University of Nevada, Reno

Reducing fuel load of key cheatgrass (*Bromus tectorum* L.) dominated range sites by the use of fall cattle grazing.

A thesis submitted in partial fulfillment of the

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by

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ABSTRACT

Reducing cheatgrass fuels may be able to decrease the intensity or frequency of fires in the Great Basin. Using spring cattle grazing techniques to reduce cheatgrass fuels at large enough scales or high enough concentrations is impractical. However, cattle can be easily concentrated on cheatgrass during the fall, effectively reducing the amount of total fuel available during the next fire season. The effects of ranch-scale fall grazing of cheatgrass by cattle on fuel reduction, perennial grass growth, and cattle performance were examined. Yearly production and nutritional content are important to know before grazing. Cheatgrass nutrient content (7% protein and 61.5% TDN), during the dry years of 2007 & 2008, were adequate for the cows' nutritional needs. Fall grazing removed significant amounts of cheatgrass biomass during both 2007 and 2008. We found that cheatgrass was reduced without affecting the cattle's performance, or harming the perennial plants present, at least in the short-term. The cover of two perennial grasses even increased by the third treatment year, but there was a reduction in the seedbank of Sandberg bluegrass in both 2007 and 2008. Cattle preferred cheatgrass over perennials: 78.5% of cheatgrass biomass and 60.5% of perennial grass biomass was removed over the two year study period. After the second fall grazing period, cheatgrass density, cover and litter declined significantly under grazing whereas perennial density and cover were unaffected. Seed density of cheatgrass was significantly higher in the control treatment in 2007, but in 2008 the cheatgrass seed density declined in the grazed treatment. Cattle gained 1.2 and 1.75 pounds per head per day in

2007 & 2008 respectively, and increased body condition by one quarter of a score in 2007, and four tenths of a score in 2008.

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INTRODUCTION

Cheatgrass (*Bromus tectorum* L.) is present in every area of the United States except for the coastal southeast (Young et al. 1987) and, as documented by Monsen (1994) and Pellant and Hall (1994), continues to increase in acreage. This marks cheatgrass as a significant part of the ecology of the United States. Cheatgrass was also a major fuel contributor to the six most significant wildfire seasons since 1960 all of which have occurred since 2000 (NIFC 2008).

Recent analysis indicates that the sagebrush steppe ecosystem occupies only 53.8 million hectares of its original potential of 73 million hectares (Connelly et al. 2004). Knapp (1996) estimated cheatgrass dominates 2.7 million hectares of the Great Basin. The Bureau of Land Management (BLM 1991) estimates that of the lands it manages, 3.6 million hectares contain cheatgrass as the dominate understory, and has the potential to dominate 16.2 million acres of BLM land in the future (BLM 1991). The National Science and Technology Center mapped 31.5 million acres of cheatgrass in the intermountain west during the year 2000 (Menakis et al. 2003).

Young et al. (1987) indicate cheatgrass dominates landscapes because of several adaptations. Cheatgrass is a winter annual that competes with other perennial plants by depleting soil moisture (Evans et al. 1970), producing prolific amounts of seed, (up to 28.2 million seeds per hectare Hull and Pechanec 1947; Hulbert 1955) and germinating readily in the fall or spring, ensuring that annual recruitment is maintained (Mack and Pyke 1983). Young et al. (1969) describe large amounts of cheatgrass seed carry over from year to year.

Young et al. (1987) identified two significant points about cheatgrass reproduction. First, a single plant has the potential to produce enough tillers to easily generate 5000 seeds if the plant has little competition. Second, at a concentration of 4 plants ft^{-2}, cheatgrass can easily out-compete crested wheatgrass seedlings and can displace native bunchgrass seedlings even more readily. Young and Evans (1973) observed cheatgrass will easily dominate sagebrush steppe sites after sagebrush removal by fire or other means as long as there is a cheatgrass seed source. Beginning in the 1930s, Piemeisel studied cheatgrass invasion into the cropland of abandoned fields cleared from big sagebrush in the 1930s and concluded that simple plant succession on much of the millions of acres of sagebrush rangelands was past a threshold of repair by natural plant succession (Piemeisel 1938). Laycock (1991) discussed the state and transition model under which sagebrush areas converted to cheatgrass could never return to a climax condition without some form of rehabilitation treatment. In fact, Young and Clements (2007) indicate “no one has been consistently successful with large scale artificial seeding of native perennial grasses in the face of competition from cheatgrass” (p. 18). Even if livestock grazing is excluded, successional changes in a degraded cheatgrass system may well exceed a century (Young et al. 1987).

Cheatgrass attributes make it an ideal fine fuel. Cheatgrass matures four to six weeks earlier in the growing season and remains flammable longer in the fall than native perennial species (Platt and Jackman 1946). Cheatgrass is a fine textured, abundant plant with a short growth period that makes it more likely to

ignite than perennials. Cheatgrass also provides greater fuel continuity enabling fire to carry through communities (Pellant 1990).

Each time a sagebrush community reburns, cheatgrass increases its dominance, leading to a downward spiral of concentric cycles of degradation (Young et al. 1987). The result is a normal mosaic burn pattern replaced by large, contiguous burn areas dominated by cheatgrass (Peters and Bunting 1994). Traditionally, the natural fire cycle for the sagebrush steppe is estimated to have been 30-100 years. It has now decreased to as little as three to five years in cheatgrass invaded areas (Whisenant 1990; Peters and Bunting 1994).

Spring livestock grazing has been investigated as a method to help control cheatgrass proliferation. Piemeisel (1938) described a reduction of cheatgrass cover after spring grazing. Mulch accumulations, density, growth and seed production were all found to decline by Mosley (1996) and Valentine and Stevens (1994). Clipping cheatgrass, to simulate grazing, reduced density and cheatgrass biomass (Tausch et al. 1994). If a cheatgrass population does not produce viable seed for two or more consecutive seasons, the population will thin dramatically, leaving scattered stands of cheatgrass (Finnerty and Klingman 1962). Call et al. (2007) discovered several relationships between grazing cheatgrass and fire: 1) Intensive grazing in May can reduce cheatgrass fire hazard, particularly flame length; 2) A combination of May grazing, followed by October prescribed burning followed by an additional grazing in May the following year reduced the fire hazard considerably more than one grazing episode. Independently, grazing and burning reduced the cheatgrass seedbank; however

combined grazing and burning provided the greatest fire hazard reduction. The Murphy Wildland Fire Grazing and Fuel Assessment Team (Launchbaugh et al. 2008) reported that unless extreme weather conditions were present, cheatgrass grazing may produce mosaic burn pattern fires by reducing the intensity and rate of fire spread. The fuels created by dead grass and small twigs are called “1-hour time lag” (1-htl) fuels in fire models. These 1-htl fuels were modified to simulate the effect of grazing to reduce carryover of residual dormant grass and forbs from one year to the next. The team recommended a carefully designed fuels reduction demonstration project aimed at reducing fuel load of key areas thereby changing fire behavior. The team found, under relatively dry conditions of 10 percent DFM, extreme fire behavior (that is, fire line intensity greater than 100 BTU/ft/sec) was predicted until fine fuel load was reduced to less than 200 lbs ac^{-1}. Thus, the rate of spread and fire line intensity of a wildfire may be reduced if grazing or lower-than-normal precipitation occurred in years preceding a fire, reducing the carryover of fine fuels from one year to the next.

While spring grazing has shown some success in controlling cheatgrass and fuels reduction, three significant problems occur with spring grazing. First, cheatgrass production and grazing readiness vary from year to year. The fast growing annual nature of cheatgrass makes it highly dependent on both the amount and timing of moisture (Stewart and Young 1939). Annual standing crop varies up to tenfold from 3,879 kg ha^{-1} (wet year) and 405 kg ha^{-1} (dry year) (Hull and Pechanec 1947), while introduced wheatgrass production differences over the same period were less significant at 2,771 and 2,771 kg ha^{-1}. These

significant production differences, which lead to dramatic changes in available grazing forage, is untenable for most livestock operations because of the necessity to maintain stable livestock numbers and the inability to plan on a consistent forage base (Young et al. 1987).

Second, the spring grazing window is also a short duration moving target. As cheatgrass matures from the growth stage, it begins to turn purple as it sets seed, loses palatability and increases the danger of mechanical injury to livestock from seed heads (Hulbert 1955). Cheatgrass must be grazed before seed set to help control seed production (Hulbert 1955; Pellant 1990). In order to ensure the best measure of control, cheatgrass should be grazed two consecutive years, two or three times each season since it is able to regrow and produce new seed heads three to four weeks after the first defoliation (Hulbert 1955).

Lastly, perennial grasses may be at risk. Perennial grasses present in spring grazed cheatgrass systems must be monitored closely to determine grazing effects (Mosley 1996). Daubenmire (1940) noted that in order to suppress cheatgrass seed production, grazing pressure has to be heavy enough to eliminate nearly all seed, or scattered plants will re-populate the area. It is easier to graze stands of cheatgrass that are essentially monocultures than in areas where desirable perennials are present and need to be protected (Mosley and Roselle 2006). Where perennials are present, cattle can graze on cheatgrass at the dough seed stage thereby helping perennials by reducing cheatgrass competition through reduced seed production. In areas where bluebunch wheatgrass (*Pseudoroegneria spicata* (Pursh) A. Löve) is present,

short duration cheatgrass grazing before bluebunch reaches the boot stage, which is coincident with cheatgrass shoot and flower development, helps control cheatgrass (Miller et al. 1986). "The fact that excessive spring grazing both enhances the presence and biologically suppresses the abundance of cheatgrass is one of the most misunderstood aspects of the biology of this grass" (p. 531) (Young and Allen 1997)

Fall or winter grazing cheatgrass is not a new idea. DeFlon (1986) and Tipton (1994) both recommended fall or winter cheatgrass grazing and also indicated that it could be used as a fuels reduction tool. Additionally, two of the recommendations from the Great Basin Wildfire Symposium (Miller and Narayanan 2008) spoke specifically to cheatgrass grazing for fuels reduction. The report indicated that current knowledge must be integrated into a large-scale vegetation management and site rehabilitation demonstration project. This project must utilize cattle, sheep and/or goats in targeted areas to provide an economic and feasible way of reducing fire fuel loads, while simultaneously controlling weeds and fostering nutrient cycling. The authors also recommended strategically located fuel breaks should be constructed to break up the fuel continuity and increase the probability of safely suppressing an ignition before it becomes a mega-fire.

Litter and mulch layers play an important role in cheatgrass retention and recruitment. Evans and Young (1970) reported that the number of cheatgrass plants under litter was three times more than on bare ground. Evans and Young (1970) also reported plant mulch in large amounts favors cheatgrass

establishment. By reducing the amount of cheatgrass litter with cattle grazing, fire hazard can be reduced (Young and Tipton 1990). Litter build up on an ungrazed or lightly grazed cheatgrass area equals two or more years of litter resulting in ideal conditions for fire (Knapp 1998). Pellant (1990) also reported that cheatgrass establishment was positively correlated to litter cover, and the fire hazard of cheatgrass sites could be reduced through cattle grazing cheatgrass and reducing litter.

Hull and Pechanec (1947) noted seedling establishment of perennials could be improved by reducing mulch accumulations through grazing cheatgrass during the fall or winter. Grazing in the fall or winter should be conducted when the ground is dry, firm or frozen to prevent mechanical damage to desirable species. This grazing prescription will help perennial competition with cheatgrass (Mosley 1996).

Young et al. (1987) concluded we do not have an abundance of literature on the subject of fall or winter cheatgrass nutritional quality. Care has to be taken during fall cheatgrass grazing to ensure nutritional needs of the cattle are met. Murray et al. (1978) described cheatgrass nutrition declining rapidly as cheatgrass matures. Cook (1952) detailed cheatgrass crude protein levels during fall and winter at 3.5%. Ganskopp and Bohnert (2001) compared cheatgrass nutritional content to six other Great Basin species. During a year of abundant soil moisture, CP levels for all species were deficient by the end of July and stayed deficient through November. They described deficient as being below 7.5% CP because 7.5% CP is adequate maintenance threshold level for many

domestic herbivores (NRC 1978, 1981, 1984). During a dry year (86% of average annual precipitation), shallow rooted grasses such as Sandberg bluegrass (*Poa secunda* J Presl.), squirreltail (*Elymus elymoides* [Raf.] Swezey), and cheatgrass quickly responded to adequate moisture received in the summer or fall and maintain a higher nutritional plane for twice as long as deep rooted grasses. During years of adequate soil moisture, all grasses were deficient in protein by late July. Cattle dry matter intake decreased much more on cheatgrass during years of high moisture than years with inadequate moisture. NRC (2000) lists requirements for a 544-590 Kg (1200-1300 lb) dry cow in the 2nd trimester of gestation as 48.8% TDN or 4.6 kg (10.1 pounds) of TDN per head per day and 6.9% CP or 0.64 kg (1.4 lbs) head^{-1} day^{-1} CP. Since cattle will utilize a pasture more evenly by strategic placement of protein supplement (Ares, 1953), the supplement was fed in tubs spaced across the landscape to encourage even utilization of the pasture. Younger cows or yearling replacement heifers require a higher plane of nutrition than mature body condition 5 or better cows (NRC 2000). Inadequate energy intake is the primary cause of reduced performance in cattle on forage diets. Protein and energy have a direct relationship and if forage contains less than 7% crude protein, feeding a protein supplement will increase protein and energy status of cattle by increasing total forage intake and digestibility (Canton et al. 1988; Mathis, 2000; Paterson et al., 1992).

Additionally, cheatgrass should be grazed in the fall only after seed dihesence since consuming cheatgrass herbage with sharp awned seeds intact

can greatly increase the incidence of mechanical injury and infection of the mouth and eyes of cattle. Cheatgrass seed heads are also subject to the poisonous fungus ergot, which can be toxic to livestock, which can be toxic to livestock. Down or lodged cheatgrass stands are particularly sensitive to ergot (Mosley 1996).

In order to improve our understanding of the effect of fall grazing as a fuel reduction tool and fall grazing effects on perennial plant communities, we conducted an experiment with these specific objectives: 1) determine the effects of large scale fall grazing of cheatgrass by cattle on fuel reduction; 2) determine the effects on cattle condition and performance; 3) determine potential plant community changes.

Three specific hypotheses were addressed: First, fall grazing of cheatgrass will reduce the abundance (density, cover and biomass) of cheatgrass fuels. Second, grazing cheatgrass in the fall will not reduce the abundance (density, cover, and production) of perennial species in grazed areas. Third, cattle will maintain or slightly gain body condition and weight while grazing senesced cheatgrass in the fall.

MATERIALS AND METHODS

Study Area

The project was located on the University of Nevada-Reno Gund ranch approximately 50 miles northeast of Austin, Nevada along the western base of the Simpson Park Mountain Range (Lat 39º53'N; Long 116º35'11.9 5" W). The total area consisted of 607 hectares (1500 ac) and grazing treatments were

applied to an area of 285 hectares (705 ac) in size (Figure 1). The site was selected for cheatgrass continuity, and because it lies at the approach to an upland native perennial site that burned in 1999. The entire area has the potential for entering a cheatgrass-fire cycle (Pickford1932). Ecological sites present include 56% Loamy 8-10 pz and 44% Loamy 5-8 pz. Soils are Tulase bubus mcconnel soil type, Zineb gravelly loam, and Perwic variant, described as Coarse-silty, mixed (calcareous), mesic Durorthidic Xeric Torriorthents. Elevation varied from 1615 - 1829 m (5300 - 6000 ft). Slope was generally less than 5% and the aspect was predominately to the west. Records show a thirty-five year annual precipitation average of 10.7 inches (WRCC 2008). Precipitation in 2006 was 91.7% of normal while the years 2007 and 2008 were drought years (SRM 1974) measuring 71.4%, and 49% of normal respectively (Figure 2).

Dominant vegetation consisted primarily of cheatgrass; crested wheatgrass (*Agropyron cristatum* Nutt.); needle and thread (*Stipa comata* Trin. & Rupr.); Sandberg bluegrass (*Poa secunda* J Presl.); Indian ricegrass (*Oryzopsis hymenoides* [Roem. & Schult.] Ricker); redstem filaree (*Erodium cicutarium* [L.] L'Hér. ex Aiton); Russian thistle (*Salsola iberica* Sennen); burr buttercup (*Ranunculus testiculatus* Crantz); blue mustard (*Chorispora tenella* [Pall.] DC.); tansy mustard (*Descurainia* Webb & Bethel) and other mustards (*Descurania* spp.). The site supported rubber rabbitbrush (*Chrysothamnus nauseousus* [Pall.] Britt.); fourwing saltbush (*Atriplex canescens* [Pursh] Nutt.); black sagebrush (*Artemisia nova* A. Nelson); Wyoming sagebrush (*Artemisia tridentata* Nutt. sbsp. *wyomingensis* Beetle & Young); squirreltail (*Elymus elymoides* [Raf.] Swezey);

scarlet globemallow (*Sphaeralcea coccinea* [Nutt.] Rydb.) and numerous annual forbs.

Study Design

The project was organized into a completely random design with 2 x 2 x 8 factorial design. Treatments included a grazing treatment applied during two treatment years (2007 and 2008). The grazing treatment was replicated in two treatment areas of 140 ha (250 ac), and there was one non-grazed treatment area (control). Response variables included plant cover, density, biomass, and seedbank density, measured across three transects 627 m in length within each treatment area. Cover, density, and biomass measurements were collected for eight species: cheatgrass, Indian rice grass, needleandthread, Sandberg bluegrass, crested wheatgrass, and annual forbs including mustards, redstem filaree, and Russian thistle.

Since it is to replicate grazing treatments in space and time at a scale necessary to make inferences for Great Basin applications, we chose to utilize large areas with extended transects that could be perceived as pseudo-replication. However, we believe the size of these treatment areas was large enough to minimize independence concerns, and transects 627 m in length were located 120 meters apart.

The experiment initially planned for two separate fall grazing cattle grazing treatments, with one treatment area slated to receive additional spring sheep grazing when cheatgrass seeds reached the dough stage. However, the lack of cheatgrass productivity in year three precluded the sheep grazing treatment.

Thus, both grazing treatment areas were the same, resulting in a larger grazing treatment area, and one control area.

Grazing Treatments

Cattle grazed 269, 297 and 155 animal unit months (AUM's) during 2006, 2007 and 2008, respectively. These AUM's consisted of 185 cows and bulls grazing 45 days in 2006, 240 cows and bulls grazing 37 days 2007, and 186 cows and bulls grazing 25 days during 2008. Treatment dates were Oct 31- Dec 14, Sept 27- Nov 3, and Sept 9 – Nov 4 during 2006, 2007 and 2008, respectively.

