010 - stable (0):** Density decreased slightly in serviceberry and sagebrush, but increased in bitterbrush and mahogany. Decadence decreased in sagebrush, serviceberry and mahogany.

Grass:

- **2002 to 2005 - stable (0):** There was little change in the sum of nested frequency or cover of perennial grasses.

- **2005 to 2010 - stable (0):** The sum of nested frequency of perennial grasses decreased by 11%, but cover increased from 13% to 18%.

Forb:

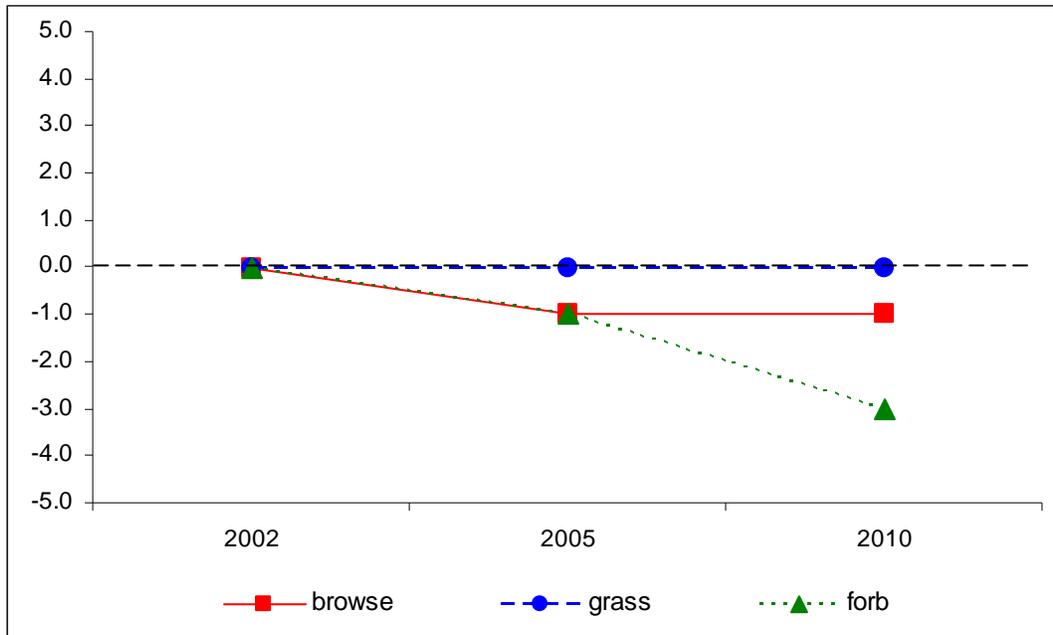
- **2002 to 2005 - slightly down (-1):** There was a 14% decrease in the sum of nested frequency of perennial forbs, though cover increased slightly.
- **2005 to 2010 - down (-2):** The sum of nested frequency of perennial grasses decreased by 31% with a slight decrease in cover.

DEER DESIRABLE COMPONENTS INDEX - HIGH POTENTIAL SCALE --
Management unit 10R, study no: 32

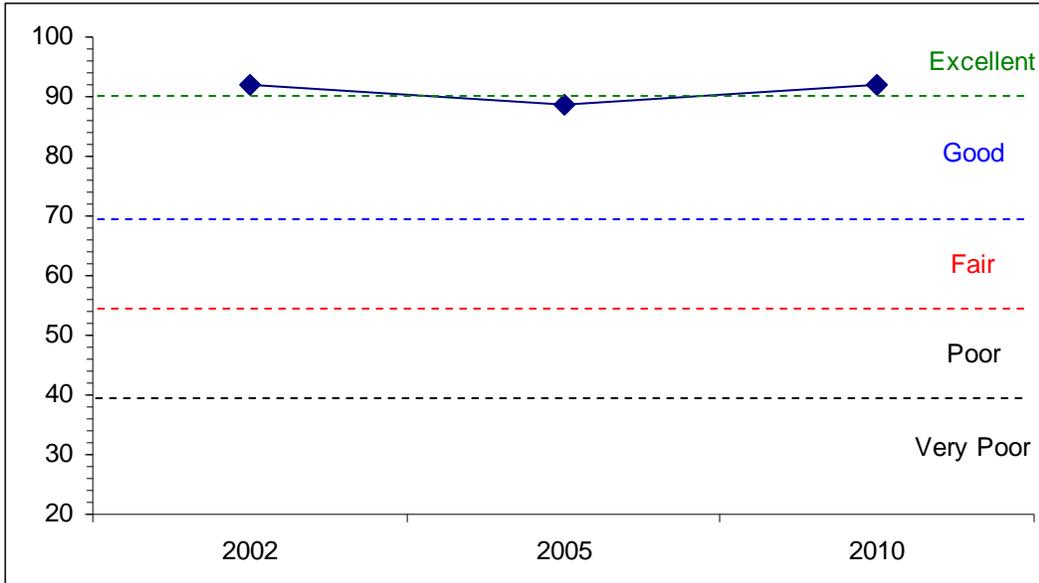
| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | Total Score | Ranking |
|------|------------------------|----------------------------|------------------------|-----------------------|--------------------|----------------------|---------------|-------------|----------------|
| 02 | 30.0 | 12.2 | 14.8 | 25.1 | 0.0 | 10.0 | 0.0 | 92.1 | Excellent |
| 05 | 30.0 | 9.1 | 13.3 | 26.3 | 0.0 | 10.0 | 0.0 | 88.7 | Good-Excellent |
| 10 | 30.0 | 13.6 | 8.5 | 30.0 | 0.0 | 10.0 | 0.0 | 92.0 | Excellent |

