

Trend Study 10R-15-05

Study site name: Saddle Horse .

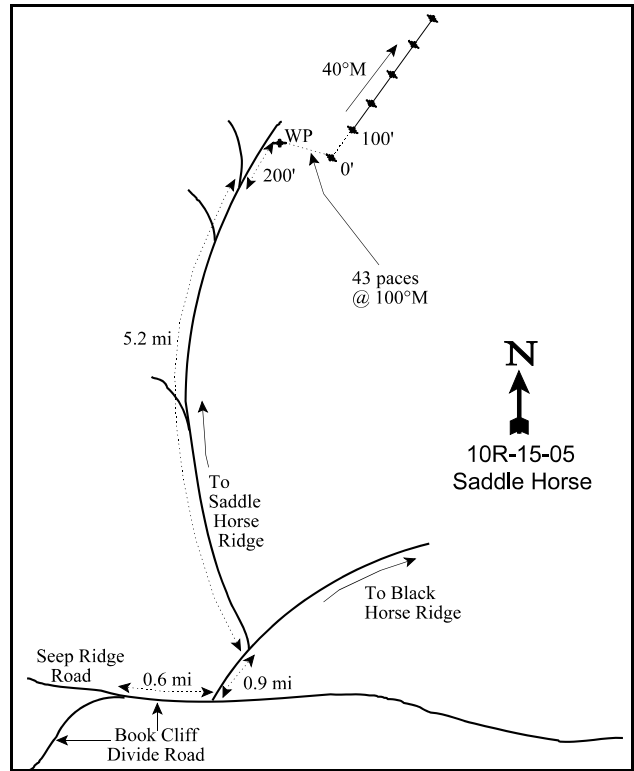
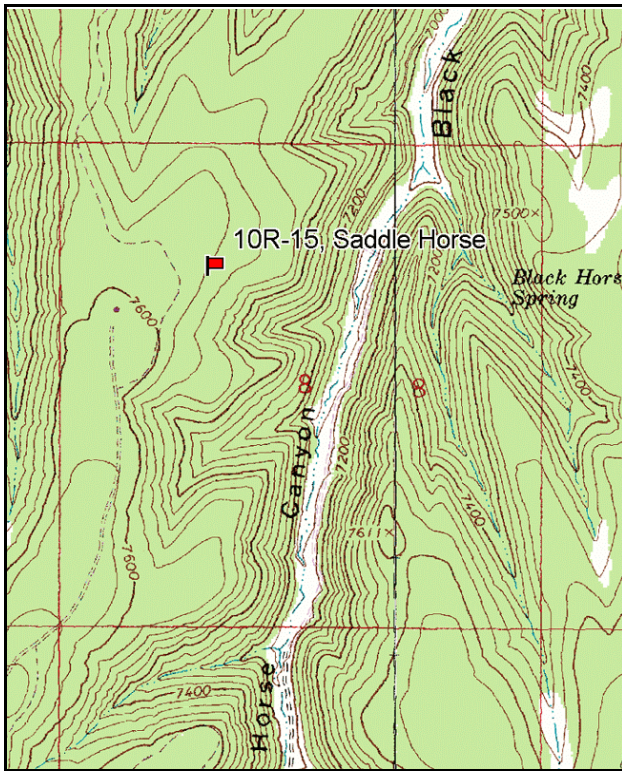
Vegetation Type: Mountain Brush .

Compass bearing: frequency baseline 40 degrees magnetic.

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

LOCATION DESCRIPTION

From the intersection of Seep Ridge road and Book Cliffs Divide road, continue 0.6 miles to an intersection with the road to Black Horse Ridge. Turn left here and go 0.9 miles to the intersection with the road to Saddle Horse Ridge. Go left here and continue 5.2 miles to the third fork (staying right through two forks). From the third fork the witness post is approximately 200 feet on the right side of the road. From the witness post the 0' stake is 43 paces at 100°M.



Map name: Seep Canyon

Diagrammatic Sketch

Township 15S, Range 24E, Section 8.