Prior to cattle grazing in September of 2007 and 2008, a subsample of 25% of the cattle were weighed and given a body condition score (BCS) (1 = emaciated to 9 = obese; (Richards et al. 1986). Both measurements were repeated at the end of grazing (October 2007 and 2008). Only cattle and bulls greater than or equal to five years of age with a BCS 5 or better in their 2nd trimester of gestation were used. Based on the requirements for cows during their second trimester of gestation (NRC 2000), the cheatgrass nutritional assay in 2006 indicated cheatgrass was deficient in crude protein (3.4%) and TDN (49.6%). Since these values matched the expected values found in literature, we determined that cows required protein supplementation. A 14% all natural crude protein liquid supplement was fed free choice, formulated to regulate consumption at 1 lb head^{-1} day^{-1}. The supplement was fed in tubs spaced across the landscape to encourage even utilization of the pasture. Protein

supplementation was continued in 2007 and 2008 based on the same information.

Sampling Procedures

Transects were 627 m in length, organized to adequately cover the entire treatment area. After sample adequacy calculations were completed, the required number of samples per transect were divided by the length of the transects to yield sample intervals of 83.7 m (274 ft) for density, biomass and seedbank density and 41.8 m (137 ft) for vegetation cover. Transects were marked using GPS points to aid in relocation.

Measurements for cover, density, and pregraze biomass were collected after plants had reached peak production. Cover was measured in July of 2007 and 2008 using a 10 point point-frame at 15 intervals along each transect (Levy and Madden 1933). Density and frequency were measured for both cheatgrass and perennial grasses before each fall grazing period by counting plants in a 0.89 m^2 round quadrat at 7 stations along each transect.

Pre-graze clippings were conducted in August 2007 and 2008 after cheatgrass plants had dropped seed. Cheatgrass and perennial grass biomass production was determined by clipping the plant material from a 0.89 m^2 round quadrat at seven points along each transect. The clippings were separated by species, transported to University of Nevada-Reno, oven dried at 60 °C for 48 hours and weighed (Bonham 1989; Malone 1968). Aboveground biomass was calculated as kg ha^{-1}. In September 2007, perennial grasses were all mature and showed no green except for crested wheatgrass, which showed small amounts of

green vegetation at clipping in 2007 only. Post-graze clippings were completed in October 2007 and 2008. The initial grazing year (2006) only pre- and post-grazing biomass data was collected from 12 random quadrats.

After weighing, plant material from all clipped quadrats (both pre- and post- graze for both 2007 and 2008) were pooled by grazing area and grazing treatment. The samples were sent to Stukenholtz Laboratory, Inc (Twin Falls, ID) for wet chemistry nutritional analysis including crude protein (CP), acid detergent fiber (ADF), neutral detergent fiber (NDF), ash, dry matter, total digestible nutrients (TDN), nitrate-N, phosphorus, potassium, calcium, magnesium, sulfur, zinc, iron, copper, manganese, boron, and sodium. All results are reported on a dry matter basis.

A soil seedbank bioassay was conducted in September of 2007 and 2008. Soil cores 7.6 cm X 12.7 cm X 5.1 cm deep were obtained along each transect at 10 stations per transect at 125.5 m (411 ft) intervals. Cores were taken prior to any treatment and after seed dehiscence, so samples include both the carryover seedbank as well as current-year seed production. A seedling emergence technique was used to determine seedbank composition (Ball and Miller 1989; Forcella 1992). Soil from each plot was mixed with steam-sterilized sand (250 cc) and placed into 25 by 25 cm greenhouse flats. Flats were placed in the greenhouse at 18° ± 5 C under natural sunlight and were watered as needed. Emergence was monitored weekly by counting and carefully removing emerged seedlings of each species. After one month, soils in each flat were thoroughly mixed, then monitored for an additional month.

Statistical Methods

All analyses were conducted with JMP version 7.0.2 (SAS Institute, Cary, North Carolina), and all results are presented as means and standard errors. Percent cover values were arcsine transformed for analysis, but reported as percent. Cover, biomass, density and seedbank density were analyzed using ANOVA. Because there were significant species x year x treatment interactions or species x treatment and species x year interactions for all responses, a separate ANOVA was run for each species for the response variables of density, biomass, and seedbank density, and by cover category for the cover response variable. Means comparisons were analyzed using Tukey HSD or Student's *t* tests.

Cover categories included: bare ground, litter, cheatgrass, Sandberg bluegrass, crested wheatgrass, needleandthread, and an annual forb functional group that included tansy mustard, blue mustard, burr buttercup and Russian thistle. Biomass was analyzed pre- and post- grazing to determine utilization.

RESULTS

Cattle performance

Cattle gained significant amounts of weight for both treatment years (Table 1). In 2007, prior to grazing, cattle weighed an average of 534.8 kg (1178 ± 8.3 pounds per head) and gained 19.5 kg (43 pounds) to weigh 558 kg (1221 ± 8.33 pounds) at the end of the grazing period. This provided an average daily gain of 0.55 kg per day (1.2 lbs day^{-1}). No cow lost condition and average BCS increased from (5.5 ± 0.1) to (5.8 ± 0.1). During 2008 cattle gained (19.5 kg) 43

total pounds at and average of 1.74 lbs day^{-1}. The cattle increased body condition score from a pregraze BCS of (5.6 ± 0.1) to and ending BCS of (6.0 ± 0.1) (Table 1).

Plant Responses

After one fall grazing treatment (2006), the aggregate plant community cover consisted of 19.5% cheatgrass, 4.9% perennial grasses, 2.1% annual forbs, 17.9% bare ground, and 55.6% litter.

The two study years had substantial differences in rainfall totals (Figure 2). Species had different responses to the grazing treatments in different years. A three-way interaction was detected for cover ($P < 0.0001$); a two-way species X year interaction was detected for biomass production ($P < 0 .0001$), and a species x grazing treatment and species x year interaction was found for density ($P = 0.001$ and $P < 0.0001$). Therefore, results are reported separately for each species and cover class. Additionally, there was a significant species x year x grazing treatment interaction in the seedbank assessment ($P = .03$).

Cheatgrass

Grazing removed significant amounts of cheatgrass biomass during both 2007 and 2008 (Figure 3). Cheatgrass production measured 556.6 kg ha^{-1} (497 lbs ac^{-1}) in 2006. At the end of the grazing period, residual fuels were 103 kg ha^{-1} (92 lbs ac^{-1}), for a reduction of 453.6 kg ha^{-1} (405 lbs ac^{-1}) or 81.5% utilization. Pre-graze cheatgrass biomass in 2007 was 221.8 kg ha^{-1} (198 ± 29 lbs ac^{-1}). At the end of the 2007 grazing period, residual fuels were 43.6 kg ha^{-1} (38.9 ± 8.7 lbs ac^{-1}), a reduction of 178.2 kg ha^{-1} (159 lbs ac^{-1}) or 80.4% utilization (Figure 4

and 5). During 2008, pre-graze cheatgrass biomass was 75.4 kg ha^{-1} (67 ± 12.7 lbs ac^{-1}). At the end of the test period, residual fuels were 16.2 kg ha^{-1} (14.5 ± 8.7 lbs ac^{-1}), a reduction of 58.7 kg ha^{-1} (52.5 lbs ac^{-1}) or 78.4% utilization (Figure 4 and 5).

After the second fall grazing treatment (2008), cheatgrass cover in grazed areas was significantly less than the control area (15% ± 1.6 vs. 22.2% ± 2.2, respectively) (Table 3, Figure 6). In 2007, after one fall grazing treatment, cheatgrass densities were not different between grazed and ungrazed areas (Table 4, Figure 7). However, during 2008, cheatgrass density was significantly less in ungrazed (535 ± 99.9 plants m^2) than grazed areas (332 ± 70.6 plants m^2) (Table 4, Figure 7). Cheatgrass seedbank density was higher in the 2007 grazed treatment compared to control and reversed in 2008, with lower density in the grazed treatment than in the control (Table 5, Figure 8).

Perennial grasses

In 2007, and 2008 cattle removed 100% and 92.8% of the biomass of needleandthread making it the most preferred grass (Figure 5). Crested wheatgrass was the least preferred grass, with only 52.3% and 43.7% removal. Perennial grass cover, density and seedbank density were not different over time in either the grazed or control areas (Figures 9, 10, 11 respectively).

Annuals and litter

There were significantly more annual forbs in grazed areas during 2007 (107.7 ± 15.8), but this result was not observed during 2008 (13.6 ± 22.3) (Table 4). If we look individually at the species composing annual forbs, Russian thistle

increased substantially (23.5 ± 4.2) compared to control (3.5 ± 4.2) during 2008 (Figure 12). After one grazing treatment, litter cover was significantly higher in the ungrazed control (62.7% ± 2.2) compared to grazed area (54.1% ± 1.6) in 2007 but declined to a level significantly lower than in the control area (47.8 ± 2.2) compared to grazed area (57.8 ± 1.6) in 2008, while the grazed area litter cover remained unchanged over the two years (Figure 13).

Plant nutrition analysis

Cheatgrass nutritional quality varied considerably with time. Cheatgrass crude protein was considerably lower (P = 0.02) in 2006 (3.37% ± 0.5 CP) than 2007 (7.0% ± 0.3 CP) or 2008 (7.8% ± 0.6 CP). However, 2007 cheatgrass CP did not differ from 2008 (Figure 14). Cheatgrass TDN followed the same pattern as crude protein: 2006 = (45.9% ± 2.1 TDN), 2007 (60.77% ± 1.47 TDN), and 2008 (56.8% ± 2.93 TDN) (Figure 15). No differences were detected between years for CP or TDN for the perennial grass species crested wheatgrass, needleandthread, and Sandberg bluegrass.

DISCUSSION

These results suggest that fall grazing on cheatgrass stands similar to the Gund ranch site will reduce fuel load. We documented dramatic reductions of cheatgrass fuels from livestock grazing on a relatively large pasture scale. According to the BEHAVE Plus fire model and the Rothermel equation (Rothermel 1972; 1983), in each year (2006, 2007, and 2008) residual fuels (92, 39 and 15 lbs ac^{-1}, respectively) were below the level (200 lbs ac^{-1}) at which all firefighting methods can be employed.

Cheatgrass production varies and may be difficult to predict from year to year, because it is highly dependent on the amount and temporal distribution of moisture, however this difference in production may be no greater than that of native perennial grasses as long as there is adequate spring moisture (Young and Allen 1997). Forage production is especially reduced when cheatgrass germinates in spring rather than fall (Anderson 1990). All three of our production years were below average in precipitation and received no fall moisture to germinate cheatgrass. Even the moisture received in the fall of 2008 did not germinate cheatgrass until well into November. Ideally, during the third year of this study, a wet year with cheatgrass germination in the fall would have occurred in order to allow us to assess how significant a reduction of cover, density and production would occur.

Cattle gained weight during this study in contrast to the findings of other investigators (Ganskopp and Bohnert 2001; Klemmedson and Smith 1964) and leads us to believe that cheatgrass nutrition needs more evaluation. We speculate that the marked difference in nutritional content for both CP and TDN between 2006 and the drought years of 2007 and 2008, was due to fine cheatgrass stems and quick short growth during drought years. Ganskopp and Bohnert (2001) speculated that when cool season grass growth begins with inadequate moisture, tillers become quiescent as moisture is exhausted and regrowth can begin if adequate moisture happens later in the year. This assumes a late summer or fall green up, however cheatgrass on our sites did not green up during the summer or fall of 2007 or 2008.

Additionally, a reduction in cheatgrass cover and seedbank density was documented after only one grazing treatment with additional reduction after two fall grazing treatments. Cheatgrass density did not decrease until after the second grazing treatment, leading us to conclude that at least two grazing treatments are necessary to decrease cheatgrass density. This is validated by Hulbert (1955) who concluded cheatgrass should be grazed two consecutive years to affect the best control. It is important to note that cheatgrass seedbank populations declined in our study without removing seedheads via a spring grazing treatment. We believe the cheatgrass seedbank reduction was accomplished through cattle consuming residual seeds contained in the duff and litter in the grazed portion. However this reduction may be of little value since the density of the grazed cheatgrass seedbank level of 185 plants ft^{-2} is far above the cheatgrass threshold concentration of 4 plants ft^{-2}, reported by Young et al. (1987) that can easily out-compete crested wheatgrass seedlings and can displace native bunchgrass seedlings. A counter argument could draw on Finnerty and Klingman (1962) who described cheatgrass populations crashing after seedhead removal for two consecutive years. The higher cheatgrass seedbank levels documented during 2007 in the grazed area versus control lead us to believe the grazed area initially contained a higher 0seedbank density than the control area even though our density and cover of cheatgrass was similar.

We did not anticipate the litter cover decline in the ungrazed area between 2007 and 2008. While above ground production of all species was lower in 2008, it is counterintuitive that litter should decrease under a no grazing treatment. Two

possibilities arise. The first possibility is sampling error which seems to be ruled out by the low standard error (± 2.3) and by numerous evaluations of the point frame method originally introduced by Levy and Madden (1933). Second, the low above ground biomass production during the drought years of 2007 and 2008 provided very little litter deposit on the ground whereas in the grazed area, trampling of the plant portions not consumed by cattle kept the litter levels at a similar level.

Treatments had no measurable effects on perennial grass density or cover. Perennial plants may have actually benefited by reducing competition through reduction of cheatgrass density and litter (Hilbert et al.1981; Klemmedson and Smith 1964), and we saw the cover of crested wheatgrass and Sandberg bluegrass increase in grazed areas after the 2nd fall grazing treatment. Sandberg bluegrass seedbank was lower in the grazed area than in the control during both 2007 and 2008. Since the majority of 2008 Sandberg plants had not dropped seed by the seedbank assay in 2008, we expect this trend would reverse if measured in 2009. This effect should be monitored, however if it is real effect, the short term reduction in a long lived perennial seedbank (Sandberg) would seem to be offset by the benefits gained from a reduction in cheatgrass cover and density and increased Sandberg cover and perennial seed production in the grazed area. Whether herbivory benefits plants is still debated (Belsky 1985; Wise and Abrahamson 2007). Some concerns outlined by these researchers in their include: the lack of ability to measure negative effects on perennials due to their relative scarcity on the landscape; the short two year

monitoring period compared to the plants lifespan; the lack of below ground root production measurement. We also did not measure plant fitness, however visual appraisal indicated that crested wheatgrass, Sandberg bluegrass and needleandthread were more robust and produced more seed in the grazed area than in the control in 2008 even during a drought period. We would expect that perennials could use what little deeper stored soil moisture was available to greater advantage.

If we look at the combined use of all perennial grass species for 2007 and 2008 (61.8% and 59.2% utiliziation respectively), cattle peferred cheatgrass utilizing (80.4% and 78.4%) respectively for the same time period (Figure 4 and 5). However, this was primarily due to low preference for crested wheatgrass, especially in 2008. Other papers have also described a preference for cheatgrass in the fall or winter (Bishop et al. 2001; DeFlon 1986; Tipton 1994).

MANAGEMENT IMPLICATIONS

Under normal fall management scenario at our site cattle would be grazing salt desert shrub areas during the fall. Shrubs provide a digestible protein source, while carbohydrates provided by grass species supply the energy needed to meet the cattle's nutritional needs at this time of year and stage of production (DeFlon 1986). Plant nutritional analysis, coupled with the cattle gains in both 2007 and 2008 suggest, at least during drought years comparable to 2007 and 2008, cheatgrass would have met the nutritional needs of the cattle grazing it without protein supplementation. However, given the benefit of increased utilization, more even utilization, and the necessity of protein for low

quality forage digestion and utilization, protein supplementation was still warranted.

Using a fall-grazing system gives land managers knowledge about the resources at their disposal relatively early in the year. The amount of cheatgrass production available for fall grazing can be determined 3-4 months before grazing occurs, while the biomass available for springtime grazing cannot be predicted until cattle are well into the grazing season. In 2006 we grazed 185 head of cows for 44 days and removed 422 pounds per acre cheatgrass leaving 92 pounds per acre. Because the cattle were removed due to snow cover, rather than lack of forage, they did not remove all they could have, did not evenly utilize the pasture, and the perennials showed very little use. By determining production for 2007 at 198 pounds per acre (Figure 4) and the number of cows to be grazed at 240, we determined there would be 25 days of grazing available to remove cheatgrass to the same level as 2006. Because of favorable weather cattle were grazed 12 additional days removing 53 additional lbs $^{ac\text{-}1}$. Utilization was even across the pasture.

Based on this study we would recommend 1) to affect the largest degree of fuels reduction, cattle be grazed at least two years on each site before moving to a new target area. 2) Cattle can graze without losing condition to a level of 14 lbs acre^{-1}. 3) Sample both quantity and quality of cheatgrass to ensure cattle maintain condition and performance. Quantity of above ground biomass should be sampled to determine the length of time cheatgrass forage will be available for grazing. Nutritional quality of cheatgrass must be sampled to determine

supplementation level necessary. 4) When developing a fall grazing plan, be aware of the potential for the planned area to burn since fall grazing is only a spark away from no grazing. 5) Long term monitoring is necessary to determine changes in plant community attributes. In particular, monitoring should focus on: changes in weed cover and density; key perennial grasses and forbs cover and density; cheatgrass biomass pre and post grazing.

Future research questions should include: 1) What effect does annual precipitation have on cheatgrass nutrient content? 2) How long do the positive effects outlined in this study (reduced cover, density, and seedbank density of cheatgrass) persist? 3) What is the optimal number of yearly fall grazing repetitions 4) What would be the effect of combining fall grazing treatments with re-seeding and how would this affect perennial plant vigor? 5) How would a combination of fall grazing combined with spring grazing with sheep to remove seed heads at the dough stage, affect cheatgrass cover, density and seedbank density? 6) What are the long-term effects of fall grazing on perennial grasses?

In conclusion, these results indicate fall grazing will reduce the abundance (density, cover, biomass and seedbank density) of cheatgrass fuels while maintaining the abundance (density, cover, and above ground biomass) of perennial species in grazed areas. At least during dry years, cattle prefer cheatgrass and will gain weight grazing cheatgrass. All indications from this study lead to the conclusion that fall grazing of cheatgrass is a viable fuels reduction tool.

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Table 1. Cattle weight gains and Body Condition Scores (BCS) for 2007 & 2008.

	Cattle Weight				Frame Score	
	Pre graze	**Post Graze**	**Gain**	**Gain** head day^{-1}	**Pre graze**	**Post graze**
2007	534 Kg (1178 lbs)^{a}	555 Kg (1221 lbs)^{b}	19.5 Kg (43 lbs)	.54 Kg (1.2 lbs)	5.5^{A}	5.75^{B}
2008	541 Kg (1192 lbs)^{b}	561 Kg (1235.8 lbs)^{c}	19.5 Kg (43 lbs)	.79 Kg (1.74 lbs)	5.6^{B}	6^{C}

$^{ab \text{ or } AB}$ Means within a trait with different superscripts differ ($P < .05$) as determined Student's *t* test

Table 2. Animal unit months, cow numbers and days grazed in 2006, 2007, and 2008 on grazed treatment area.

Year	Total AUM's	Average cow numbers	Days Grazed
2006	269	183.2	44
2007	297	240.5	37
2008	155	186.4	25

Table 3. Treatment by year simple effects results for plant cover by category in 2007 and 2008. Values are means and standard errors of percent cover. Comparisons are within each category only, not between categories.