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 10R, Study no: 32



DEER DESIRABLE COMPONENTS INDEX TREND, HIGH POTENTIAL--
 Management unit 10R, Study no: 32



HERBACEOUS TRENDS--
 Management unit 10R, Study no: 32

| Type | Species | Nested Frequency | | | Average Cover % | | |
|-----------------------------|--------------------------------------|------------------|------------------|-----------------|-----------------|-------|-------|
| | | '02 | '05 | '10 | '02 | '05 | '10 |
| G | <i>Agropyron dasystachyum</i> | 193 | 189 | 148 | 3.82 | 2.81 | 2.83 |
| G | <i>Agropyron spicatum</i> | 5 | 4 | 4 | .06 | .03 | .15 |
| G | <i>Carex sp.</i> | 148 | 92 | 103 | 5.37 | 3.12 | 4.81 |
| G | <i>Koeleria cristata</i> | 6 | - | 3 | .18 | - | .03 |
| G | <i>Poa fendleriana</i> | 74 | 113 | 95 | 2.85 | 4.34 | 6.54 |
| G | <i>Poa pratensis</i> | _a 16 | _b 68 | _b 64 | .25 | 2.83 | 3.84 |
| Total for Annual Grasses | | 0 | 0 | 0 | 0 | 0 | 0 |
| Total for Perennial Grasses | | 442 | 466 | 417 | 12.55 | 13.14 | 18.21 |
| Total for Grasses | | 442 | 466 | 417 | 12.55 | 13.14 | 18.21 |
| F | <i>Agoseris glauca</i> | 4 | - | 2 | .01 | - | .09 |
| F | <i>Androsace septentrionalis (a)</i> | _a - | _b 12 | _a - | - | .07 | - |
| F | <i>Antennaria rosea</i> | 4 | 3 | - | .01 | .03 | - |
| F | <i>Arenaria sp.</i> | _{ab} 5 | _b 11 | _a - | .03 | .05 | - |
| F | <i>Aster sp.</i> | _a - | _{ab} 1 | _b 10 | - | .00 | .10 |
| F | <i>Astragalus miser</i> | 91 | 77 | 76 | 2.77 | 3.04 | 3.62 |
| F | <i>Astragalus utahensis</i> | 6 | 1 | 1 | .15 | .00 | .03 |
| F | <i>Balsamorhiza sagittata</i> | 1 | - | - | .00 | - | - |
| F | <i>Castilleja flava</i> | _b 31 | _{ab} 16 | _a 10 | .49 | .11 | .21 |
| F | <i>Cirsium sp.</i> | 19 | 14 | 20 | .15 | .70 | 1.21 |
| F | <i>Collinsia parviflora (a)</i> | 2 | 9 | - | .00 | .04 | - |
| F | <i>Crepis acuminata</i> | 5 | - | 6 | .03 | .00 | .03 |
| F | <i>Delphinium nuttallianum</i> | - | 3 | - | - | .03 | - |
| F | <i>Erigeron eatonii</i> | _b 75 | _b 80 | _a 44 | .54 | .99 | .43 |
| F | <i>Eriogonum racemosum</i> | _b 18 | _a 4 | _a - | .13 | .03 | - |