GPS: NAD 27, UTM 12S 4376915 N, 649791 E

DISCUSSION

Saddle Horse - Trend Study No. 10R-15

The Saddle Horse trend study was established in 1998. It samples a chaining that was done in the 1960's on Saddle Horse Ridge which is between PR Canyon and Black Horse Canyon. The site supports a mixed community of sagebrush, true mountain mahogany, bitterbrush, pinyon, and juniper. It has a slope of 10-15%, a southeast aspect, and an elevation of about 7,540 feet. A small fire burned the last 100 feet of the baseline sometime between 2000 and 2005. The area has moderate to heavy use by elk, but there is little cattle use here since there is no available water on the ridge. There are plans to pipe water to a trough about 1/4 of a mile from the study site. Pellet group data from 1998 estimated 78 elk, 11 deer, and 6 cow days use/acre (193 edu/ha, 27 ddu/ha and 15 cdu/ha). Use was lower in 2000 with 36 elk and 15 deer days use/acre estimated (89 edu/ha and 37 ddu/ha). In 2005, use was estimated at 62 elk and 37 deer days use/acre (154 edu/ha and 91 ddu/ha). Season of use for big game appears to be fall, spring and early summer.

Soil on the site is moderately deep with an effective rooting depth estimated at just over 16 inches. It has a sandy clay loam to sandy loam texture with a neutral pH. Phosphorus is marginal at 8.4 ppm and may be limiting, as values between 6 and 11 ppm may limit normal plant growth and development (Tiedemann and Lopez 2004). Rock and pavement are not abundant on the surface, but widely variable sized rocks are found throughout the soil profile. Calcium carbonate deposits are common on rocks within the soil, some up to 1/4 inch thick. An erosion condition class assessment rated erosion as slight in 2005. There is some rill erosion and minor soil pedestaling observed around shrubs, but vegetation and litter cover are adequate to prevent significant erosion.

The site supports a variety of browse, with the key species being mountain big sagebrush, true mountain mahogany, and bitterbrush. Mountain big sagebrush cover has been 3-4% with each reading. Density was 1,480 plants/acre in 1998, decreased to 1,080 plants/acre in 2000, and increased to 1,280 plants/acre in 2005. Recruitment and vigor has been excellent for sagebrush. Sagebrush is not the preferred shrub in this area due to the apparent season of use for big game (spring/fall).

The key shrub with respect to abundance and preference is bitterbrush. Bitterbrush has averaged 4-6% cover, which is about one-third of the total browse cover. Density has been between 800-980 plants/acre, with a good young age class at each reading. Bitterbrush has a prostrate spreading growth form. It has displayed moderate to heavy use. Even at this level of use, vigor has been good for most plants, but percent decadence increased to 31% in 2005. During the 2000 and 2005 readings, bitterbrush was producing abundant flowers and seed. Another key browse species is true mountain mahogany, which has averaged about 2% cover with each reading. Use was judged moderate to heavy in 1998, moderate in 2000, and heavy in 2005. Percent decadence increased from 0% in 2000 to 33% in 2005.

Other shrubs encountered include rubber rabbitbrush, snowberry, and released pinyon and juniper trees. Point-center quarter data from 2000 estimated 98 pinyon and 128 Utah juniper trees/acre. Rocky mountain juniper was also present. Average basal diameter of pinyon was 1.8 inches, while juniper was 3.4 inches. In 2005, density was lower after the fire. Pinyon density was 51 trees/acre and juniper was 53 trees/acre. Diameter was estimated at 2.4 inches for pinyon and 5.0 inches for juniper. Line intercept cover was about 4% for each species.

The herbaceous understory is quite abundant. Several grass species are found on the site but only two have been common. The dominant species is intermediate wheatgrass which provided 82-90% of the grass cover at each sampling time. It did decline significantly in 2005. Carex has also been common, but also declined in 2005. Cheatgrass is rare, but did increase significantly in 2005. It was found in 18% of the quadrats, up from 0% in 2000, and 8% in 1998. Forbs are not abundant and do not provide much additional forage. The most

common species are Watson penstemon and scarlet globemallow. Some of the grasses and forbs showed light utilization in 2000.

1998 APPARENT TREND ASSESSMENT

The soil is well protected with abundant vegetation and litter cover with no sign of significant erosion occurring. The key browse, mountain big sagebrush, mahogany, and bitterbrush, appear to have stable populations. Use is heavy on mahogany and moderate to heavy on bitterbrush, but vigor is normal for both species and percent decadence is low. Mountain big sagebrush is only lightly browsed, in good vigor, and has no decadent plants. Recruitment is also good with nearly half of the population consisting of young plants. The herbaceous understory is dominated by intermediate wheatgrass. Forbs are diverse but most species occur only occasionally. The Desirable Components Index rated this site as good on the higher potential scale. This site probably falls on the lower end of higher potential sites, so this rating is very good.