Category	Treatment	2007	2008
Cheatgrass	Grazed	20.8± 2.3 [a]	15 ± 2.3 [a]
	Control	20.0 ± 1.6 [a,b]	22.2 ± 1.6 [b]
Crested	Grazed	.88 ± 1.6	1.7 ± 1.6
	Control	1.3 ± 2.3	1.3 ± 2.3
Needle & Thread	Grazed	.33 ± 1.6	.33 ± 1.6
	Control	.43 ± 2.3	.90 ± 2.3
Sandberg	Grazed	3.5 ± 1.6 [a,b]	3.98 ± 1.6 [a]
	Control	2.9 ± 2.3 [a,b]	1.8 ± 2.3 [b]
Annual	Grazed	3.9 ± 1.6 [a]	2.5 ±1.6 [a,b]
	Control	1.5 ± 2.3 [b]	.67 ± 2.3 [b]
Litter	Grazed	54.1 ± 1.6 [a]	57.8 ± 1.6 [a,b]
	Control	62.7 ± 2.3 [b,c]	47.8 ± 2.3 [c]
Bare Ground	Grazed	8.2 ± 2.3	9.4 ± 2.3
	Control	5.4 ± 3.3	12.7 ± 3.3

[ab] Means within a category with different superscripts differ ($P < .05$) as determined Student's *t* test and reported only for significant differences.

Table 4. Treatment by year simple effects for plant density for 2007 and 2008. Values are means and standard errors of density in plants m^2. Comparison is for each species only, not between species.

Species	Treatment	2007	2008
Cheatgrass	Grazed	920.8±70.6 [a]	332.6 ± 70.6 [c]
	Control	1032.1± 99 [a]	535.2 ± 99.9 [b]
Crested	Grazed	.74± .23	.86± .23
	Control	.71± .32	1.6± .32
Needle & Thread	Grazed	.54 ± .14	.29 ± .14
	Control	0 ± .19	0 ± .19
Sandberg	Grazed	9.4 ± 1.6	8.7 ± 1.6
	Control	4.5 ± 2.2	8.2 ± 2.2
Annual	Grazed	107.7 ± 15.8 [a]	7.4 ± 15.8 [b]
	Control	13.6 ± 22.3 [b]	1.4 ± 22.3 [b]

[ab] Means within a species with different superscripts differ ($P < .05$) as determined by Tukey HSD and reported only for significant differences.

Table 5. Treatment by year by species simple effects for seedbank density. Values are means and standard errors of seedbank density in plants m^2. Comparison is for each species only, not between species.

Species	Category	2007	2008
Cheatgrass	Grazed	10700±370 [a]	2060 ± 370 [d]
	Control	8920± 520 [b]	3750 ± 520 [c]
Crested	Grazed	80± 370	170± 370
	Control	80 ± 520	90 ± 520
Needleandthread	Grazed	0.0 ± 370	40 ± 370
	Control	80 ± 520	0.0 ± 520
Sandberg	Grazed	900 ± 300 [b,c]	690 ± 370 [c]
	Control	2530 ± 520 [a]	2020 ± 520 [a,b]
Annual	Grazed	3000 ± 370 [a]	1470 ± 370 [b]
	Control	1960 ± 520 [a,b]	770 ± 520 [b]

[ab] Means within a species with different superscripts differ ($P < .05$) as determined by Student's *t* test and reported only for significant differences.

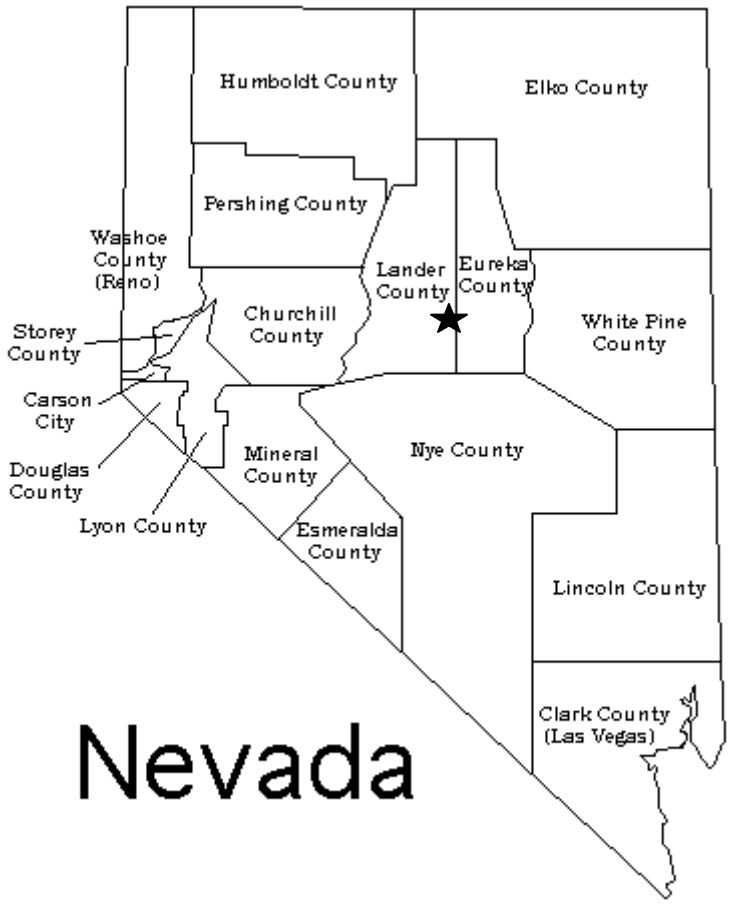


Figure 1. Study site location

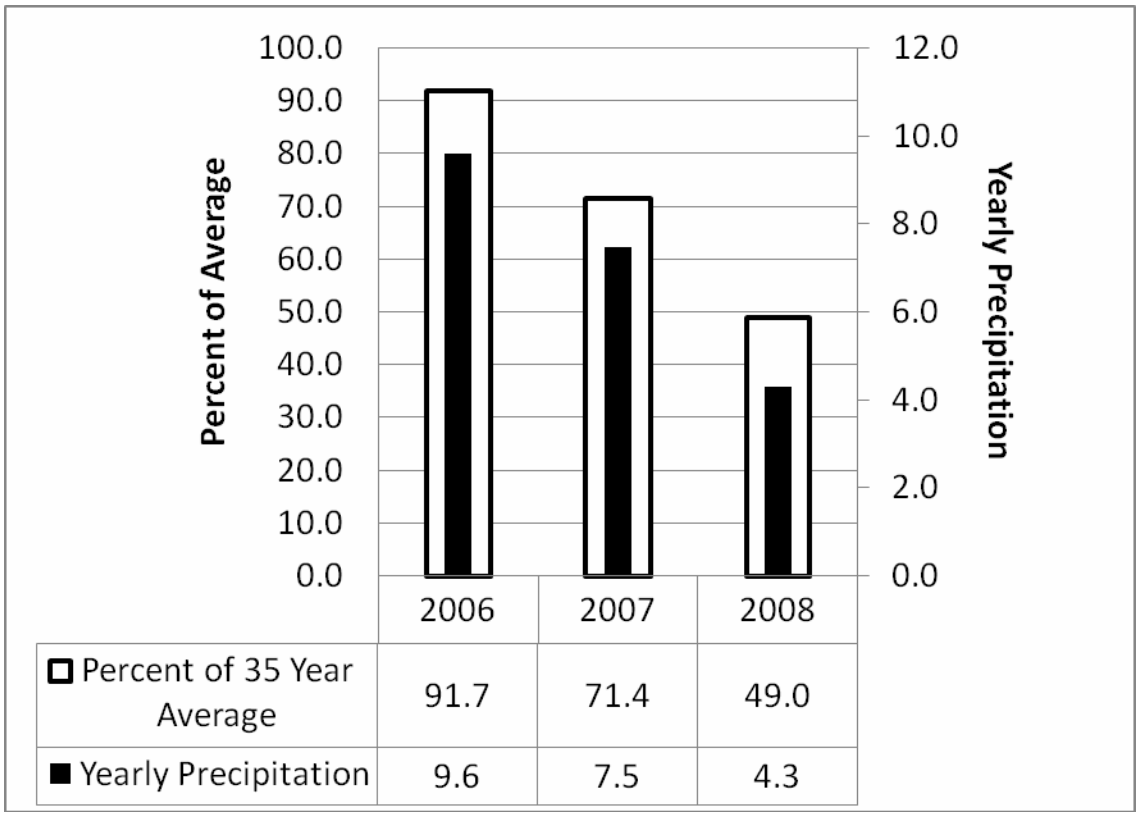


Figure 2. Precipitation totals at the site. Main axis shows percent of 35 year average across years. Secondary axis shows yearly precipitation. 2008 shows year to date through October.

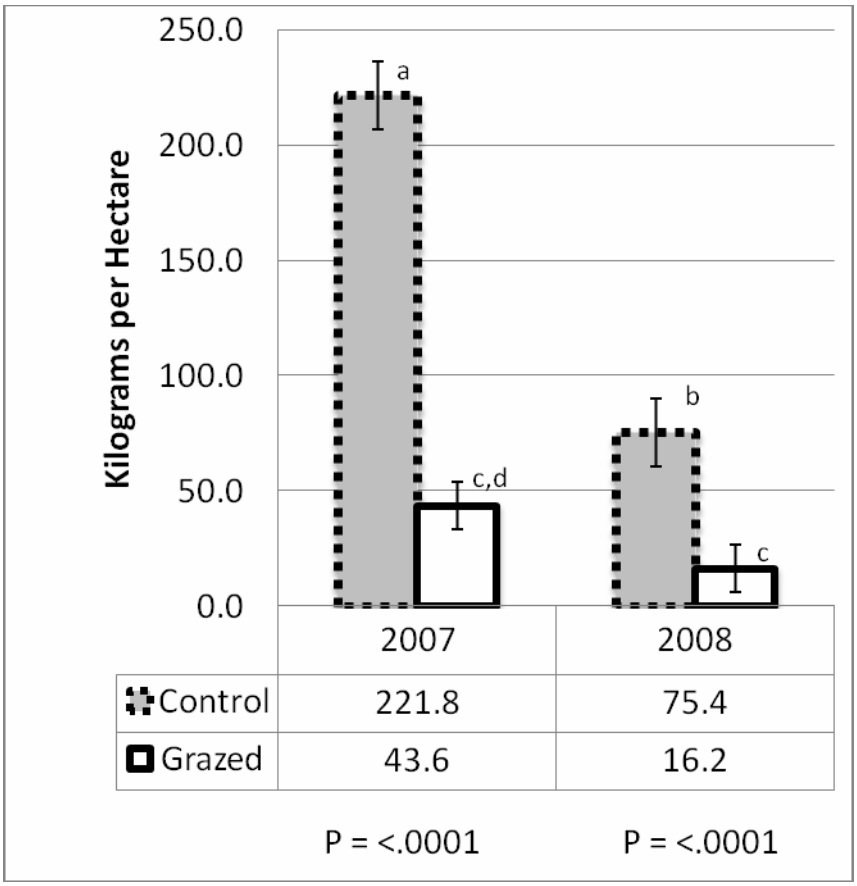


Figure 3. Comparison control and grazed treatment in kg ha^{-1} of post-graze above ground biomass of cheatgrass for 2007 and 2008. Error bars equal standard error. [ab] Means with different superscripts differ ($P < .05$) as determined by Tukey HSD.

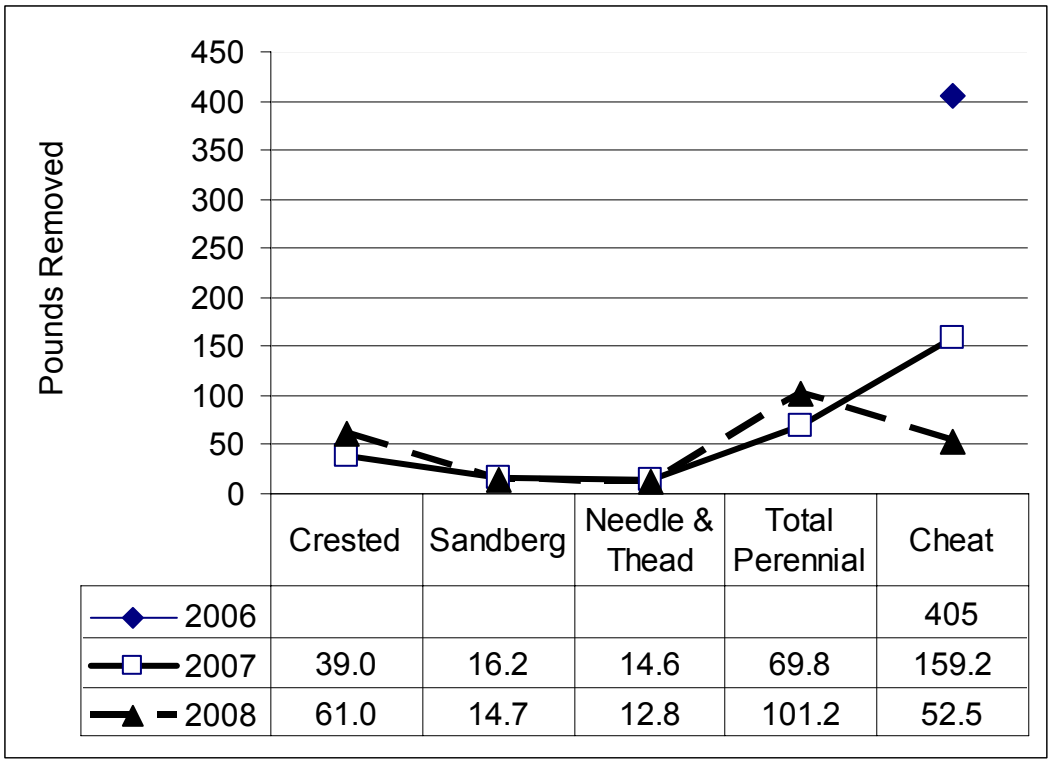
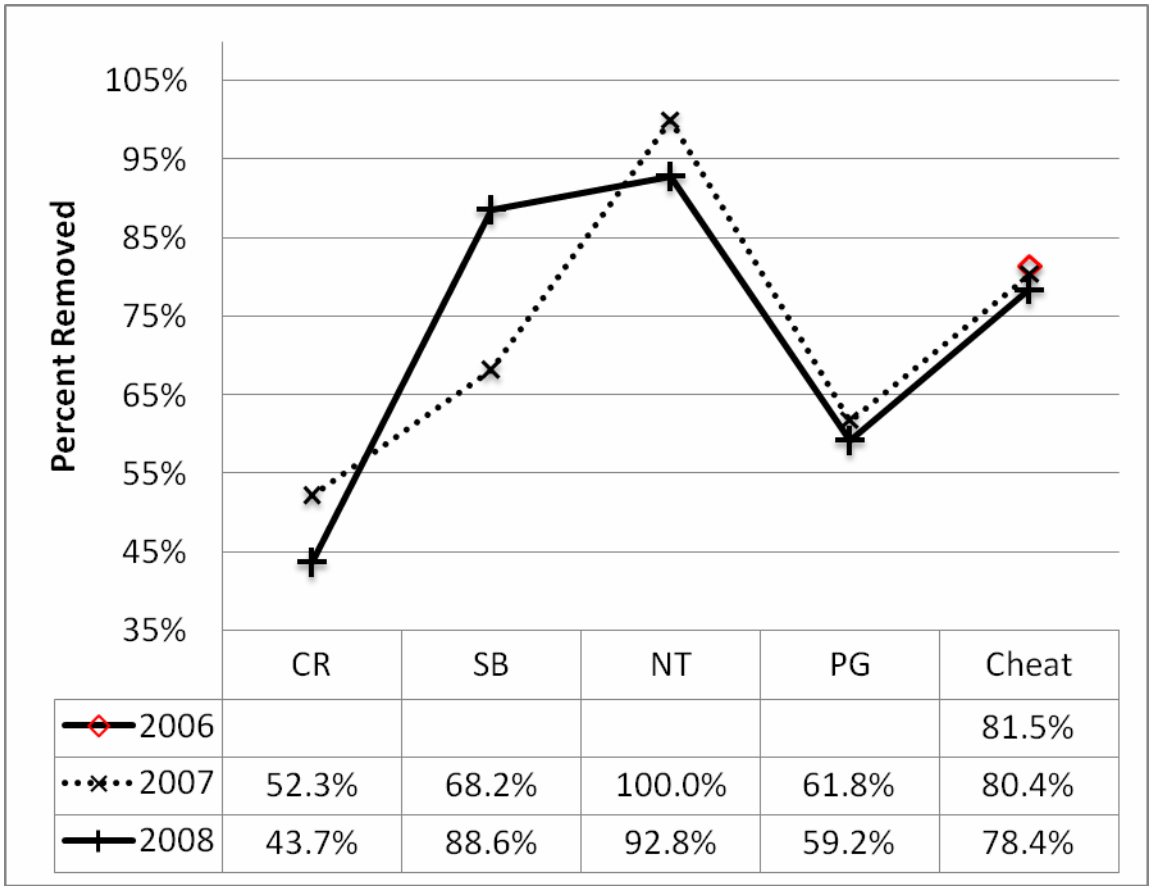


Figure 4. Pounds acre^{-1} removed of five species/functional groups over the three year grazing period. CR = Crested wheatgrass; SB = Sandberg bluegrass; NT = Needleandthread; PG = Total perennial grasses; Cheat = Cheatgrass



	CR	SB	NT	PG	Cheat
2006					81.5%
2007	52.3%	68.2%	100.0%	61.8%	80.4%
2008	43.7%	88.6%	92.8%	59.2%	78.4%

Figure 5. Percentage removed by weight of key grass species over the three year grazing period. CR= crested wheatgrass; SB = Sandberg bluegrass; NT = needleandthread; PG = Total perennial grasses; Cheat = Cheatgrass

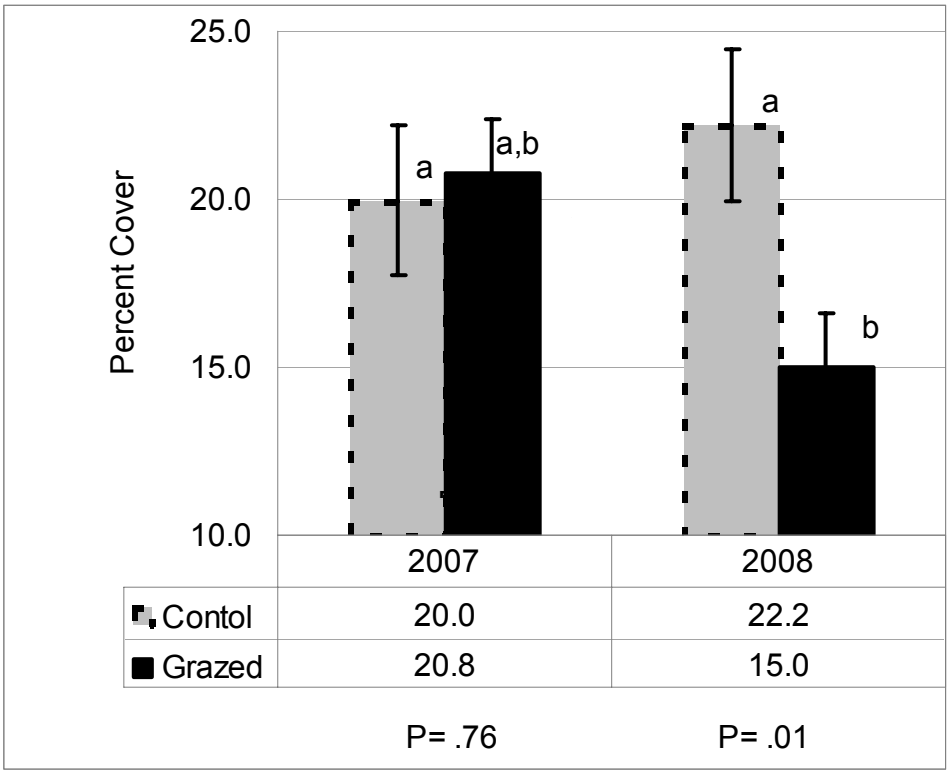


Figure 6. Percent cover of cheatgrass in control and grazed treatment for 2007 and 2008. Error bars equal standard error. [ab] Means with different superscripts differ ($P < .05$) as determined by Student's *t* test.