| T y p e | Species | Nested Frequency | | | Average Cover % | | |
|---------------------------|---------------------------------|------------------|------------------|-----------------|-----------------|------|------|
| | | '02 | '05 | '10 | '02 | '05 | '10 |
| F | <i>Eriogonum umbellatum</i> | 20 | 14 | 13 | .37 | .68 | .10 |
| F | <i>Ipomopsis aggregata</i> | 4 | 2 | - | .03 | .00 | - |
| F | <i>Lepidium sp. (a)</i> | ab ³ | b ¹¹ | a ¹ | .01 | .03 | .00 |
| F | <i>Linum lewisii</i> | 11 | 9 | 12 | .08 | .20 | .19 |
| F | <i>Machaeranthera canescens</i> | 4 | 4 | 4 | .03 | .03 | .16 |
| F | <i>Penstemon caespitosus</i> | b ¹²⁹ | b ¹⁰⁴ | a ⁴⁰ | 1.56 | 1.81 | .43 |
| F | <i>Phlox longifolia</i> | 7 | 18 | 9 | .02 | .11 | .05 |
| F | <i>Polygonum douglasii (a)</i> | a ⁻ | b ⁵⁴ | a ⁵ | - | .16 | .00 |
| F | <i>Potentilla gracilis</i> | - | - | 5 | - | - | .01 |
| F | <i>Senecio integerrimus</i> | a ⁻ | ab ² | b ⁹ | - | .00 | .07 |
| F | <i>Streptanthus cordatus</i> | - | - | 1 | - | - | .03 |
| F | <i>Taraxacum officinale</i> | a ¹⁴ | b ²⁴ | a ⁵ | .03 | .26 | .04 |
| F | <i>Tragopogon dubius</i> | 4 | 1 | - | .01 | .00 | - |
| Total for Annual Forbs | | 5 | 86 | 6 | 0.01 | 0.31 | 0.00 |
| Total for Perennial Forbs | | 452 | 388 | 267 | 6.51 | 8.17 | 6.83 |
| Total for Forbs | | 457 | 474 | 273 | 6.52 | 8.48 | 6.84 |

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

BROWSE TRENDS--

Management unit 10R, Study no: 32

| T y p e | Species | Strip Frequency | | | Average Cover % | | |
|------------------|--|-----------------|-----|-----|-----------------|-------|-------|
| | | '02 | '05 | '10 | '02 | '05 | '10 |
| B | <i>Amelanchier utahensis</i> | 55 | 47 | 38 | 11.43 | 10.35 | 10.63 |
| B | <i>Artemisia tridentata vaseyana</i> | 77 | 77 | 67 | 14.28 | 12.20 | 14.10 |
| B | <i>Cercocarpus montanus</i> | 66 | 64 | 65 | 7.50 | 6.93 | 6.37 |
| B | <i>Chrysothamnus viscidiflorus viscidiflorus</i> | 60 | 52 | 55 | 3.65 | 3.75 | 5.19 |
| B | <i>Gutierrezia sarothrae</i> | 0 | 1 | 0 | - | - | - |
| B | <i>Purshia tridentata</i> | 11 | 7 | 9 | .33 | .06 | 1.92 |
| B | <i>Quercus gambelii</i> | 20 | 18 | 9 | .95 | .39 | 1.11 |
| B | <i>Symphoricarpos oreophilus</i> | 93 | 97 | 93 | 17.60 | 15.85 | 19.67 |
| B | <i>Tetradymia canescens</i> | 3 | 2 | 3 | .04 | .00 | - |
| Total for Browse | | 385 | 365 | 339 | 55.81 | 49.56 | 59.02 |

CANOPY COVER, LINE INTERCEPT--

Management unit 10R, Study no: 32

| Species | Percent Cover | | |
|---|---------------|-------|-------|
| | '02 | '05 | '10 |
| Amelanchier utahensis | 13.61 | 11.44 | 12.71 |
| Artemisia tridentata vaseyana | 20.08 | 15.36 | 18.64 |
| Cercocarpus montanus | 5.36 | 7.15 | 6.73 |
| Chrysothamnus viscidiflorus viscidiflorus | .96 | 2.54 | 3.04 |
| Gutierrezia sarothrae | .88 | - | - |
| Purshia tridentata | .20 | .06 | .41 |
| Quercus gambelii | .21 | .61 | 1.56 |
| Symphoricarpos oreophilus | 20.31 | 19.25 | 20.46 |