winter range condition (DC Index) - good (82) Higher potential scale

2000 TREND ASSESSMENT

Trend for soil is considered stable. Percent cover of vegetation has declined and bare ground has increased slightly but not enough to warrant a change in trend. In addition, cover and frequency of perennial grasses and forbs has also declined. The proportion of bare soil to protective cover (vegetation, litter and cryptogams) has also decreased. However, there still appears to be adequate protective ground cover to prevent serious erosion. Trend for the key browse species, mountain big sagebrush, true mountain mahogany and bitterbrush is considered stable. Mahogany and bitterbrush show moderate to heavy use but normal vigor and low percent decadence. Mountain big sagebrush does not appear to be as preferred. It displays mostly light use, good vigor and low decadence. Trend for the herbaceous understory is down due to a decline in the nested frequencies of perennial grasses and forbs. The DCI score declined due to losses of preferred browse and perennial grass cover.

TREND ASSESSMENT

soil - stable (0)

browse - stable (0)

herbaceous understory - down (-2)

winter range condition (DC Index) - fair (68) Higher potential scale

2005 TREND ASSESSMENT

The soil trend is slightly down. The ratio of bare ground to protective ground cover (vegetation, litter, and cryptogams) decreased substantially. Bare ground increased from 22% to 34%, due to a decrease of litter cover and a slight decrease of vegetation cover. Erosion was rated as slight in 2005. The browse trend is stable. Densities of the key species, bitterbrush, true mountain mahogany, and mountain big sagebrush, remained stable. Recruitment appears to be good, but percent decadence did increase. Bitterbrush and mahogany have received moderate to heavy use. The trend for the herbaceous understory is down. Perennial grass nested frequency declined 31% due to significant declines of intermediate wheatgrass and the sedge. Annual cheatgrass increased significantly but still produces less than 1% cover. Perennial forbs increased slightly, but are not abundant. The DCI score continued to decline due to losses of preferred browse and perennial grass cover, as well as increased decadency of browse.

TREND ASSESSMENT

soil - slightly down (-1)

browse - stable (0)

herbaceous understory - down (-2)

winter range condition (DC Index) - poor to fair (57) Higher potential scale

HERBACEOUS TRENDS --

Management unit 10R, Study no: 15

| Type | Species | Nested Frequency | | | Average Cover % | | |
|-----------------------------|------------------------------|------------------|------------------|------------------|-----------------|-------|-------|
| | | '98 | '00 | '05 | '98 | '00 | '05 |
| G | Agropyron cristatum | _b 16 | _a - | _{ab} 4 | .19 | - | .15 |
| G | Agropyron intermedium | _b 332 | _b 321 | _a 213 | 16.06 | 12.37 | 9.80 |
| G | Bromus tectorum (a) | _b 29 | _a - | _b 43 | .23 | - | .87 |
| G | Carex sp. | _b 63 | _b 53 | _a 23 | 1.82 | 1.10 | .31 |
| G | Oryzopsis hymenoides | 14 | 3 | 5 | .48 | .00 | .12 |
| G | Poa fendleriana | 29 | 18 | 10 | .40 | .30 | .10 |
| G | Sitanion hystrix | _b 18 | _a - | _b 16 | .38 | - | .55 |
| Total for Annual Grasses | | 29 | 0 | 43 | 0.23 | 0 | 0.87 |
| Total for Perennial Grasses | | 472 | 395 | 271 | 19.36 | 13.78 | 11.04 |
| Total for Grasses | | 501 | 395 | 314 | 19.59 | 13.78 | 11.92 |
| F | Antennaria rosea | 6 | 3 | 3 | .19 | .06 | .09 |
| F | Arabis sp. | 11 | 6 | 14 | .02 | .01 | .04 |
| F | Astragalus convallarius | 4 | - | - | .04 | - | - |
| F | Astragalus sp. | 3 | - | - | .07 | - | - |
| F | Chenopodium fremontii (a) | _a - | _a - | _b 11 | - | - | .05 |
| F | Descurainia pinnata (a) | _a - | _a - | _b 62 | - | - | .98 |
| F | Erigeron sp. | - | - | 2 | .00 | - | .00 |
| F | Lappula occidentalis (a) | _a 15 | _a 3 | _b 93 | .10 | .00 | 2.24 |
| F | Machaeranthera grindelioides | 2 | 2 | 3 | .03 | .03 | .04 |
| F | Penstemon caespitosus | 3 | - | - | .03 | - | - |
| F | Penstemon pachyphyllus | _a - | _b 11 | _{ab} 3 | - | .08 | .04 |
| F | Penstemon watsonii | _b 39 | _a 8 | _a 7 | .56 | .45 | .33 |
| F | Polygonum douglasii (a) | - | - | 4 | - | - | .00 |
| F | Senecio multilobatus | 3 | 4 | 7 | .04 | .01 | .01 |
| F | Sphaeralcea coccinea | 35 | 28 | 32 | .71 | .14 | .51 |
| F | Tragopogon dubius | 2 | - | - | .00 | - | - |
| F | Viguiera multiflora | 3 | 1 | 3 | .03 | .03 | .00 |
| Total for Annual Forbs | | 15 | 3 | 170 | 0.10 | 0.00 | 3.29 |
| Total for Perennial Forbs | | 111 | 63 | 74 | 1.73 | 0.81 | 1.08 |
| Total for Forbs | | 126 | 66 | 244 | 1.84 | 0.81 | 4.37 |