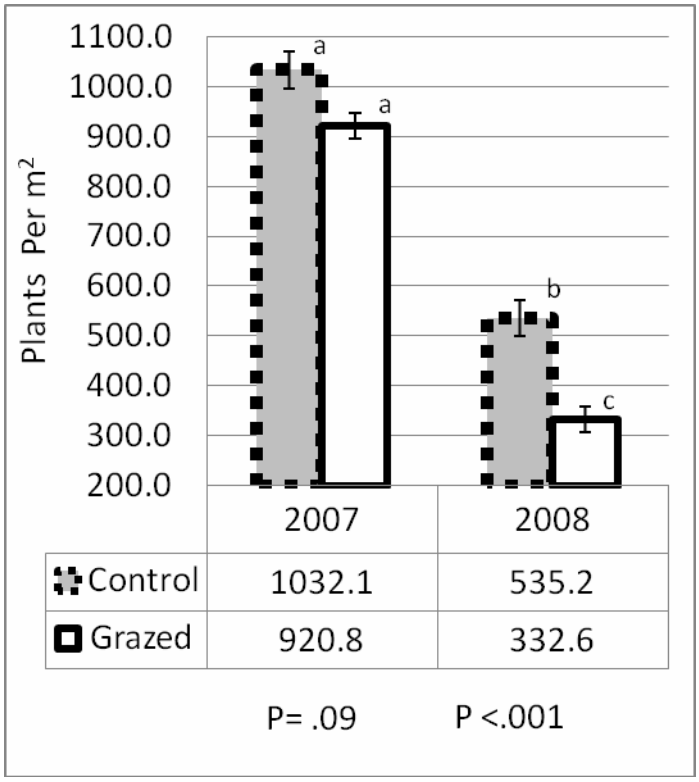


Figure 7. Density of cheatgrass in control and grazed treatment areas for 2007 and 2008. Density values are expressed in plants m^2. Error bars equal standard error. [ab] Means with different superscripts differ ($P < .05$) as determined by Tukey HSD.

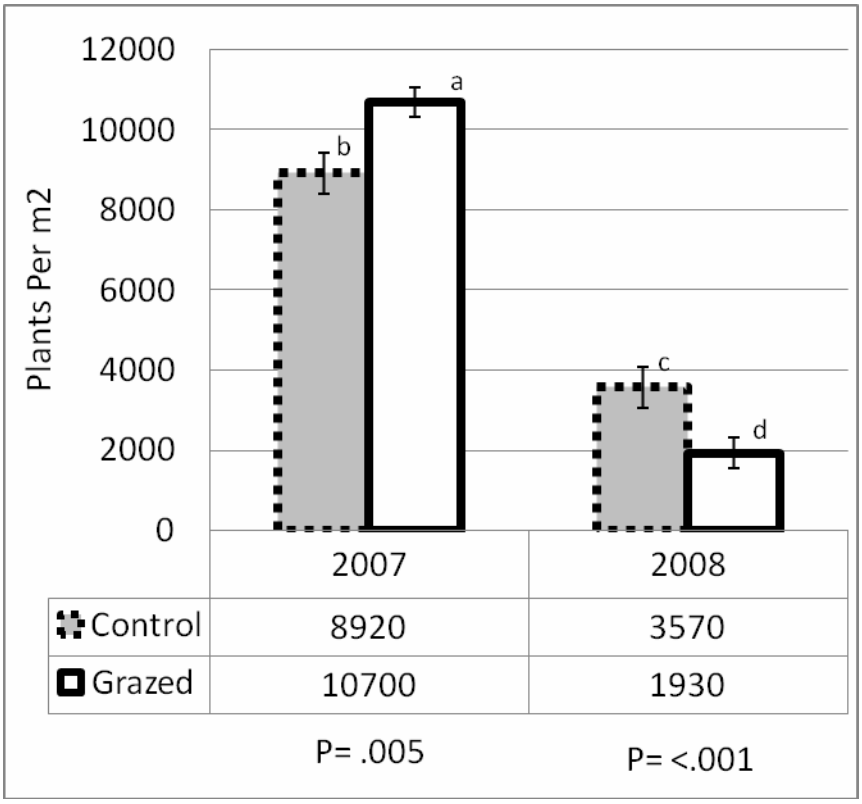


Figure 8. Density of cheatgrass seedbank in control and grazed treatment areas for 2007 and 2008. Seedbank density values are expressed in plants m^2. Error bars equal standard error. [ab] Means within a species with different superscripts differ ($P < .05$) as determined by Student's *t* test.

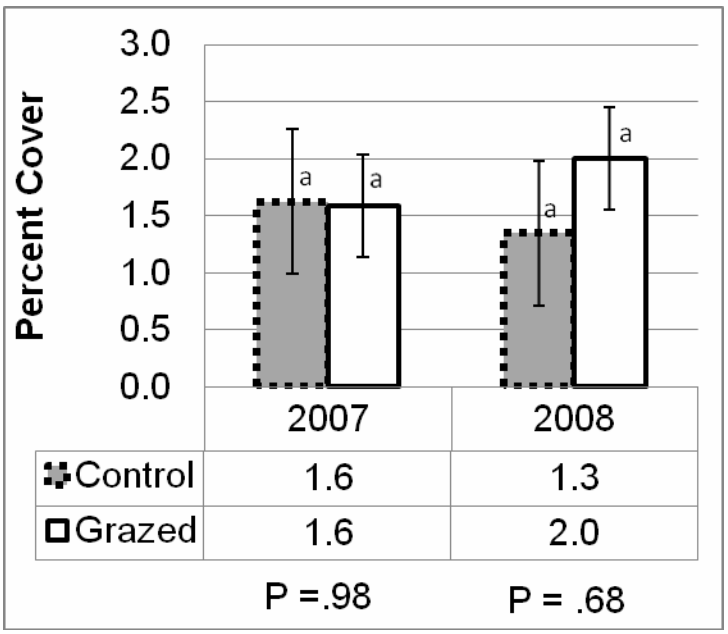


Figure 9. Percent cover of combined total of all perennial grasses in control and grazed treatment areas by year. Error bars equals standard error. [ab] Means with different superscripts differ (P < .05) as determined by Student's *t* test.

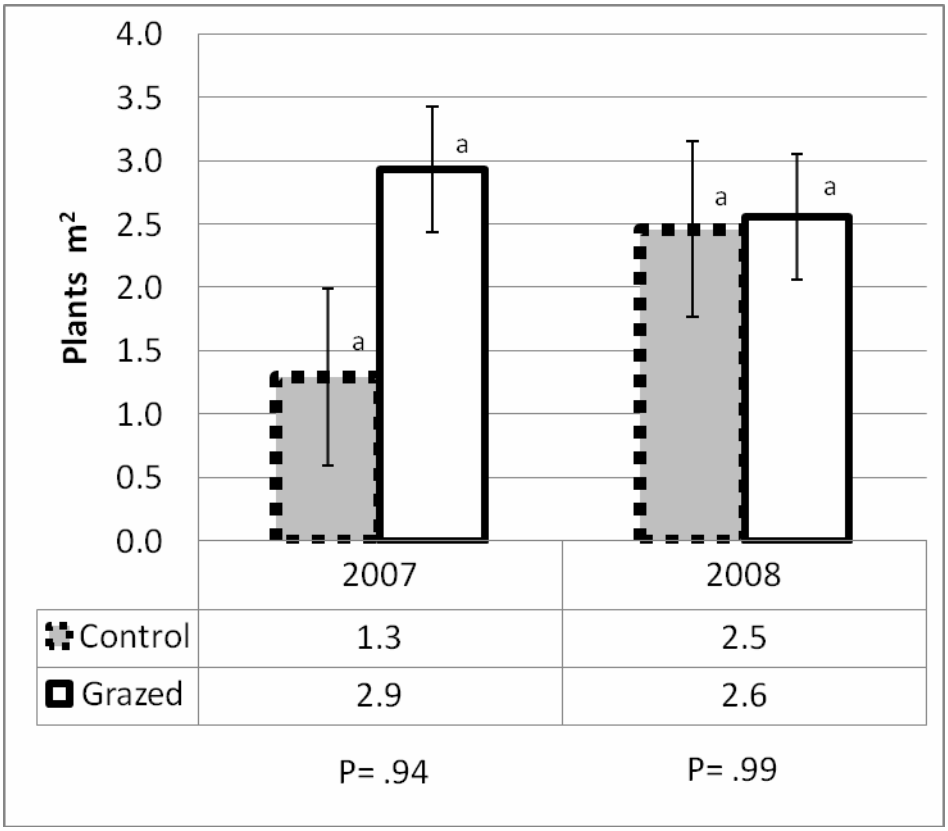


Figure 10.Total perennial grass density in control and grazed treatment areas for 2007 and 2008. Density values are expressed in plants m^2. Error bars equal standard error. ^{ab} Means with different superscripts differ ($P < .05$) as determined by Tukey HSD.

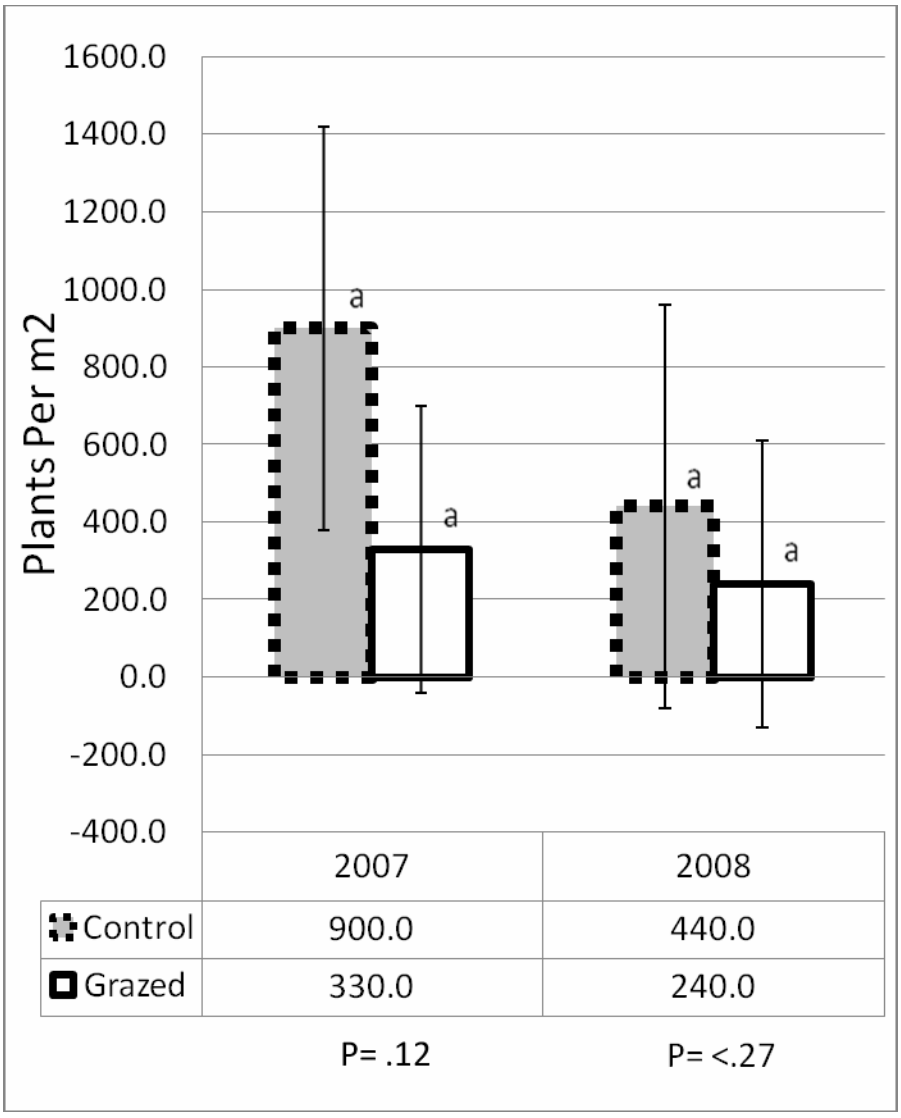


Figure 11. Total combined perennial seedbank density in control and grazed treatment areas by year. Seedbank density values are expressed in plants per plot. Error bars equal standard error. [ab] Means with different superscripts differ ($P < .05$) as determined by Student's *t* test.

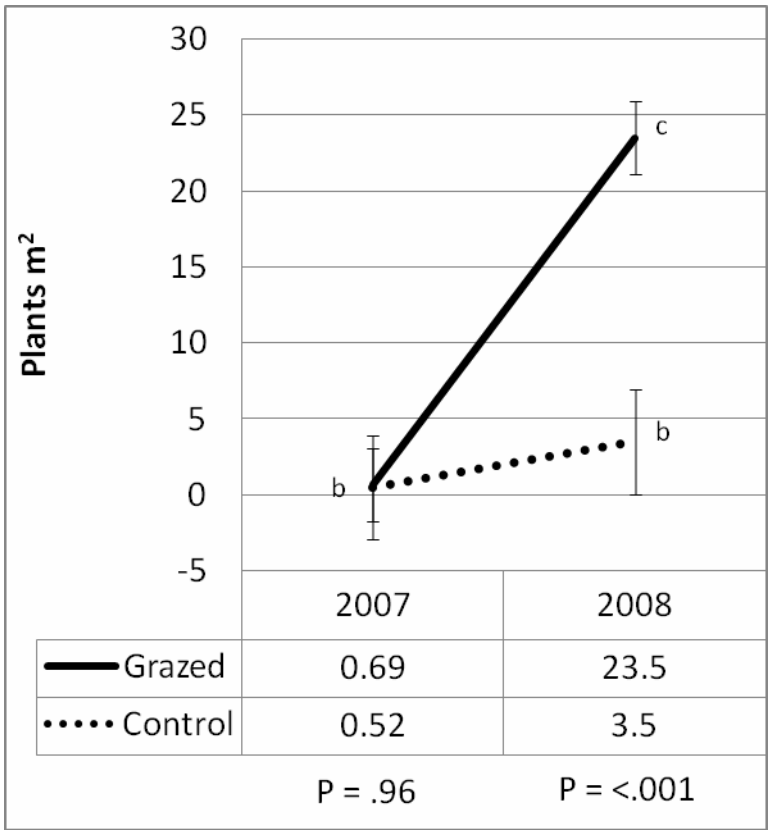


Figure 12. Density of Russian thistle in control and grazed treatment areas for 2007 and 2008. Density values are expressed in plants m^2. Error bars equal standard error. [ab] Means with different superscripts differ (P < .05) as determined by Tukey HSD.

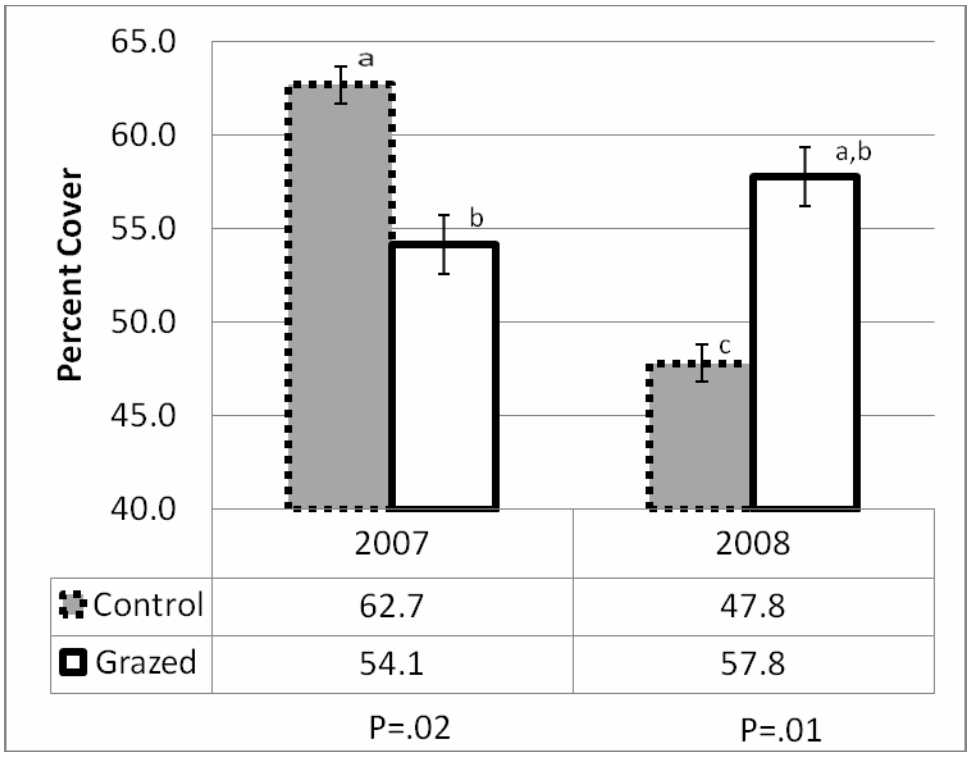


Figure 13. Percent cover of liter in control and grazed treatment areas for 2007 and 2008. Error bars equal standard error. [ab] Means with different superscripts differ ($P < .05$) as determined by Student's *t* test.