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 10R, Study no: 32

| Species | Average leader growth (in) | | |
|-------------------------------|----------------------------|-----|-----|
| | '02 | '05 | '10 |
| Amelanchier utahensis | 3.1 | 3.3 | 2.5 |
| Artemisia tridentata vaseyana | 2.1 | 2.2 | 1.5 |
| Cercocarpus montanus | 1.9 | 2.3 | 4.9 |

BASIC COVER--

Management unit 10R, Study no: 32

| Cover Type | Average Cover % | | |
|-------------|-----------------|-------|-------|
| | '02 | '05 | '10 |
| Vegetation | 58.40 | 59.05 | 75.02 |
| Rock | .23 | .04 | .00 |
| Pavement | 7.22 | 8.35 | 5.97 |
| Litter | 58.92 | 50.58 | 58.12 |
| Cryptogams | .25 | .10 | .18 |
| Bare Ground | 9.25 | 3.23 | 4.73 |

SOIL ANALYSIS DATA --

Management unit 10R, Study no: 32, Study Name: PR Spring Total Exclosure

| Effective rooting depth (in) | pH | clay loam | | | %OM | PPM P | PPM K | ds/m |
|------------------------------|-----|-----------|-------|-------|-----|-------|-------|------|
| | | %sand | %silt | %clay | | | | |
| 9.7 | 6.8 | 35.3 | 32.7 | 32.0 | 3.6 | 14.9 | 291.2 | 0.8 |

PELLET GROUP DATA--

Management unit 10R, Study no: 32

| Type | Quadrat Frequency | | | Days use per acre (ha) | | |
|--------|-------------------|-----|-----|------------------------|-----|-----|
| | '02 | '05 | '10 | '02 | '05 | '10 |
| Rabbit | 12 | 42 | 4 | - | - | - |
| Elk | 9 | - | - | 23 (56) | - | - |
| Deer | 15 | 3 | - | 39 (96) | - | - |
| Cattle | 1 | 1 | - | 7 (18) | - | - |

BROWSE CHARACTERISTICS--
Management unit 10R, Study no: 32

| Year | Plants per Acre (excluding seedlings) | Age class distribution | | | Seedling (plants/acre) | Utilization | | % poor vigor | Average Height Crown (in) |
|--|--|------------------------|----------|------------|---------------------------|-------------|---------|--------------|------------------------------|
| | | % Young | % Mature | % Decadent | | % moderate | % heavy | | |
| <i>Amelanchier utahensis</i> | | | | | | | | | |
| 02 | 1800 | 42 | 49 | 9 | 20 | 16 | 27 | 4 | 52/51 |
| 05 | 1300 | 38 | 43 | 18 | 20 | 0 | 0 | 14 | 46/50 |
| 10 | 1080 | 17 | 81 | 2 | 200 | 0 | 0 | 4 | 52/52 |
| <i>Artemisia tridentata vaseyana</i> | | | | | | | | | |
| 02 | 3560 | 21 | 64 | 15 | 100 | 10 | 4 | 4 | 30/38 |
| 05 | 3180 | 13 | 60 | 27 | 320 | 0 | 0 | 25 | 23/31 |
| 10 | 3000 | 9 | 83 | 9 | - | 3 | 0 | 6 | 27/36 |
| <i>Cercocarpus montanus</i> | | | | | | | | | |
| 02 | 2920 | 26 | 73 | 1 | 80 | 14 | 52 | .68 | 43/35 |
| 05 | 2600 | 30 | 59 | 11 | 220 | 0 | 0 | 12 | 46/37 |
| 10 | 2760 | 30 | 68 | 2 | 140 | 0 | 0 | 2 | 50/39 |
| <i>Chrysothamnus viscidiflorus viscidiflorus</i> | | | | | | | | | |
| 02 | 2980 | 9 | 90 | 1 | 40 | 0 | 0 | 0 | 13/14 |
| 05 | 2680 | 7 | 91 | 1 | - | 4 | .74 | .74 | 10/13 |
| 10 | 2660 | 11 | 89 | 1 | 60 | 0 | 0 | .75 | 15/16 |
| <i>Gutierrezia sarothrae</i> | | | | | | | | | |
| 02 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | -/- |
| 05 | 20 | 0 | 100 | - | - | 0 | 0 | 0 | -/- |
| 10 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | -/- |
| <i>Mahonia repens</i> | | | | | | | | | |
| 02 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | -/- |
| 05 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | 4/7 |
| 10 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | -/- |
| <i>Purshia tridentata</i> | | | | | | | | | |
| 02 | 260 | 0 | 92 | 8 | - | 31 | 46 | 0 | 12/18 |
| 05 | 160 | 13 | 88 | 0 | - | 0 | 0 | 0 | 12/18 |
| 10 | 180 | 22 | 78 | 0 | 20 | 0 | 0 | 0 | 22/28 |
| <i>Quercus gambelii</i> | | | | | | | | | |
| 02 | 560 | 50 | 50 | - | 20 | 4 | 0 | 0 | -/- |
| 05 | 920 | 93 | 7 | - | 40 | 0 | 0 | 0 | 12/9 |
| 10 | 300 | 33 | 67 | - | 800 | 0 | 0 | 7 | 21/15 |
| <i>Symphoricarpos oreophilus</i> | | | | | | | | | |
| 02 | 5320 | 18 | 82 | 0 | 140 | 0 | 0 | 0 | 17/31 |
| 05 | 8220 | 19 | 81 | 0 | - | 0 | 0 | 0 | 15/21 |
| 10 | 8000 | 22 | 78 | 0 | - | .25 | 0 | 0 | 18/28 |
| <i>Tetradymia canescens</i> | | | | | | | | | |
| 02 | 100 | 40 | 60 | 0 | - | 0 | 0 | 0 | 7/8 |
| 05 | 80 | 0 | 100 | 0 | - | 0 | 0 | 0 | 6/7 |
| 10 | 80 | 0 | 75 | 25 | - | 0 | 0 | 25 | -/- |