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

BROWSE TRENDS --

Management unit 10R, Study no: 15

| Type | Species | Strip Frequency | | | Average Cover % | | |
|------------------|---|-----------------|-----|-----|-----------------|-------|-------|
| | | '98 | '00 | '05 | '98 | '00 | '05 |
| B | Amelanchier utahensis | 1 | 0 | 1 | .00 | - | .00 |
| B | Artemisia tridentata vaseyana | 36 | 24 | 29 | 4.28 | 3.15 | 3.34 |
| B | Cercocarpus montanus | 10 | 3 | 9 | 2.29 | 2.12 | 1.72 |
| B | Chrysothamnus nauseosus hololeucus | 2 | 2 | 3 | .30 | .06 | .18 |
| B | Chrysothamnus viscidiflorus viscidiflorus | 1 | 1 | 2 | - | - | - |
| B | Juniperus osteosperma | 6 | 5 | 3 | 4.44 | 3.50 | 4.03 |
| B | Opuntia fragilis | 2 | 3 | 5 | .38 | - | .15 |
| B | Pinus edulis | 7 | 7 | 5 | 1.37 | 2.27 | 2.54 |
| B | Purshia tridentata | 26 | 28 | 23 | 6.08 | 5.57 | 4.36 |
| B | Symphoricarpos oreophilus | 2 | 1 | 1 | .15 | .66 | - |
| Total for Browse | | 93 | 74 | 81 | 19.33 | 17.34 | 16.36 |

CANOPY COVER, LINE INTERCEPT --

Management unit 10R, Study no: 15

| Species | Percent Cover | | |
|------------------------------------|---------------|------|------|
| | '98 | '00 | '05 |
| Artemisia tridentata vaseyana | - | - | 5.08 |
| Cercocarpus montanus | - | .80 | 1.89 |
| Chrysothamnus nauseosus hololeucus | - | - | .05 |
| Juniperus osteosperma | 2.59 | 1.60 | 4.08 |
| Juniperus scopulorum | - | 1.60 | - |
| Opuntia fragilis | - | - | .06 |
| Pinus edulis | - | 1.39 | 4.15 |
| Purshia tridentata | - | - | 2.70 |
| Symphoricarpos oreophilus | - | - | .08 |

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 10R, Study no: 15

| Species | Average leader growth (in) |
|-------------------------------|----------------------------|
| | '05 |
| Artemisia tridentata vaseyana | 2.3 |
| Cercocarpus montanus | 1.3 |
| Purshia tridentata | 1.5 |

PELLET GROUP DATA --

Management unit 10R, Study no: 15

| Type | Quadrat Frequency | | |
|--------|-------------------|-----|-----|
| | '98 | '00 | '05 |
| Rabbit | 6 | 52 | 45 |
| Elk | 30 | 29 | 31 |
| Deer | 14 | 15 | 16 |
| Cattle | 1 | - | - |

| Days use per acre (ha) | | |
|------------------------|---------|----------|
| '98 | '00 | '05 |
| - | - | - |
| 78 (193) | 36 (90) | 62 (154) |
| 11 (28) | 15 (38) | 37 (91) |
| 6 (14) | - | - |