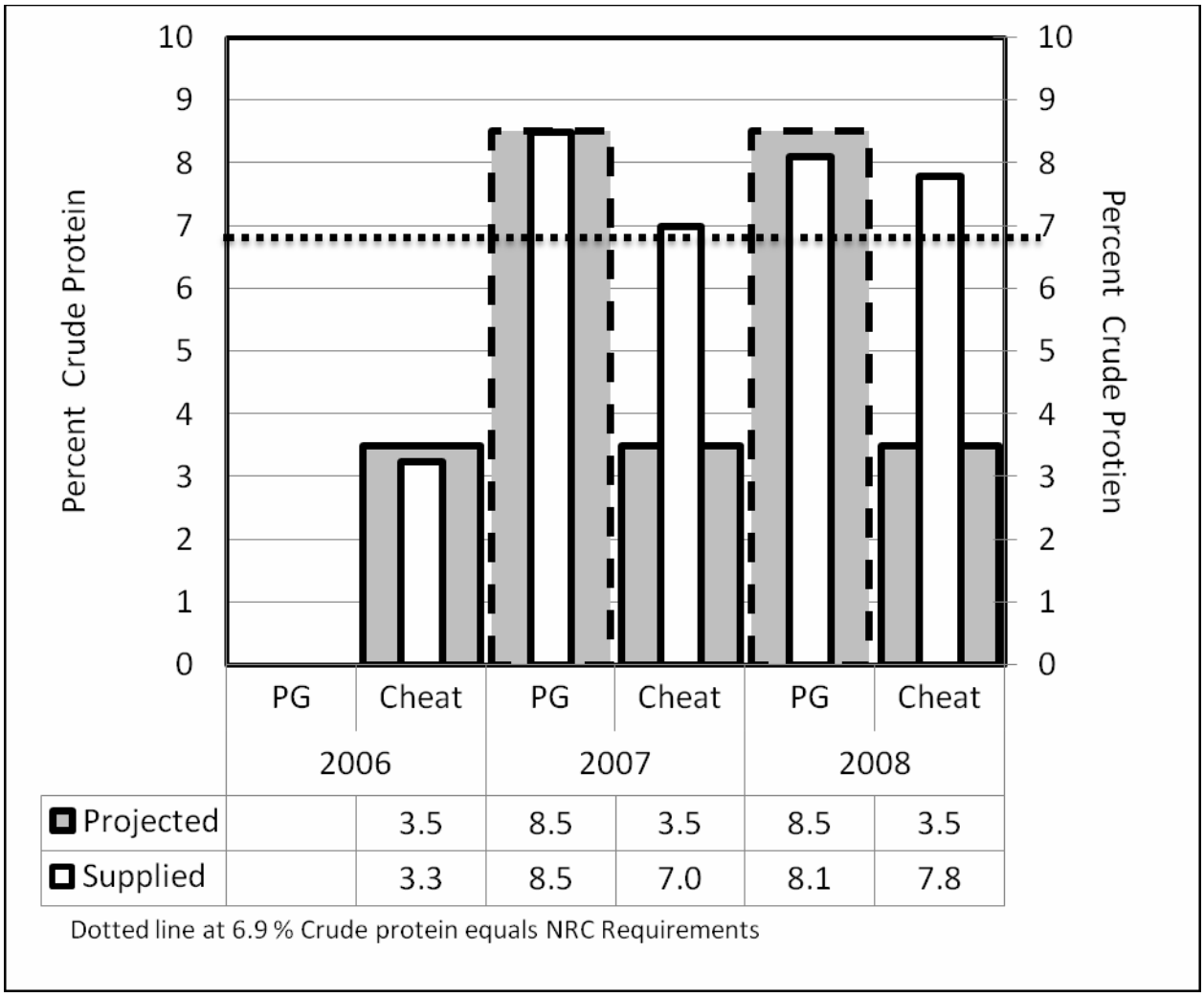


Figure 14. Crude protein (CP) content of cheatgrass (cheat) and an average of all perennial grasses (perennial) analyzed by wet chemistry and reported on a dry matter basis. Samples were taken in September pre-grazing. Dotted line across graph represents CP requirements according to NRC.

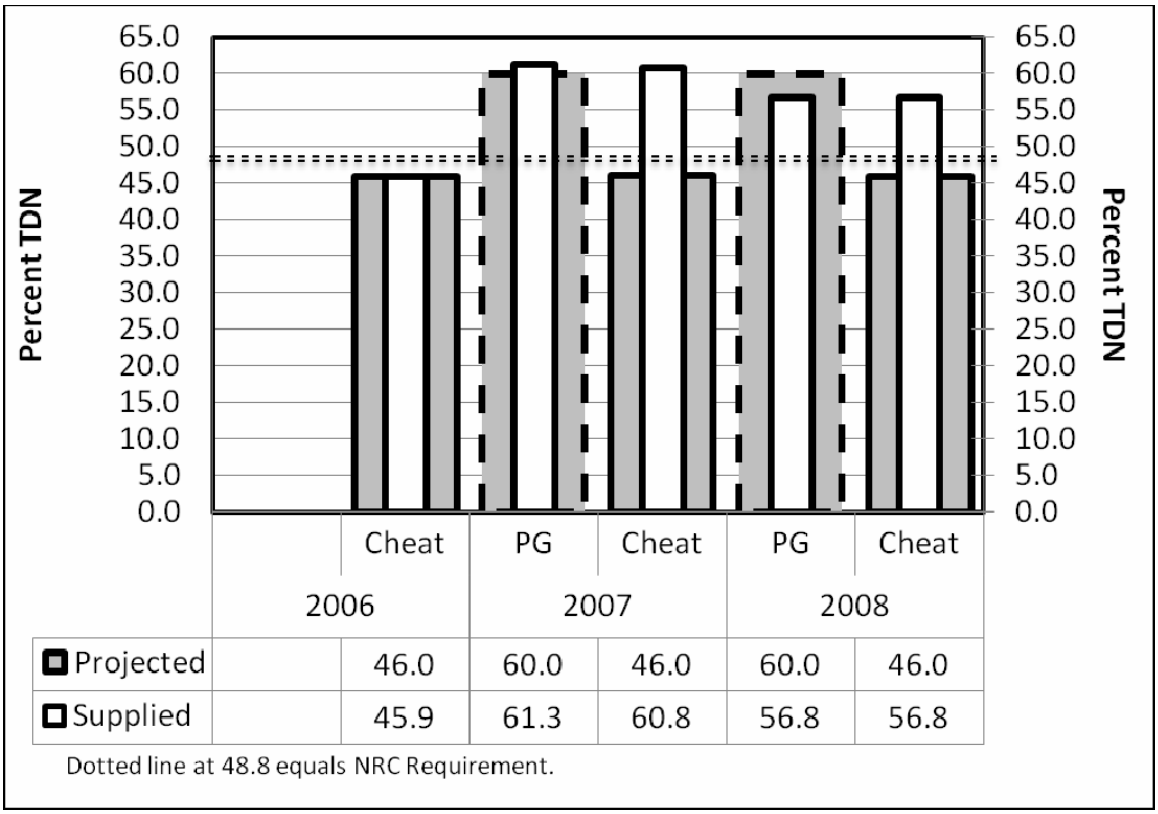


Figure 15. Total digestible nutrients (TDN) of cheatgrass (cheat) and an average of all perennial grasses (perennial) analyzed by wet chemistry and reported on a dry matter basis. Samples were taken in September pre-grazing. Dotted line across graph represents TDN requirements according to NRC.

Appendix A

Data

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2007	1	Grazed	1	1	Cheatgrass	1175	139.8	117.1
2007	1	Grazed	1	2	Cheatgrass	2450	517	82.7
2007	1	Grazed	1	3	Cheatgrass	1575	343.2	123.6
2007	1	Grazed	1	4	Cheatgrass	567	90.5	13
2007	1	Grazed	1	5	Cheatgrass	1200	179.7	21.4
2007	1	Grazed	1	6	Cheatgrass	933	282.8	17.7
2007	1	Grazed	1	7	Cheatgrass	742	131.4	52
2007	1	Grazed	2	1	Cheatgrass	2000	330.2	110.6
2007	1	Grazed	2	2	Cheatgrass	567	67.3	34.4
2007	1	Grazed	2	3	Cheatgrass	1333	265.2	14.9
2007	1	Grazed	2	4	Cheatgrass	1108	351.6	10.2
2007	1	Grazed	2	5	Cheatgrass	1650	195.5	0
2007	1	Grazed	2	6	Cheatgrass	608	319.1	0
2007	1	Grazed	2	7	Cheatgrass	1108	199.2	306.6
2007	1	Grazed	3	1	Cheatgrass	67	238.8	23.2
2007	1	Grazed	3	2	Cheatgrass	275	32	35.5
2007	1	Grazed	3	3	Cheatgrass	433	85	0
2007	1	Grazed	3	4	Cheatgrass	775	96.1	0
2007	1	Grazed	3	5	Cheatgrass	408	46.9	0
2007	1	Grazed	3	6	Cheatgrass	625	110	0
2007	1	Grazed	3	7	Cheatgrass	250	32	0
2007	2	Grazed	4	1	Cheatgrass	350	24.6	0
2007	2	Grazed	4	2	Cheatgrass	117	10.6	0
2007	2	Grazed	4	3	Cheatgrass	67	8.8	0
2007	2	Grazed	4	4	Cheatgrass	117	46.9	42.7
2007	2	Grazed	4	5	Cheatgrass	100	46.9	23.2
2007	2	Grazed	4	6	Cheatgrass	342	84	34.4
2007	2	Grazed	4	7	Cheatgrass	683	212.2	0
2007	2	Grazed	5	1	Cheatgrass	1167	81.2	7.4
2007	2	Grazed	5	2	Cheatgrass	467	137	124.5
2007	2	Grazed	5	3	Cheatgrass	1250	581.1	38.1
2007	2	Grazed	5	4	Cheatgrass	1333	160.2	121.7
2007	2	Grazed	5	5	Cheatgrass	1558	258.7	0
2007	2	Grazed	5	6	Cheatgrass	1150	261.5	35.3
2007	2	Grazed	5	7	Cheatgrass	583	132.3	19.5
2007	2	Grazed	6	1	Cheatgrass	2967	1043.7	28.8
2007	2	Grazed	6	2	Cheatgrass	275	114.7	4.6
2007	2	Grazed	6	3	Cheatgrass	1958	115.6	34.4
2007	2	Grazed	6	4	Cheatgrass	1458	409.2	49.2
2007	2	Grazed	6	5	Cheatgrass	1083	98	68.7
2007	2	Grazed	6	6	Cheatgrass	900	215	34.4
2007	2	Grazed	6	7	Cheatgrass	900	187.1	6.5
2007	3	Control	7	1	Cheatgrass	10	62.7	62.7
2007	3	Control	7	2	Cheatgrass	1383	212.2	212.2
2007	3	Control	7	3	Cheatgrass	483	340.4	340.4
2007	3	Control	7	4	Cheatgrass	1225	246.6	246.6
2007	3	Control	7	5	Cheatgrass	1767	320.9	320.9
2007	3	Control	7	6	Cheatgrass	467	75.7	75.7

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2007	3	Control	7	7	Cheatgrass	275	27.4	27.4
2007	3	Control	8	1	Cheatgrass	1908	616.4	616.4
2007	3	Control	8	2	Cheatgrass	817	91.5	91.5
2007	3	Control	8	3	Cheatgrass	733	425.9	425.9
2007	3	Control	8	4	Cheatgrass	858	200.2	200.2
2007	3	Control	8	5	Cheatgrass	817	192.7	192.7
2007	3	Control	8	6	Cheatgrass	1183	260.5	260.5
2007	3	Control	8	7	Cheatgrass	733	231.7	231.7
2007	3	Control	9	1	Cheatgrass	1633	388.7	388.7
2007	3	Control	9	2	Cheatgrass	600	165.8	165.8
2007	3	Control	9	3	Cheatgrass	1833	469.6	469.6
2007	3	Control	9	4	Cheatgrass	600	175.1	175.1
2007	3	Control	9	5	Cheatgrass	1700	314.4	314.4
2007	3	Control	9	6	Cheatgrass	1400	457.5	457.5
2007	3	Control	9	7	Cheatgrass	1250	230.8	230.8
2007	1	Grazed	1	1	Crested	1	172.4	0
2007	1	Grazed	1	2	Crested	0	109.2	32.5
2007	1	Grazed	1	3	Crested	0	0	0
2007	1	Grazed	1	4	Crested	1	191.9	0
2007	1	Grazed	1	5	Crested	0	0	0
2007	1	Grazed	1	6	Crested	0	191.9	8.1
2007	1	Grazed	1	7	Crested	2	0	0
2007	1	Grazed	2	1	Crested	0	0	0
2007	1	Grazed	2	2	Crested	0	0	0
2007	1	Grazed	2	3	Crested	0	0	38.1
2007	1	Grazed	2	4	Crested	0	0	0
2007	1	Grazed	2	5	Crested	4	0	0
2007	1	Grazed	2	6	Crested	1	0	9.5
2007	1	Grazed	2	7	Crested	0	173.3	0
2007	1	Grazed	3	1	Crested	0	0	273.1
2007	1	Grazed	3	2	Crested	1	82.2	128.2
2007	1	Grazed	3	3	Crested	6	236.5	0
2007	1	Grazed	3	4	Crested	1	31.1	24.2
2007	1	Grazed	3	5	Crested	2	236.5	0
2007	1	Grazed	3	6	Crested	1	31.1	106.4
2007	1	Grazed	3	7	Crested	4	302.4	0
2007	2	Grazed	4	1	Crested	0	0	0
2007	2	Grazed	4	2	Crested	0	0	0
2007	2	Grazed	4	3	Crested	0	0	0
2007	2	Grazed	4	4	Crested	0	0	0
2007	2	Grazed	4	5	Crested	0	0	0
2007	2	Grazed	4	6	Crested	1	0	0
2007	2	Grazed	4	7	Crested	0	0	0
2007	2	Grazed	5	1	Crested	0	0	0
2007	2	Grazed	5	2	Crested	0	0	0
2007	2	Grazed	5	3	Crested	1	209.5	0
2007	2	Grazed	5	4	Crested	1	10.7	16.7
2007	2	Grazed	5	5	Crested	0	209.5	0

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2007	2	Grazed	5	6	Crested	0	10.7	4.2
2007	2	Grazed	5	7	Crested	0	0	0
2007	2	Grazed	6	1	Crested	0	0	0
2007	2	Grazed	6	2	Crested	0	0	1.9
2007	2	Grazed	6	3	Crested	0	4.2	0
2007	2	Grazed	6	4	Crested	2	30.2	3.7
2007	2	Grazed	6	5	Crested	1	4.2	0
2007	2	Grazed	6	6	Crested	0	30.2	1.4
2007	2	Grazed	6	7	Crested	1	59.9	0
2007	3	Control	7	1	Crested	1	58.1	58.1
2007	3	Control	7	2	Crested	0	0	0
2007	3	Control	7	3	Crested	0	0	0
2007	3	Control	7	4	Crested	0	93.4	93.4
2007	3	Control	7	5	Crested	0	0	0
2007	3	Control	7	6	Crested	0	93.4	93.4
2007	3	Control	7	7	Crested	6	0	0
2007	3	Control	8	1	Crested	0	0	0
2007	3	Control	8	2	Crested	1	155.6	155.6
2007	3	Control	8	3	Crested	0	0	0
2007	3	Control	8	4	Crested	0	0	0
2007	3	Control	8	5	Crested	2	0	0
2007	3	Control	8	6	Crested	0	0	0
2007	3	Control	8	7	Crested	1	69.2	69.2
2007	3	Control	9	1	Crested	0	0	0
2007	3	Control	9	2	Crested	0	0	0
2007	3	Control	9	3	Crested	0	0	0
2007	3	Control	9	4	Crested	4	0	0
2007	3	Control	9	5	Crested	0	0	0
2007	3	Control	9	6	Crested	0	0	0
2007	3	Control	9	7	Crested	0	0	0
2007	1	Grazed	1	1	Sandberg	11	8.8	0
2007	1	Grazed	1	2	Sandberg	0	0	24.2
2007	1	Grazed	1	3	Sandberg	0	0	0
2007	1	Grazed	1	4	Sandberg	10	25.6	27.9
2007	1	Grazed	1	5	Sandberg	0	0	0
2007	1	Grazed	1	6	Sandberg	0	25.6	13
2007	1	Grazed	1	7	Sandberg	0	24.6	0
2007	1	Grazed	2	1	Sandberg	2	2.3	0
2007	1	Grazed	2	2	Sandberg	0	0	0
2007	1	Grazed	2	3	Sandberg	9	14.4	10.2
2007	1	Grazed	2	4	Sandberg	1	11.6	0
2007	1	Grazed	2	5	Sandberg	1	14.4	0
2007	1	Grazed	2	6	Sandberg	17	11.6	2.6
2007	1	Grazed	2	7	Sandberg	10	2.3	0
2007	1	Grazed	3	1	Sandberg	14	30.2	0
2007	1	Grazed	3	2	Sandberg	36	38.6	8.4
2007	1	Grazed	3	3	Sandberg	0	0	0
2007	1	Grazed	3	4	Sandberg	2	11.6	0

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2007	1	Grazed	3	5	Sandberg	4	0	0
2007	1	Grazed	3	6	Sandberg	5	11.6	2.1
2007	1	Grazed	3	7	Sandberg	14	6.1	0
2007	2	Grazed	4	1	Sandberg	0	0	0
2007	2	Grazed	4	2	Sandberg	49	89.7	0
2007	2	Grazed	4	3	Sandberg	48	46	6.5
2007	2	Grazed	4	4	Sandberg	14	26.5	14.9
2007	2	Grazed	4	5	Sandberg	15	46	0
2007	2	Grazed	4	6	Sandberg	40	26.5	5.3
2007	2	Grazed	4	7	Sandberg	16	33.9	0
2007	2	Grazed	5	1	Sandberg	6	3.3	0
2007	2	Grazed	5	2	Sandberg	2	9.8	0
2007	2	Grazed	5	3	Sandberg	7	23.7	10.2
2007	2	Grazed	5	4	Sandberg	5	1.4	0
2007	2	Grazed	5	5	Sandberg	0	23.7	0
2007	2	Grazed	5	6	Sandberg	0	1.4	2.6
2007	2	Grazed	5	7	Sandberg	9	0	0
2007	2	Grazed	6	1	Sandberg	0	0	0
2007	2	Grazed	6	2	Sandberg	0	0	0
2007	2	Grazed	6	3	Sandberg	0	0	0
2007	2	Grazed	6	4	Sandberg	3	0	0
2007	2	Grazed	6	5	Sandberg	18	0	0
2007	2	Grazed	6	6	Sandberg	17	0	0
2007	2	Grazed	6	7	Sandberg	10	43.2	0
2007	3	Control	7	1	Sandberg	17	57.2	57.2
2007	3	Control	7	2	Sandberg	1	0	0
2007	3	Control	7	3	Sandberg	0	0	0
2007	3	Control	7	4	Sandberg	0	14.4	14.4
2007	3	Control	7	5	Sandberg	0	0	0
2007	3	Control	7	6	Sandberg	4	14.4	14.4
2007	3	Control	7	7	Sandberg	18	0	0
2007	3	Control	8	1	Sandberg	0	0	0
2007	3	Control	8	2	Sandberg	5	0	0
2007	3	Control	8	3	Sandberg	1	0	0
2007	3	Control	8	4	Sandberg	10	33.9	33.9
2007	3	Control	8	5	Sandberg	2	0	0
2007	3	Control	8	6	Sandberg	2	33.9	33.9
2007	3	Control	8	7	Sandberg	6	0	0
2007	3	Control	9	1	Sandberg	0	4.2	4.2
2007	3	Control	9	2	Sandberg	13	17.2	17.2
2007	3	Control	9	3	Sandberg	0	0	0
2007	3	Control	9	4	Sandberg	10	0	0
2007	3	Control	9	5	Sandberg	0	0	0
2007	3	Control	9	6	Sandberg	0	0	0
2007	3	Control	9	7	Sandberg	5	0	0
2007	1	Grazed	1	1	Stipa	0	0	0
2007	1	Grazed	1	2	Stipa	0	0	0
2007	1	Grazed	1	3	Stipa	0	0	0