PR SPRING EXCLOSURE COMPARISON
TREND STUDY NO. 10R-32, 10R-33 & 10R-34

Site Information

Site Description: The studies were established in 2002 to gather baseline data for a three-way enclosure that was built in 2001 by the Bureau of Land Management (BLM) near PR Spring on the North Book Cliffs. Grazing in the area is managed by the BLM as part of the Sweetwater allotment. The enclosure complex was not built in a totally homogeneous area. The total and livestock enclosures were placed in an area where several browse species are moderately abundant. This includes large, tree-like serviceberry (*Amelanchier utahensis*) plants that provide an abundance of overhead canopy cover. The transect that monitors the community outside of the enclosures is much more open where mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) is the dominant species. Due to the dimensions of the enclosure, the transects established inside the total (10R-32) and livestock (10R-33) enclosures are only 200 feet in length, while the transect outside (10R-34) is 500 feet long. Some of the difference in vegetation characteristics between these studies may arise from differing transect lengths, as well as the heterogeneity of the vegetation community. Pellet group data was collected inside the total enclosure for 2002 to capture the construction year utilization. Pellet group data has indicated moderate to heavy use by deer and light to moderate use by elk throughout the study years. There has been variability in wildlife use between the livestock enclosure and outside the enclosure, with higher use by deer and elk in 2002 and 2010 outside the enclosure, but higher use inside the livestock enclosure in 2005. Cattle use appears to be light in the area (Table 1).

Browse: The browse component dominates the vegetation community on all three of the study transects. Browse cover is highest inside the total enclosure with serviceberry, mountain big sagebrush, snowberry (*Symphoricarpos oreophilus*) and true mountain mahogany (*Cercocarpus montanus*) providing nearly all of the browse cover. These four species also dominate the livestock enclosure, but mountain big sagebrush is the predominant species. Outside of the enclosure, mountain big sagebrush dominates the sample area with a large component of snowberry and bitterbrush (*Purshia tridentata*). Serviceberry and mahogany are less common outside the enclosure. Utilization of sagebrush has been mostly light to moderate outside the enclosure and in the livestock enclosure. Use of sagebrush was moderate in the livestock enclosure in 2010. The total and livestock enclosures have displayed decreasing recruitment of young mountain big sagebrush plants over the course of the study, while recruitment has remained similar outside the enclosure. All three studies have shown a decrease in decadence of mountain big sagebrush from 2005 to 2010 (Table 2).

Herbaceous Understory: Perennial grasses are abundant on the studies, but are not particularly diverse. Bluegrass species (*Poa spp.*), including Kentucky bluegrass (*P. pratensis*), dominate the grass component on all three studies, and have generally increased in cover since 2002. Perennial grasses tend to have higher cover and sum of nested frequency outside the enclosure primarily due higher values provided by the bluegrass species. Perennial forbs are diverse and fairly abundant on the three studies. Perennial forb sum of nested frequency and cover are higher outside the enclosure and in the livestock enclosure than in the total enclosure. There was a general increase in the cover of perennial forbs on all three studies in 2005, but cover decreased again in 2010. The sum of nested frequency of perennial forbs has steadily decreased in the total and livestock enclosures since 2002, but has remained similar outside of the enclosure (Table 3).