BROWSE CHARACTERISTICS --

Management unit 10R, Study no: 15

| | | 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>Amelanchier utahensis</i> | | | | | | | | | | | | |
| 98 | 40 | - | 40 | - | - | - | 0 | 0 | - | - | 0 | -/- |
| 00 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | -/- |
| 05 | 20 | - | 20 | - | - | - | 0 | 0 | - | - | 0 | 8/13 |
| <i>Artemisia frigida</i> | | | | | | | | | | | | |
| 98 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | -/- |
| 00 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | -/- |
| 05 | 0 | - | - | - | - | - | 0 | 0 | - | - | 0 | 4/11 |
| <i>Artemisia tridentata vaseyana</i> | | | | | | | | | | | | |
| 98 | 1480 | 180 | 680 | 800 | - | - | 7 | 0 | 0 | - | 0 | 30/43 |
| 00 | 1080 | 60 | 420 | 620 | 40 | - | 9 | 0 | 4 | - | 0 | 23/33 |
| 05 | 1280 | 200 | 360 | 820 | 100 | 20 | 27 | 0 | 8 | 3 | 3 | 20/29 |
| <i>Cercocarpus montanus</i> | | | | | | | | | | | | |
| 98 | 260 | - | - | 260 | - | 20 | 38 | 62 | 0 | - | 0 | 52/50 |
| 00 | 60 | - | - | 60 | - | 20 | 100 | 0 | 0 | - | 0 | 54/54 |
| 05 | 180 | - | 20 | 100 | 60 | 20 | 22 | 56 | 33 | - | 0 | 41/40 |
| <i>Chrysothamnus nauseosus hololeucus</i> | | | | | | | | | | | | |
| 98 | 40 | - | 20 | 20 | - | - | 0 | 0 | 0 | - | 0 | 17/19 |
| 00 | 40 | - | - | 20 | 20 | - | 0 | 0 | 50 | 50 | 50 | 17/19 |
| 05 | 60 | - | - | 40 | 20 | - | 0 | 0 | 33 | - | 0 | 17/26 |
| <i>Chrysothamnus viscidiflorus viscidiflorus</i> | | | | | | | | | | | | |
| 98 | 40 | - | - | 40 | - | - | 0 | 0 | 0 | - | 0 | 19/20 |
| 00 | 40 | - | - | 20 | 20 | - | 100 | 0 | 50 | - | 0 | 11/14 |
| 05 | 60 | - | - | 60 | - | - | 0 | 0 | 0 | - | 0 | 11/10 |

| | | 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) |
| Juniperus osteosperma | | | | | | | | | | | | |
| 98 | 160 | - | 120 | 20 | 20 | - | 0 | 13 | 13 | - | 13 | -/- |
| 00 | 180 | - | 120 | 40 | 20 | 20 | 0 | 0 | 11 | - | 0 | -/- |
| 05 | 160 | - | - | 100 | 60 | - | 0 | 0 | 38 | 13 | 25 | -/- |
| Opuntia fragilis | | | | | | | | | | | | |
| 98 | 40 | - | - | 40 | - | - | 0 | 0 | 0 | - | 0 | 5/29 |
| 00 | 60 | - | - | 60 | - | - | 0 | 0 | 0 | - | 0 | 3/13 |
| 05 | 420 | - | 60 | 160 | 200 | - | 0 | 0 | 48 | 48 | 48 | 3/9 |
| Pinus edulis | | | | | | | | | | | | |
| 98 | 140 | - | 80 | 60 | - | - | 0 | 0 | - | - | 14 | -/- |
| 00 | 160 | - | 120 | 40 | - | 60 | 0 | 0 | - | - | 0 | -/- |
| 05 | 100 | - | 20 | 80 | - | 20 | 0 | 0 | - | - | 0 | -/- |
| Purshia tridentata | | | | | | | | | | | | |
| 98 | 980 | 40 | 260 | 720 | - | - | 37 | 18 | 0 | - | 0 | 23/58 |
| 00 | 800 | - | 120 | 580 | 100 | - | 15 | 65 | 13 | 3 | 3 | 18/51 |
| 05 | 980 | - | 220 | 460 | 300 | 40 | 31 | 45 | 31 | 14 | 14 | 15/33 |
| Symphoricarpos oreophilus | | | | | | | | | | | | |
| 98 | 40 | - | - | 40 | - | - | 0 | 0 | 0 | - | 0 | 44/68 |
| 00 | 20 | - | - | - | 20 | - | 0 | 0 | 100 | 100 | 100 | 27/59 |
| 05 | 20 | - | - | 20 | - | - | 0 | 0 | 0 | - | 0 | 19/31 |