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2007	1	Grazed	1	4	Stipa	0	0	0
2007	1	Grazed	1	5	Stipa	0	0	0
2007	1	Grazed	1	6	Stipa	0	0	0
2007	1	Grazed	1	7	Stipa	0	0	0
2007	1	Grazed	2	1	Stipa	0	0	0
2007	1	Grazed	2	2	Stipa	3	39.5	0
2007	1	Grazed	2	3	Stipa	0	0	0
2007	1	Grazed	2	4	Stipa	0	0	0
2007	1	Grazed	2	5	Stipa	0	0	0
2007	1	Grazed	2	6	Stipa	0	0	0
2007	1	Grazed	2	7	Stipa	0	0	0
2007	1	Grazed	3	1	Stipa	0	0.0	0
2007	1	Grazed	3	2	Stipa	0	0.0	0
2007	1	Grazed	3	3	Stipa	0	0.0	0
2007	1	Grazed	3	4	Stipa	0	263.4	0
2007	1	Grazed	3	5	Stipa	0	0.0	0
2007	1	Grazed	3	6	Stipa	4	161.2	0
2007	1	Grazed	3	7	Stipa	3	59.0	0
2007	2	Grazed	4	1	Stipa	0	0	0
2007	2	Grazed	4	2	Stipa	0	0	0
2007	2	Grazed	4	3	Stipa	0	0	0
2007	2	Grazed	4	4	Stipa	19	0	0
2007	2	Grazed	4	5	Stipa	0	0	0
2007	2	Grazed	4	6	Stipa	0	0	0
2007	2	Grazed	4	7	Stipa	0	0	0
2007	2	Grazed	5	1	Stipa	0	0	0
2007	2	Grazed	5	2	Stipa	9	0	0
2007	2	Grazed	5	3	Stipa	0	0	0
2007	2	Grazed	5	4	Stipa	0	0	0
2007	2	Grazed	5	5	Stipa	0	0	0
2007	2	Grazed	5	6	Stipa	8	0	0
2007	2	Grazed	5	7	Stipa	0	0	0
2007	2	Grazed	6	1	Stipa	0	0	0
2007	2	Grazed	6	2	Stipa	0	0	0
2007	2	Grazed	6	3	Stipa	0	0	0
2007	2	Grazed	6	4	Stipa	0	0	0
2007	2	Grazed	6	5	Stipa	0	0	0
2007	2	Grazed	6	6	Stipa	0	0	0
2007	2	Grazed	6	7	Stipa	0	0	0
2007	3	Control	7	1	Stipa	0	0	0
2007	3	Control	7	2	Stipa	0	0	0
2007	3	Control	7	3	Stipa	0	0	0
2007	3	Control	7	4	Stipa	0	0	0
2007	3	Control	7	5	Stipa	0	0	0
2007	3	Control	7	6	Stipa	0	0	0
2007	3	Control	7	7	Stipa	0	0	0
2007	3	Control	8	1	Stipa	0	0	0
2007	3	Control	8	2	Stipa	0	0	0

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2007	3	Control	8	3	Stipa	0	0	0
2007	3	Control	8	4	Stipa	0	0	0
2007	3	Control	8	5	Stipa	0	0	0
2007	3	Control	8	6	Stipa	0	0	0
2007	3	Control	8	7	Stipa	0	0	0
2007	3	Control	9	1	Stipa	0	0	0
2007	3	Control	9	2	Stipa	0	0	0
2007	3	Control	9	3	Stipa	0	0	0
2007	3	Control	9	4	Stipa	0	0	0
2007	3	Control	9	5	Stipa	0	0	0
2007	3	Control	9	6	Stipa	0	0	0
2007	3	Control	9	7	Stipa	0	0	0
2007	1	Grazed	1	1	Rice Grass	0	0	0
2007	1	Grazed	1	2	Rice Grass	0	0	0
2007	1	Grazed	1	3	Rice Grass	0	0	0
2007	1	Grazed	1	4	Rice Grass	0	0	0
2007	1	Grazed	1	5	Rice Grass	0	0	0
2007	1	Grazed	1	6	Rice Grass	0	0	0
2007	1	Grazed	1	7	Rice Grass	0	0	0
2007	1	Grazed	2	1	Rice Grass	0	0	0
2007	1	Grazed	2	2	Rice Grass	0	0	0
2007	1	Grazed	2	3	Rice Grass	0	0	0
2007	1	Grazed	2	4	Rice Grass	0	0	0
2007	1	Grazed	2	5	Rice Grass	0	0	0
2007	1	Grazed	2	6	Rice Grass	0	0	0
2007	1	Grazed	2	7	Rice Grass	0	0	0
2007	1	Grazed	3	1	Rice Grass	0	0	0
2007	1	Grazed	3	2	Rice Grass	0	0	0
2007	1	Grazed	3	3	Rice Grass	0	0	0
2007	1	Grazed	3	4	Rice Grass	0	0	0
2007	1	Grazed	3	5	Rice Grass	0	0	0
2007	1	Grazed	3	6	Rice Grass	0	0	0
2007	1	Grazed	3	7	Rice Grass	0	0	0
2007	2	Grazed	4	1	Rice Grass	0	0	0
2007	2	Grazed	4	2	Rice Grass	0	0	0
2007	2	Grazed	4	3	Rice Grass	0	0	0
2007	2	Grazed	4	4	Rice Grass	3	0	0
2007	2	Grazed	4	5	Rice Grass	0	0	0
2007	2	Grazed	4	6	Rice Grass	0	0	0
2007	2	Grazed	4	7	Rice Grass	0	0	0
2007	2	Grazed	5	1	Rice Grass	0	0	0
2007	2	Grazed	5	2	Rice Grass	5	10.5	0
2007	2	Grazed	5	3	Rice Grass	0	0	0
2007	2	Grazed	5	4	Rice Grass	0	0	0
2007	2	Grazed	5	5	Rice Grass	4	9.5	0
2007	2	Grazed	5	6	Rice Grass	4	8	0
2007	2	Grazed	5	7	Rice Grass	0	0	0
2007	2	Grazed	6	1	Rice Grass	5	11.5	0

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2007	2	Grazed	6	2	Rice Grass	0	0	0
2007	2	Grazed	6	3	Rice Grass	0	0	0
2007	2	Grazed	6	4	Rice Grass	0	0	0
2007	2	Grazed	6	5	Rice Grass	0	0	0
2007	2	Grazed	6	6	Rice Grass	0	0	0
2007	2	Grazed	6	7	Rice Grass	0	0	0
2007	3	Control	7	1	Rice Grass	0	0	0
2007	3	Control	7	2	Rice Grass	0	0	0
2007	3	Control	7	3	Rice Grass	0	0	0
2007	3	Control	7	4	Rice Grass	0	0	0
2007	3	Control	7	5	Rice Grass	0	0	0
2007	3	Control	7	6	Rice Grass	0	0	0
2007	3	Control	7	7	Rice Grass	0	0	0
2007	3	Control	8	1	Rice Grass	0	0	0
2007	3	Control	8	2	Rice Grass	0	0	0
2007	3	Control	8	3	Rice Grass	0	0	0
2007	3	Control	8	4	Rice Grass	0	0	0
2007	3	Control	8	5	Rice Grass	0	0	0
2007	3	Control	8	6	Rice Grass	0	0	0
2007	3	Control	8	7	Rice Grass	0	0	0
2007	3	Control	9	1	Rice Grass	0	0	0
2007	3	Control	9	2	Rice Grass	0	0	0
2007	3	Control	9	3	Rice Grass	0	0	0
2007	3	Control	9	4	Rice Grass	0	0	0
2007	3	Control	9	5	Rice Grass	0	0	0
2007	3	Control	9	6	Rice Grass	0	0	0
2007	3	Control	9	7	Rice Grass	0	0	0
2007	1	Grazed	1	1	Annual Mustard	0		
2007	1	Grazed	1	2	Annual Mustard	0		
2007	1	Grazed	1	3	Annual Mustard	15		
2007	1	Grazed	1	4	Annual Mustard	75		
2007	1	Grazed	1	5	Annual Mustard	75		
2007	1	Grazed	1	6	Annual Mustard	0		
2007	1	Grazed	1	7	Annual Mustard	0		
2007	1	Grazed	2	1	Annual Mustard	10		
2007	1	Grazed	2	2	Annual Mustard	600		
2007	1	Grazed	2	3	Annual Mustard	0		
2007	1	Grazed	2	4	Annual Mustard	0		
2007	1	Grazed	2	5	Annual	0		

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2007	1	Grazed	2	6	Mustard Annual Mustard	7		
2007	1	Grazed	2	7	Mustard Annual Mustard	0		
2007	1	Grazed	3	1	Mustard Annual Mustard	40		
2007	1	Grazed	3	2	Mustard Annual Mustard	0		
2007	1	Grazed	3	3	Mustard Annual Mustard	2		
2007	1	Grazed	3	4	Mustard Annual Mustard	40		
2007	1	Grazed	3	5	Mustard Annual Mustard	88		
2007	1	Grazed	3	6	Mustard Annual Mustard	0		
2007	1	Grazed	3	7	Mustard Annual Mustard	57		
2007	2	Grazed	4	1	Mustard Annual Mustard	688		
2007	2	Grazed	4	2	Mustard Annual Mustard	544		
2007	2	Grazed	4	3	Mustard Annual Mustard	488		
2007	2	Grazed	4	4	Mustard Annual Mustard	576		
2007	2	Grazed	4	5	Mustard Annual Mustard	320		
2007	2	Grazed	4	6	Mustard Annual Mustard	4		
2007	2	Grazed	4	7	Mustard Annual Mustard	18		
2007	2	Grazed	5	1	Mustard Annual Mustard	8		
2007	2	Grazed	5	2	Mustard Annual Mustard	0		
2007	2	Grazed	5	3	Mustard Annual Mustard	14		
2007	2	Grazed	5	4	Mustard Annual Mustard	1		
2007	2	Grazed	5	5	Mustard Annual Mustard	408		
2007	2	Grazed	5	6	Mustard Annual Mustard	0		
2007	2	Grazed	5	7	Mustard Annual Mustard	8		
2007	2	Grazed	6	1	Mustard Annual Mustard	18		
2007	2	Grazed	6	2	Mustard Annual Mustard	264		
2007	2	Grazed	6	3	Mustard	48		

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2007	2	Grazed	6	4	Annual Mustard	0		
2007	2	Grazed	6	5	Annual Mustard	0		
2007	2	Grazed	6	6	Annual Mustard	64		
2007	2	Grazed	6	7	Annual Mustard	42		
2007	3	Control	7	1	Annual Mustard	10		
2007	3	Control	7	2	Annual Mustard	16		
2007	3	Control	7	3	Annual Mustard	32		
2007	3	Control	7	4	Annual Mustard	24		
2007	3	Control	7	5	Annual Mustard	16		
2007	3	Control	7	6	Annual Mustard	5		
2007	3	Control	7	7	Annual Mustard	0		
2007	3	Control	8	1	Annual Mustard	18		
2007	3	Control	8	2	Annual Mustard	8		
2007	3	Control	8	3	Annual Mustard	4		
2007	3	Control	8	4	Annual Mustard	7		
2007	3	Control	8	5	Annual Mustard	5		
2007	3	Control	8	6	Annual Mustard	4		
2007	3	Control	8	7	Annual Mustard	1		
2007	3	Control	9	1	Annual Mustard	0		
2007	3	Control	9	2	Annual Mustard	5		
2007	3	Control	9	3	Annual Mustard	40		
2007	3	Control	9	4	Annual Mustard	0		
2007	3	Control	9	5	Annual Mustard	2		
2007	3	Control	9	6	Annual Mustard	40		
2007	3	Control	9	7	Annual Mustard	48		
2007	1	Grazed	1	1	RT	0		
2007	1	Grazed	1	2	RT	0		
2007	1	Grazed	1	3	RT	0		

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2007	1	Grazed	1	4	RT	2		
2007	1	Grazed	1	5	RT	0		
2007	1	Grazed	1	6	RT	0		
2007	1	Grazed	1	7	RT	4		
2007	1	Grazed	2	1	RT	0		
2007	1	Grazed	2	2	RT	0		
2007	1	Grazed	2	3	RT	0		
2007	1	Grazed	2	4	RT	2		
2007	1	Grazed	2	5	RT	0		
2007	1	Grazed	2	6	RT	4		
2007	1	Grazed	2	7	RT	2		
2007	1	Grazed	3	1	RT	0		
2007	1	Grazed	3	2	RT	1		
2007	1	Grazed	3	3	RT	0		
2007	1	Grazed	3	4	RT	0		
2007	1	Grazed	3	5	RT	6		
2007	1	Grazed	3	6	RT	5		
2007	1	Grazed	3	7	RT	1		
2007	2	Grazed	4	1	RT	0		
2007	2	Grazed	4	2	RT	0		
2007	2	Grazed	4	3	RT	0		
2007	2	Grazed	4	4	RT	0		
2007	2	Grazed	4	5	RT	0		
2007	2	Grazed	4	6	RT	0		
2007	2	Grazed	4	7	RT	0		
2007	2	Grazed	5	1	RT	0		
2007	2	Grazed	5	2	RT	0		
2007	2	Grazed	5	3	RT	0		
2007	2	Grazed	5	4	RT	0		
2007	2	Grazed	5	5	RT	0		
2007	2	Grazed	5	6	RT	0		
2007	2	Grazed	5	7	RT	0		
2007	2	Grazed	6	1	RT	0		
2007	2	Grazed	6	2	RT	0		
2007	2	Grazed	6	3	RT	0		
2007	2	Grazed	6	4	RT	0		
2007	2	Grazed	6	5	RT	2		
2007	2	Grazed	6	6	RT	0		
2007	2	Grazed	6	7	RT	0		
2007	3	Control	7	1	RT	0		
2007	3	Control	7	2	RT	0		
2007	3	Control	7	3	RT	8		
2007	3	Control	7	4	RT	0		
2007	3	Control	7	5	RT	0		
2007	3	Control	7	6	RT	0		
2007	3	Control	7	7	RT	0		
2007	3	Control	8	1	RT	0		
2007	3	Control	8	2	RT	1		

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2007	3	Control	8	3	RT	0		
2007	3	Control	8	4	RT	2		
2007	3	Control	8	5	RT	0		
2007	3	Control	8	6	RT	0		
2007	3	Control	8	7	RT	0		
2007	3	Control	9	1	RT	0		
2007	3	Control	9	2	RT	0		
2007	3	Control	9	3	RT	0		
2007	3	Control	9	4	RT	0		
2007	3	Control	9	5	RT	0		
2007	3	Control	9	6	RT	0		
2007	3	Control	9	7	RT	0		
2007	1	Grazed	1	1	Filaree	0		
2007	1	Grazed	1	2	Filaree	0		
2007	1	Grazed	1	3	Filaree	0		
2007	1	Grazed	1	4	Filaree	0		
2007	1	Grazed	1	5	Filaree	0		
2007	1	Grazed	1	6	Filaree	0		
2007	1	Grazed	1	7	Filaree	0		
2007	1	Grazed	2	1	Filaree	0		
2007	1	Grazed	2	2	Filaree	0		
2007	1	Grazed	2	3	Filaree	0		
2007	1	Grazed	2	4	Filaree	8		
2007	1	Grazed	2	5	Filaree	0		
2007	1	Grazed	2	6	Filaree	0		
2007	1	Grazed	2	7	Filaree	0		
2007	1	Grazed	3	1	Filaree	0		
2007	1	Grazed	3	2	Filaree	0		
2007	1	Grazed	3	3	Filaree	0		
2007	1	Grazed	3	4	Filaree	0		
2007	1	Grazed	3	5	Filaree	0		
2007	1	Grazed	3	6	Filaree	0		
2007	1	Grazed	3	7	Filaree	0		
2007	2	Grazed	4	1	Filaree	0		
2007	2	Grazed	4	2	Filaree	0		
2007	2	Grazed	4	3	Filaree	0		
2007	2	Grazed	4	4	Filaree	0		
2007	2	Grazed	4	5	Filaree	0		
2007	2	Grazed	4	6	Filaree	0		
2007	2	Grazed	4	7	Filaree	0		
2007	2	Grazed	5	1	Filaree	0		
2007	2	Grazed	5	2	Filaree	0		
2007	2	Grazed	5	3	Filaree	0		
2007	2	Grazed	5	4	Filaree	0		
2007	2	Grazed	5	5	Filaree	0		
2007	2	Grazed	5	6	Filaree	0		
2007	2	Grazed	5	7	Filaree	0		
2007	2	Grazed	6	1	Filaree	0		

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2007	2	Grazed	6	2	Filaree	0		
2007	2	Grazed	6	3	Filaree	0		
2007	2	Grazed	6	4	Filaree	0		
2007	2	Grazed	6	5	Filaree	0		
2007	2	Grazed	6	6	Filaree	0		
2007	2	Grazed	6	7	Filaree	0		
2007	3	Control	7	1	Filaree	0		
2007	3	Control	7	2	Filaree	0		
2007	3	Control	7	3	Filaree	0		
2007	3	Control	7	4	Filaree	0		
2007	3	Control	7	5	Filaree	0		
2007	3	Control	7	6	Filaree	0		
2007	3	Control	7	7	Filaree	0		
2007	3	Control	8	1	Filaree	0		
2007	3	Control	8	2	Filaree	0		
2007	3	Control	8	3	Filaree	0		
2007	3	Control	8	4	Filaree	0		
2007	3	Control	8	5	Filaree	2		
2007	3	Control	8	6	Filaree	4		
2007	3	Control	8	7	Filaree	0		
2007	3	Control	9	1	Filaree	0		
2007	3	Control	9	2	Filaree	0		
2007	3	Control	9	3	Filaree	0		
2007	3	Control	9	4	Filaree	0		
2007	3	Control	9	5	Filaree	0		
2007	3	Control	9	6	Filaree	0		
2007	3	Control	9	7	Filaree	0		
2007	1	Grazed	1	1	Sporalceae	0		
2007	1	Grazed	1	2	Sporalceae	0		
2007	1	Grazed	1	3	Sporalceae	0		
2007	1	Grazed	1	4	Sporalceae	0		
2007	1	Grazed	1	5	Sporalceae	0		
2007	1	Grazed	1	6	Sporalceae	0		
2007	1	Grazed	1	7	Sporalceae	0		
2007	1	Grazed	2	1	Sporalceae	0		
2007	1	Grazed	2	2	Sporalceae	0		
2007	1	Grazed	2	3	Sporalceae	0		
2007	1	Grazed	2	4	Sporalceae	8		
2007	1	Grazed	2	5	Sporalceae	0		
2007	1	Grazed	2	6	Sporalceae	0		
2007	1	Grazed	2	7	Sporalceae	0		
2007	1	Grazed	3	1	Sporalceae	0		
2007	1	Grazed	3	2	Sporalceae	0		
2007	1	Grazed	3	3	Sporalceae	0		
2007	1	Grazed	3	4	Sporalceae	0		
2007	1	Grazed	3	5	Sporalceae	0		
2007	1	Grazed	3	6	Sporalceae	0		
2007	1	Grazed	3	7	Sporalceae	0		