Soil: Due to the close proximity of the studies, soil attributes are similar on the studies. Soils have a clay loam texture with a neutral pH. Basic ground cover characteristics are similar between all of the transects. Vegetation and litter cover are abundant, especially the browse component. Bare ground cover is low on all three studies, but is lowest within the total enclosure.

Exclosure Complex Summary

| Study Name | Year | Deer | Elk | Cattle |
|---------------------------------|------|---------------------------|---------------------------|---------------------------|
| | | <i>days use/acre (ha)</i> | <i>days use/acre (ha)</i> | <i>days use/acre (ha)</i> |
| Total Exclosure (10R-32) | 2002 | 39 (96) | 23 (56) | 7 (18) |
| | 2005 | -- | -- | -- |
| | 2010 | -- | -- | -- |
| Livestock Exclosure (10R-33) | 2002 | 48 (117) | 19 (46) | 14 (34) |
| | 2005 | 63 (155) | 21 (53) | 14 (34) |
| | 2010 | 25 (61) | 11 (26) | -- |
| Outside Exclosure (10R-34) | 2002 | 73 (180) | 31 (78) | 14 (34) |
| | 2005 | 23 (5) | 7 (17) | 10 (25) |
| | 2010 | 42 (104) | 23 (58) | 13 (33) |

Table 1. Pellet group transect data estimated use for the PR Spring exclosure complex.

| Study Name | Year | Percent Canopy Cover | Density <i>Plants/acre</i> | Percent Young <i>(Plants/acre)</i> | Percent Mature <i>(Plants/acre)</i> | Percent Decadent <i>(Plants/acre)</i> | Ave. height/crown <i>(in)</i> |
|---------------------------------|------|-----------------------------|-------------------------------|---------------------------------------|--|--|----------------------------------|
| | | Total Exclosure (10R-32) | 2002 | 20.08 | 3560 | 21 | 64 |
| | 2005 | 15.36 | 3180 | 13 | 60 | 27 | 23/31 |
| | 2010 | 18.64 | 3000 | 9 | 83 | 9 | 27/36 |
| Livestock Exclosure (10R-33) | 2002 | 17.66 | 3240 | 14 | 50 | 36 | 29/37 |
| | 2005 | 17.48 | 2940 | 10 | 61 | 29 | 29/37 |
| | 2010 | 20.83 | 2980 | 6 | 76 | 18 | 28/40 |
| Outside Exclosure (10R-34) | 2002 | 26.10 | 4180 | 7 | 61 | 32 | 31/38 |
| | 2005 | 24.14 | 3940 | 7 | 56 | 38 | 30/38 |
| | 2010 | 30.36 | 3900 | 6 | 78 | 16 | 32/43 |

Table 2. Browse characteristics of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) for the PR Spring exclosure study sites.

| Study Name | Year | Perennial Grass Species | | | Perennial Forb Species | | |
|---------------------------------|------|-------------------------|--------------------------------|----------------------|------------------------|--------------------------------|----------------------|
| | | <i>n</i> | <i>Sum of Nested Frequency</i> | <i>Percent Cover</i> | <i>n</i> | <i>Sum of Nested Frequency</i> | <i>Percent Cover</i> |
| Total Exclosure (10R-32) | 2002 | 6 | 442 | 12.55 | 19 | 452 | 6.51 |
| | 2005 | 5 | 466 | 13.14 | 19 | 388 | 8.17 |
| | 2010 | 6 | 417 | 18.21 | 17 | 267 | 6.83 |
| Livestock Exclosure (10R-33) | 2002 | 6 | 455 | 14.08 | 19 | 724 | 9.31 |
| | 2005 | 8 | 538 | 17.38 | 18 | 640 | 11.69 |
| | 2010 | 7 | 498 | 17.06 | 19 | 569 | 7.91 |
| Outside Exclosure (10R-34) | 2002 | 8 | 679 | 16.36 | 21 | 628 | 6.05 |
| | 2005 | 7 | 636 | 17.50 | 22 | 710 | 12.53 |
| | 2010 | 7 | 619 | 25.00 | 19 | 614 | 8.81 |

Table 3. Number of species sampled (*n*), sum of nested frequency and cover of perennial grasses and perennial forbs in the three studies at the PR Spring exclosure complex.