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2007	2	Grazed	4	1	Sporalceae	0		
2007	2	Grazed	4	2	Sporalceae	0		
2007	2	Grazed	4	3	Sporalceae	0		
2007	2	Grazed	4	4	Sporalceae	0		
2007	2	Grazed	4	5	Sporalceae	0		
2007	2	Grazed	4	6	Sporalceae	0		
2007	2	Grazed	4	7	Sporalceae	0		
2007	2	Grazed	5	1	Sporalceae	13		
2007	2	Grazed	5	2	Sporalceae	0		
2007	2	Grazed	5	3	Sporalceae	0		
2007	2	Grazed	5	4	Sporalceae	0		
2007	2	Grazed	5	5	Sporalceae	0		
2007	2	Grazed	5	6	Sporalceae	0		
2007	2	Grazed	5	7	Sporalceae	0		
2007	2	Grazed	6	1	Sporalceae	0		
2007	2	Grazed	6	2	Sporalceae	0		
2007	2	Grazed	6	3	Sporalceae	0		
2007	2	Grazed	6	4	Sporalceae	0		
2007	2	Grazed	6	5	Sporalceae	0		
2007	2	Grazed	6	6	Sporalceae	0		
2007	2	Grazed	6	7	Sporalceae	0		
2007	3	Control	7	1	Sporalceae	0		
2007	3	Control	7	2	Sporalceae	0		
2007	3	Control	7	3	Sporalceae	0		
2007	3	Control	7	4	Sporalceae	0		
2007	3	Control	7	5	Sporalceae	0		
2007	3	Control	7	6	Sporalceae	0		
2007	3	Control	7	7	Sporalceae	0		
2007	3	Control	8	1	Sporalceae	0		
2007	3	Control	8	2	Sporalceae	0		
2007	3	Control	8	3	Sporalceae	0		
2007	3	Control	8	4	Sporalceae	0		
2007	3	Control	8	5	Sporalceae	2		
2007	3	Control	8	6	Sporalceae	0		
2007	3	Control	8	7	Sporalceae	0		
2007	3	Control	9	1	Sporalceae	0		
2007	3	Control	9	2	Sporalceae	0		
2007	3	Control	9	3	Sporalceae	0		
2007	3	Control	9	4	Sporalceae	0		
2007	3	Control	9	5	Sporalceae	0		
2007	3	Control	9	6	Sporalceae	0		
2007	3	Control	9	7	Sporalceae	0		
2008	1	Grazed	1	1	Cheatgrass	568	377.4	0.0
2008	1	Grazed	1	2	Cheatgrass	912	286.4	29.0
2008	1	Grazed	1	3	Cheatgrass	808	128.4	43.0
2008	1	Grazed	1	4	Cheatgrass	120	11.4	0.0
2008	1	Grazed	1	5	Cheatgrass	192	75.5	0.0
2008	1	Grazed	1	6	Cheatgrass	408	71.8	0.0

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2008	1	Grazed	1	7	Cheatgrass	200	18.8	0.0
2008	1	Grazed	2	1	Cheatgrass	152	28.1	0.0
2008	1	Grazed	2	2	Cheatgrass	536	70.8	0.0
2008	1	Grazed	2	3	Cheatgrass	680	90.3	0.0
2008	1	Grazed	2	4	Cheatgrass	808	32.7	16.0
2008	1	Grazed	2	5	Cheatgrass	424	27.2	10.4
2008	1	Grazed	2	6	Cheatgrass	424	96.8	50.4
2008	1	Grazed	2	7	Cheatgrass	184	56.0	0.0
2008	1	Grazed	3	1	Cheatgrass	240	18.8	0.0
2008	1	Grazed	3	2	Cheatgrass	128	8.6	0.0
2008	1	Grazed	3	3	Cheatgrass	136	23.4	0.0
2008	1	Grazed	3	4	Cheatgrass	560	52.2	0.0
2008	1	Grazed	3	5	Cheatgrass	0	0.0	0.0
2008	1	Grazed	3	6	Cheatgrass	104	15.1	0.0
2008	1	Grazed	3	7	Cheatgrass	280	70.8	0.0
2008	2	Grazed	4	1	Cheatgrass	16	0.0	0.0
2008	2	Grazed	4	2	Cheatgrass	16	0.0	9.5
2008	2	Grazed	4	3	Cheatgrass	336	69.0	0.0
2008	2	Grazed	4	4	Cheatgrass	64	48.5	12.3
2008	2	Grazed	4	5	Cheatgrass	344	105.2	9.5
2008	2	Grazed	4	6	Cheatgrass	456	53.2	38.3
2008	2	Grazed	4	7	Cheatgrass	200	31.8	0.0
2008	2	Grazed	5	1	Cheatgrass	184	25.3	52.2
2008	2	Grazed	5	2	Cheatgrass	24	0.0	0.0
2008	2	Grazed	5	3	Cheatgrass	32	0.0	53.2
2008	2	Grazed	5	4	Cheatgrass	296	18.8	9.5
2008	2	Grazed	5	5	Cheatgrass	104	35.5	73.6
2008	2	Grazed	5	6	Cheatgrass	376	50.4	11.4
2008	2	Grazed	5	7	Cheatgrass	1008	135.9	48.5
2008	2	Grazed	6	1	Cheatgrass	72	18.8	0.0
2008	2	Grazed	6	2	Cheatgrass	72	48.5	45.7
2008	2	Grazed	6	3	Cheatgrass	0	0.0	14.2
2008	2	Grazed	6	4	Cheatgrass	584	302.2	11.4
2008	2	Grazed	6	5	Cheatgrass	512	147.9	51.3
2008	2	Grazed	6	6	Cheatgrass	808	126.6	9.5
2008	2	Grazed	6	7	Cheatgrass	600	30.9	9.5
2008	3	Control	7	1	Cheatgrass	264	62.5	62.5
2008	3	Control	7	2	Cheatgrass	1440	416.4	416.4
2008	3	Control	7	3	Cheatgrass	600	159.1	159.1
2008	3	Control	7	4	Cheatgrass	1152	258.5	258.5
2008	3	Control	7	5	Cheatgrass	344	82.9	82.9
2008	3	Control	7	6	Cheatgrass	112	17.9	17.9
2008	3	Control	7	7	Cheatgrass	16	5.8	5.8
2008	3	Control	8	1	Cheatgrass	880	149.8	149.8
2008	3	Control	8	2	Cheatgrass	696	141.4	141.4
2008	3	Control	8	3	Cheatgrass	704	56.9	56.9
2008	3	Control	8	4	Cheatgrass	912	232.5	232.5
2008	3	Control	8	5	Cheatgrass	704	128.4	128.4

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2008	3	Control	8	6	Cheatgrass	592	152.6	152.6
2008	3	Control	8	7	Cheatgrass	544	140.5	140.5
2008	3	Control	9	1	Cheatgrass	400	36.5	36.5
2008	3	Control	9	2	Cheatgrass	8	0.0	0.0
2008	3	Control	9	3	Cheatgrass	168	0.0	0.0
2008	3	Control	9	4	Cheatgrass	648	32.7	32.7
2008	3	Control	9	5	Cheatgrass	592	325.4	325.4
2008	3	Control	9	6	Cheatgrass	328	113.6	113.6
2008	3	Control	9	7	Cheatgrass	136	9.5	9.5
2008	1	Grazed	1	1	Crested	3	373.7	136.8
2008	1	Grazed	1	2	Crested	0	0.0	147.0
2008	1	Grazed	1	3	Crested	0	0.0	0.0
2008	1	Grazed	1	4	Crested	0	0.0	338.4
2008	1	Grazed	1	5	Crested	0	0.0	150.7
2008	1	Grazed	1	6	Crested	1	425.7	592.0
2008	1	Grazed	1	7	Crested	0	0.0	0.0
2008	1	Grazed	2	1	Crested	1	122.9	0.0
2008	1	Grazed	2	2	Crested	0	0.0	0.0
2008	1	Grazed	2	3	Crested	0	0.0	2.1
2008	1	Grazed	2	4	Crested	0	0.0	158.2
2008	1	Grazed	2	5	Crested	4	462.9	0.0
2008	1	Grazed	2	6	Crested	0	0.0	0.0
2008	1	Grazed	2	7	Crested	1	106.1	0.0
2008	1	Grazed	3	1	Crested	4	561.4	295.7
2008	1	Grazed	3	2	Crested	4	907.9	363.5
2008	1	Grazed	3	3	Crested	2	451.7	443.4
2008	1	Grazed	3	4	Crested	3	177.7	95.0
2008	1	Grazed	3	5	Crested	5	778.7	0.0
2008	1	Grazed	3	6	Crested	2	272.4	150.7
2008	1	Grazed	3	7	Crested	1	194.4	265.9
2008	2	Grazed	4	1	Crested	0	0.0	0.0
2008	2	Grazed	4	2	Crested	0	0.0	0.0
2008	2	Grazed	4	3	Crested	0	0.0	0.0
2008	2	Grazed	4	4	Crested	2	431.3	0.0
2008	2	Grazed	4	5	Crested	0	0.0	0.0
2008	2	Grazed	4	6	Crested	0	0.0	168.4
2008	2	Grazed	4	7	Crested	0	0.0	0.0
2008	2	Grazed	5	1	Crested	0	0.0	0.0
2008	2	Grazed	5	2	Crested	0	0.0	0.0
2008	2	Grazed	5	3	Crested	0	0.0	0.0
2008	2	Grazed	5	4	Crested	0	0.0	0.0
2008	2	Grazed	5	5	Crested	0	0.0	16.0
2008	2	Grazed	5	6	Crested	0	0.0	0.0
2008	2	Grazed	5	7	Crested	2	291.0	0.0
2008	2	Grazed	6	1	Crested	0	0.0	0.0
2008	2	Grazed	6	2	Crested	0	0.0	0.0
2008	2	Grazed	6	3	Crested	0	0.0	0.0
2008	2	Grazed	6	4	Crested	0	0.0	0.0

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2008	2	Grazed	6	5	Crested	0	0.0	3.0
2008	2	Grazed	6	6	Crested	0	0.0	0.0
2008	2	Grazed	6	7	Crested	1	349.5	0.0
2008	3	Control	7	1	Crested	5	525.1	525.1
2008	3	Control	7	2	Crested	0	0.0	0.0
2008	3	Control	7	3	Crested	0	0.0	0.0
2008	3	Control	7	4	Crested	0	0.0	0.0
2008	3	Control	7	5	Crested	1	344.0	344.0
2008	3	Control	7	6	Crested	3	357.9	357.9
2008	3	Control	7	7	Crested	1	191.6	191.6
2008	3	Control	8	1	Crested	0	0.0	0.0
2008	3	Control	8	2	Crested	0	0.0	0.0
2008	3	Control	8	3	Crested	1	202.8	202.8
2008	3	Control	8	4	Crested	0	0.0	0.0
2008	3	Control	8	5	Crested	0	0.0	0.0
2008	3	Control	8	6	Crested	3	430.4	430.4
2008	3	Control	8	7	Crested	1	332.8	332.8
2008	3	Control	9	1	Crested	1	354.2	354.2
2008	3	Control	9	2	Crested	3	374.6	374.6
2008	3	Control	9	3	Crested	0	0.0	0.0
2008	3	Control	9	4	Crested	4	273.4	273.4
2008	3	Control	9	5	Crested	1	307.7	307.7
2008	3	Control	9	6	Crested	0	0.0	0.0
2008	3	Control	9	7	Crested	10	725.8	725.8
2008	1	Grazed	1	1	Sandberg	0	0.0	0.0
2008	1	Grazed	1	2	Sandberg	0	0.0	0.0
2008	1	Grazed	1	3	Sandberg	3	0.0	0.0
2008	1	Grazed	1	4	Sandberg	12	44.8	0.2
2008	1	Grazed	1	5	Sandberg	6	8.6	3.9
2008	1	Grazed	1	6	Sandberg	7	12.3	0.0
2008	1	Grazed	1	7	Sandberg	4	16.0	0.0
2008	1	Grazed	2	1	Sandberg	5	19.7	2.1
2008	1	Grazed	2	2	Sandberg	27	48.5	0.0
2008	1	Grazed	2	3	Sandberg	14	58.8	3.9
2008	1	Grazed	2	4	Sandberg	1	0.0	0.0
2008	1	Grazed	2	5	Sandberg	8	14.2	0.0
2008	1	Grazed	2	6	Sandberg	8	17.9	0.0
2008	1	Grazed	2	7	Sandberg	41	45.7	0.0
2008	1	Grazed	3	1	Sandberg	28	43.0	18.8
2008	1	Grazed	3	2	Sandberg	8	0.0	7.7
2008	1	Grazed	3	3	Sandberg	0	0.0	0.0
2008	1	Grazed	3	4	Sandberg	5	7.7	0.0
2008	1	Grazed	3	5	Sandberg	0	0.0	0.0
2008	1	Grazed	3	6	Sandberg	12	14.2	0.0
2008	1	Grazed	3	7	Sandberg	1	8.6	11.4
2008	2	Grazed	4	1	Sandberg	2	5.8	0.0
2008	2	Grazed	4	2	Sandberg	20	50.4	0.0
2008	2	Grazed	4	3	Sandberg	8	16.9	6.7

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2008	2	Grazed	4	4	Sandberg	1	35.5	1.2
2008	2	Grazed	4	5	Sandberg	13	36.5	3.0
2008	2	Grazed	4	6	Sandberg	52	75.5	0.0
2008	2	Grazed	4	7	Sandberg	0	0.0	19.7
2008	2	Grazed	5	1	Sandberg	29	30.0	0.0
2008	2	Grazed	5	2	Sandberg	0	0.0	0.0
2008	2	Grazed	5	3	Sandberg	4	4.9	0.0
2008	2	Grazed	5	4	Sandberg	4	0.0	0.0
2008	2	Grazed	5	5	Sandberg	5	9.5	0.0
2008	2	Grazed	5	6	Sandberg	12	18.8	0.0
2008	2	Grazed	5	7	Sandberg	14	40.2	0.0
2008	2	Grazed	6	1	Sandberg	0	0.0	0.0
2008	2	Grazed	6	2	Sandberg	0	0.0	0.0
2008	2	Grazed	6	3	Sandberg	1	1.2	0.0
2008	2	Grazed	6	4	Sandberg	0	0.0	0.0
2008	2	Grazed	6	5	Sandberg	0	0.0	0.0
2008	2	Grazed	6	6	Sandberg	1	0.0	0.0
2008	2	Grazed	6	7	Sandberg	8	13.2	1.2
2008	3	Control	7	1	Sandberg	10	56.0	56.0
2008	3	Control	7	2	Sandberg	0	0.0	0.0
2008	3	Control	7	3	Sandberg	1	6.7	6.7
2008	3	Control	7	4	Sandberg	0	0.0	0.0
2008	3	Control	7	5	Sandberg	6	34.6	34.6
2008	3	Control	7	6	Sandberg	11	32.7	32.7
2008	3	Control	7	7	Sandberg	16	30.9	30.9
2008	3	Control	8	1	Sandberg	1	0.0	0.0
2008	3	Control	8	2	Sandberg	17	38.3	38.3
2008	3	Control	8	3	Sandberg	24	51.3	51.3
2008	3	Control	8	4	Sandberg	0	0.0	0.0
2008	3	Control	8	5	Sandberg	7	30.0	30.0
2008	3	Control	8	6	Sandberg	0	0.0	0.0
2008	3	Control	8	7	Sandberg	8	11.4	11.4
2008	3	Control	9	1	Sandberg	16	31.8	31.8
2008	3	Control	9	2	Sandberg	0	46.7	46.7
2008	3	Control	9	3	Sandberg	14	0.0	0.0
2008	3	Control	9	4	Sandberg	10	24.4	24.4
2008	3	Control	9	5	Sandberg	3	12.3	12.3
2008	3	Control	9	6	Sandberg	29	30.9	30.9
2008	3	Control	9	7	Sandberg	0	0.0	0.0
2008	1	Grazed	1	1	Stipa	3	199.0	42
2008	1	Grazed	1	2	Stipa	0	0.0	0
2008	1	Grazed	1	3	Stipa	0	0.0	0
2008	1	Grazed	1	4	Stipa	0	0.0	0
2008	1	Grazed	1	5	Stipa	0	0.0	0
2008	1	Grazed	1	6	Stipa	0	0.0	0
2008	1	Grazed	1	7	Stipa	0	0.0	0
2008	1	Grazed	2	1	Stipa	3	74.5	0
2008	1	Grazed	2	2	Stipa	0	0.0	0

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2008	1	Grazed	2	3	Stipa	4	249.2	0
2008	1	Grazed	2	4	Stipa	0	0.0	0
2008	1	Grazed	2	5	Stipa	0	0.0	0
2008	1	Grazed	2	6	Stipa	0	0.0	0
2008	1	Grazed	2	7	Stipa	0	0.0	0
2008	1	Grazed	3	1	Stipa	0	0.0	0
2008	1	Grazed	3	2	Stipa	0	0.0	0
2008	1	Grazed	3	3	Stipa	1	16.9	0
2008	1	Grazed	3	4	Stipa	4	9.5	0
2008	1	Grazed	3	5	Stipa	0	0.0	0
2008	1	Grazed	3	6	Stipa	3	30.9	0
2008	1	Grazed	3	7	Stipa	0	0.0	0
2008	2	Grazed	4	1	Stipa	0	0.0	0
2008	2	Grazed	4	2	Stipa	0	0.0	0
2008	2	Grazed	4	3	Stipa	0	0.0	0
2008	2	Grazed	4	4	Stipa	0	0.0	0
2008	2	Grazed	4	5	Stipa	0	0.0	0
2008	2	Grazed	4	6	Stipa	0	0.0	0
2008	2	Grazed	4	7	Stipa	0	0.0	0
2008	2	Grazed	5	1	Stipa	0	0.0	0
2008	2	Grazed	5	2	Stipa	0	0.0	0
2008	2	Grazed	5	3	Stipa	0	0.0	0
2008	2	Grazed	5	4	Stipa	0	0.0	0
2008	2	Grazed	5	5	Stipa	0	0.0	0
2008	2	Grazed	5	6	Stipa	0	0.0	0
2008	2	Grazed	5	7	Stipa	0	0.0	0
2008	2	Grazed	6	1	Stipa	0	0.0	0
2008	2	Grazed	6	2	Stipa	0	0.0	0
2008	2	Grazed	6	3	Stipa	0	0.0	0
2008	2	Grazed	6	4	Stipa	0	0.0	0
2008	2	Grazed	6	5	Stipa	0	0.0	0
2008	2	Grazed	6	6	Stipa	0	0.0	0
2008	2	Grazed	6	7	Stipa	0	0.0	0
2008	3	Control	7	1	Stipa	0	0.0	0.0
2008	3	Control	7	2	Stipa	0	0.0	0.0
2008	3	Control	7	3	Stipa	0	0.0	0.0
2008	3	Control	7	4	Stipa	0	0.0	0.0
2008	3	Control	7	5	Stipa	0	0.0	0.0
2008	3	Control	7	6	Stipa	0	0.0	0.0
2008	3	Control	7	7	Stipa	0	0.0	0.0
2008	3	Control	8	1	Stipa	0	0.0	0.0
2008	3	Control	8	2	Stipa	0	0.0	0.0
2008	3	Control	8	3	Stipa	0	0.0	0.0
2008	3	Control	8	4	Stipa	0	0.0	0.0
2008	3	Control	8	5	Stipa	0	0.0	0.0
2008	3	Control	8	6	Stipa	0	0.0	0.0
2008	3	Control	8	7	Stipa	0	0.0	0.0
2008	3	Control	9	1	Stipa	0	0.0	0.0

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2008	3	Control	9	2	Stipa	0	0.0	0.0
2008	3	Control	9	3	Stipa	0	0.0	0.0
2008	3	Control	9	4	Stipa	0	0.0	0.0
2008	3	Control	9	5	Stipa	0	0.0	0.0
2008	3	Control	9	6	Stipa	0	0.0	0.0
2008	3	Control	9	7	Stipa	0	0.0	0.0
2008	1	Grazed	1	1	Rice Grass	0	0.0	0.0
2008	1	Grazed	1	2	Rice Grass	0	0.0	0.0
2008	1	Grazed	1	3	Rice Grass	0	0.0	0.0
2008	1	Grazed	1	4	Rice Grass	1	0.0	0.0
2008	1	Grazed	1	5	Rice Grass	0	0.0	0.0
2008	1	Grazed	1	6	Rice Grass	0	0.0	0.0
2008	1	Grazed	1	7	Rice Grass	0	0.0	0.0
2008	1	Grazed	2	1	Rice Grass	0	0.0	0.0
2008	1	Grazed	2	2	Rice Grass	0	0.0	0.0
2008	1	Grazed	2	3	Rice Grass	0	0.0	0.0
2008	1	Grazed	2	4	Rice Grass	2	0.0	0.0
2008	1	Grazed	2	5	Rice Grass	0	0.0	0.0
2008	1	Grazed	2	6	Rice Grass	0	0.0	0.0
2008	1	Grazed	2	7	Rice Grass	0	0.0	0.0
2008	1	Grazed	3	1	Rice Grass	0	0.0	0.0
2008	1	Grazed	3	2	Rice Grass	0	0.0	0.0
2008	1	Grazed	3	3	Rice Grass	2	16.9	0.0
2008	1	Grazed	3	4	Rice Grass	4	9.5	0.0
2008	1	Grazed	3	5	Rice Grass	0	0.0	0.0
2008	1	Grazed	3	6	Rice Grass	3	30.9	0.0
2008	1	Grazed	3	7	Rice Grass	0	0	0.0
2008	2	Grazed	4	1	Rice Grass	0	0	0.0
2008	2	Grazed	4	2	Rice Grass	0	0	0.0
2008	2	Grazed	4	3	Rice Grass	0	0	0.0
2008	2	Grazed	4	4	Rice Grass	0	0	0.0
2008	2	Grazed	4	5	Rice Grass	0	0	0.0
2008	2	Grazed	4	6	Rice Grass	0	0	0.0
2008	2	Grazed	4	7	Rice Grass	0	0	0.0
2008	2	Grazed	5	1	Rice Grass	0	0	0.0
2008	2	Grazed	5	2	Rice Grass	0	0	0.0
2008	2	Grazed	5	3	Rice Grass	0	0	0.0
2008	2	Grazed	5	4	Rice Grass	0	0	0.0
2008	2	Grazed	5	5	Rice Grass	0	0	0.0
2008	2	Grazed	5	6	Rice Grass	0	0	0.0
2008	2	Grazed	5	7	Rice Grass	0	0	0.0
2008	2	Grazed	6	1	Rice Grass	0	0	0.0
2008	2	Grazed	6	2	Rice Grass	0	0	0.0
2008	2	Grazed	6	3	Rice Grass	0	0	0.0
2008	2	Grazed	6	4	Rice Grass	0	0	0.0
2008	2	Grazed	6	5	Rice Grass	0	0	0.0
2008	2	Grazed	6	6	Rice Grass	0	0	0.0
2008	2	Grazed	6	7	Rice Grass	0	0	0.0

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2008	3	Control	7	1	Rice Grass	0	0	0
2008	3	Control	7	2	Rice Grass	0	0	0
2008	3	Control	7	3	Rice Grass	0	0	0
2008	3	Control	7	4	Rice Grass	0	0	0
2008	3	Control	7	5	Rice Grass	0	0	0
2008	3	Control	7	6	Rice Grass	0	0	0
2008	3	Control	7	7	Rice Grass	0	0	0
2008	3	Control	8	1	Rice Grass	0	0	0
2008	3	Control	8	2	Rice Grass	0	0	0
2008	3	Control	8	3	Rice Grass	0	0	0
2008	3	Control	8	4	Rice Grass	0	0	0
2008	3	Control	8	5	Rice Grass	0	0	0
2008	3	Control	8	6	Rice Grass	0	0	0
2008	3	Control	8	7	Rice Grass	0	0	0
2008	3	Control	9	1	Rice Grass	0	0	0
2008	3	Control	9	2	Rice Grass	0	0	0
2008	3	Control	9	3	Rice Grass	0	0	0
2008	3	Control	9	4	Rice Grass	0	0	0
2008	3	Control	9	5	Rice Grass	0	0	0
2008	3	Control	9	6	Rice Grass	0	0	0
2008	3	Control	9	7	Rice Grass	0	0	0
2008	1	Grazed	1	1	Annual Mustard	0		
2008	1	Grazed	1	2	Annual Mustard	1		
2008	1	Grazed	1	3	Annual Mustard	0		
2008	1	Grazed	1	4	Annual Mustard	51		
2008	1	Grazed	1	5	Annual Mustard	0		
2008	1	Grazed	1	6	Annual Mustard	0		
2008	1	Grazed	1	7	Annual Mustard	7		
2008	1	Grazed	2	1	Annual Mustard	0		
2008	1	Grazed	2	2	Annual Mustard	0		
2008	1	Grazed	2	3	Annual Mustard	0		
2008	1	Grazed	2	4	Annual Mustard	0		
2008	1	Grazed	2	5	Annual Mustard	30		
2008	1	Grazed	2	6	Annual Mustard	2		
2008	1	Grazed	2	7	Annual Mustard	0		
2008	1	Grazed	3	1	Annual Mustard	0		

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2008	1	Grazed	3	2	Annual Mustard	1		
2008	1	Grazed	3	3	Annual Mustard	0		
2008	1	Grazed	3	4	Annual Mustard	10		
2008	1	Grazed	3	5	Annual Mustard	0		
2008	1	Grazed	3	6	Annual Mustard	0		
2008	1	Grazed	3	7	Annual Mustard	0		
2008	2	Grazed	4	1	Annual Mustard	0		
2008	2	Grazed	4	2	Annual Mustard	160		
2008	2	Grazed	4	3	Annual Mustard	13		
2008	2	Grazed	4	4	Annual Mustard	8		
2008	2	Grazed	4	5	Annual Mustard	2		
2008	2	Grazed	4	6	Annual Mustard	0		
2008	2	Grazed	4	7	Annual Mustard	0		
2008	2	Grazed	5	1	Annual Mustard	1		
2008	2	Grazed	5	2	Annual Mustard	1		
2008	2	Grazed	5	3	Annual Mustard	0		
2008	2	Grazed	5	4	Annual Mustard	0		
2008	2	Grazed	5	5	Annual Mustard	1		
2008	2	Grazed	5	6	Annual Mustard	2		
2008	2	Grazed	5	7	Annual Mustard	5		
2008	2	Grazed	6	1	Annual Mustard	0		
2008	2	Grazed	6	2	Annual Mustard	2		
2008	2	Grazed	6	3	Annual Mustard	0		
2008	2	Grazed	6	4	Annual Mustard	5		
2008	2	Grazed	6	5	Annual Mustard	1		
2008	2	Grazed	6	6	Annual Mustard	2		
2008	2	Grazed	6	7	Annual	5		

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2008	3	Control	7	1	Mustard Annual Mustard	1		
2008	3	Control	7	2	Mustard Annual Mustard	3		
2008	3	Control	7	3	Mustard Annual Mustard	0		
2008	3	Control	7	4	Mustard Annual Mustard	7		
2008	3	Control	7	5	Mustard Annual Mustard	0		
2008	3	Control	7	6	Mustard Annual Mustard	2		
2008	3	Control	7	7	Mustard Annual Mustard	0		
2008	3	Control	8	1	Mustard Annual Mustard	3		
2008	3	Control	8	2	Mustard Annual Mustard	0		
2008	3	Control	8	3	Mustard Annual Mustard	1		
2008	3	Control	8	4	Mustard Annual Mustard	0		
2008	3	Control	8	5	Mustard Annual Mustard	0		
2008	3	Control	8	6	Mustard Annual Mustard	0		
2008	3	Control	8	7	Mustard Annual Mustard	4		
2008	3	Control	9	1	Mustard Annual Mustard	1		
2008	3	Control	9	2	Mustard Annual Mustard	0		
2008	3	Control	9	3	Mustard Annual Mustard	3		
2008	3	Control	9	4	Mustard Annual Mustard	3		
2008	3	Control	9	5	Mustard Annual Mustard	1		
2008	3	Control	9	6	Mustard Annual Mustard	0		
2008	3	Control	9	7	Mustard	0		
2008	1	Grazed	1	1	RT	0		
2008	1	Grazed	1	2	RT	2		
2008	1	Grazed	1	3	RT	16		
2008	1	Grazed	1	4	RT	48		
2008	1	Grazed	1	5	RT	109		
2008	1	Grazed	1	6	RT	107		
2008	1	Grazed	1	7	RT	63		
2008	1	Grazed	2	1	RT	0		
2008	1	Grazed	2	2	RT	92		

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2008	1	Grazed	2	3	RT	30		
2008	1	Grazed	2	4	RT	54		
2008	1	Grazed	2	5	RT	44		
2008	1	Grazed	2	6	RT	62		
2008	1	Grazed	2	7	RT	88		
2008	1	Grazed	3	1	RT	98		
2008	1	Grazed	3	2	RT	10		
2008	1	Grazed	3	3	RT	5		
2008	1	Grazed	3	4	RT	25		
2008	1	Grazed	3	5	RT	25		
2008	1	Grazed	3	6	RT	3		
2008	1	Grazed	3	7	RT	46		
2008	2	Grazed	4	1	RT	5		
2008	2	Grazed	4	2	RT	1		
2008	2	Grazed	4	3	RT	0		
2008	2	Grazed	4	4	RT	2		
2008	2	Grazed	4	5	RT	0		
2008	2	Grazed	4	6	RT	6		
2008	2	Grazed	4	7	RT	28		
2008	2	Grazed	5	1	RT	0		
2008	2	Grazed	5	2	RT	1		
2008	2	Grazed	5	3	RT	1		
2008	2	Grazed	5	4	RT	1		
2008	2	Grazed	5	5	RT	6		
2008	2	Grazed	5	6	RT	0		
2008	2	Grazed	5	7	RT	0		
2008	2	Grazed	6	1	RT	1		
2008	2	Grazed	6	2	RT	3		
2008	2	Grazed	6	3	RT	1		
2008	2	Grazed	6	4	RT	0		
2008	2	Grazed	6	5	RT	0		
2008	2	Grazed	6	6	RT	5		
2008	2	Grazed	6	7	RT	0		
2008	3	Control	7	1	RT	2		
2008	3	Control	7	2	RT	1		
2008	3	Control	7	3	RT	10		
2008	3	Control	7	4	RT	2		
2008	3	Control	7	5	RT	6		
2008	3	Control	7	6	RT	0		
2008	3	Control	7	7	RT	10		
2008	3	Control	8	1	RT	11		
2008	3	Control	8	2	RT	3		
2008	3	Control	8	3	RT	13		
2008	3	Control	8	4	RT	1		
2008	3	Control	8	5	RT	0		
2008	3	Control	8	6	RT	2		
2008	3	Control	8	7	RT	1		
2008	3	Control	9	1	RT	0		

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2008	3	Control	9	2	RT	0		
2008	3	Control	9	3	RT	0		
2008	3	Control	9	4	RT	11		
2008	3	Control	9	5	RT	0		
2008	3	Control	9	6	RT	0		
2008	3	Control	9	7	RT	0		
2008	1	Grazed	1	1	Filaree	0		
2008	1	Grazed	1	2	Filaree	0		
2008	1	Grazed	1	3	Filaree	0		
2008	1	Grazed	1	4	Filaree	0		
2008	1	Grazed	1	5	Filaree	0		
2008	1	Grazed	1	6	Filaree	0		
2008	1	Grazed	1	7	Filaree	0		
2008	1	Grazed	2	1	Filaree	0		
2008	1	Grazed	2	2	Filaree	0		
2008	1	Grazed	2	3	Filaree	0		
2008	1	Grazed	2	4	Filaree	16		
2008	1	Grazed	2	5	Filaree	0		
2008	1	Grazed	2	6	Filaree	0		
2008	1	Grazed	2	7	Filaree	0		
2008	1	Grazed	3	1	Filaree	0		
2008	1	Grazed	3	2	Filaree	0		
2008	1	Grazed	3	3	Filaree	0		
2008	1	Grazed	3	4	Filaree	0		
2008	1	Grazed	3	5	Filaree	0		
2008	1	Grazed	3	6	Filaree	0		
2008	1	Grazed	3	7	Filaree	0		
2008	2	Grazed	4	1	Filaree	0		
2008	2	Grazed	4	2	Filaree	0		
2008	2	Grazed	4	3	Filaree	0		
2008	2	Grazed	4	4	Filaree	0		
2008	2	Grazed	4	5	Filaree	0		
2008	2	Grazed	4	6	Filaree	0		
2008	2	Grazed	4	7	Filaree	0		
2008	2	Grazed	5	1	Filaree	0		
2008	2	Grazed	5	2	Filaree	0		
2008	2	Grazed	5	3	Filaree	0		
2008	2	Grazed	5	4	Filaree	0		
2008	2	Grazed	5	5	Filaree	0		
2008	2	Grazed	5	6	Filaree	0		
2008	2	Grazed	5	7	Filaree	0		
2008	2	Grazed	6	1	Filaree	0		
2008	2	Grazed	6	2	Filaree	0		
2008	2	Grazed	6	3	Filaree	0		
2008	2	Grazed	6	4	Filaree	0		
2008	2	Grazed	6	5	Filaree	0		
2008	2	Grazed	6	6	Filaree	0		
2008	2	Grazed	6	7	Filaree	0		

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2008	3	Control	7	1	Filaree	0		
2008	3	Control	7	2	Filaree	0		
2008	3	Control	7	3	Filaree	0		
2008	3	Control	7	4	Filaree	0		
2008	3	Control	7	5	Filaree	7		
2008	3	Control	7	6	Filaree	0		
2008	3	Control	7	7	Filaree	0		
2008	3	Control	8	1	Filaree	0		
2008	3	Control	8	2	Filaree	0		
2008	3	Control	8	3	Filaree	0		
2008	3	Control	8	4	Filaree	7		
2008	3	Control	8	5	Filaree	14		
2008	3	Control	8	6	Filaree	0		
2008	3	Control	8	7	Filaree	0		
2008	3	Control	9	1	Filaree	0		
2008	3	Control	9	2	Filaree	0		
2008	3	Control	9	3	Filaree	0		
2008	3	Control	9	4	Filaree	1		
2008	3	Control	9	5	Filaree	1		
2008	3	Control	9	6	Filaree	0		
2008	3	Control	9	7	Filaree	0		
2008	1	Grazed	1	1	Sporalceae	0		
2008	1	Grazed	1	2	Sporalceae	0		
2008	1	Grazed	1	3	Sporalceae	1		
2008	1	Grazed	1	4	Sporalceae	4		
2008	1	Grazed	1	5	Sporalceae	0		
2008	1	Grazed	1	6	Sporalceae	0		
2008	1	Grazed	1	7	Sporalceae	0		
2008	1	Grazed	2	1	Sporalceae	0		
2008	1	Grazed	2	2	Sporalceae	0		
2008	1	Grazed	2	3	Sporalceae	0		
2008	1	Grazed	2	4	Sporalceae	0		
2008	1	Grazed	2	5	Sporalceae	3		
2008	1	Grazed	2	6	Sporalceae	0		
2008	1	Grazed	2	7	Sporalceae	0		
2008	1	Grazed	3	1	Sporalceae	1		
2008	1	Grazed	3	2	Sporalceae	0		
2008	1	Grazed	3	3	Sporalceae	0		
2008	1	Grazed	3	4	Sporalceae	0		
2008	1	Grazed	3	5	Sporalceae	0		
2008	1	Grazed	3	6	Sporalceae	0		
2008	1	Grazed	3	7	Sporalceae	0		
2008	2	Grazed	4	1	Sporalceae	0		
2008	2	Grazed	4	2	Sporalceae	0		
2008	2	Grazed	4	3	Sporalceae	0		
2008	2	Grazed	4	4	Sporalceae	0		
2008	2	Grazed	4	5	Sporalceae	0		
2008	2	Grazed	4	6	Sporalceae	0		

Year	Area	Treatment	Transect	Quadrat	Species	Density	Biomass Pre-graze	Biomass Post Graze
2008	2	Grazed	4	7	Sporalceae	0		
2008	2	Grazed	5	1	Sporalceae	0		
2008	2	Grazed	5	2	Sporalceae	0		
2008	2	Grazed	5	3	Sporalceae	0		
2008	2	Grazed	5	4	Sporalceae	0		
2008	2	Grazed	5	5	Sporalceae	0		
2008	2	Grazed	5	6	Sporalceae	2		
2008	2	Grazed	5	7	Sporalceae	0		
2008	2	Grazed	6	1	Sporalceae	0		
2008	2	Grazed	6	2	Sporalceae	0		
2008	2	Grazed	6	3	Sporalceae	0		
2008	2	Grazed	6	4	Sporalceae	0		
2008	2	Grazed	6	5	Sporalceae	0		
2008	2	Grazed	6	6	Sporalceae	2		
2008	2	Grazed	6	7	Sporalceae	0		
2008	3	Control	7	1	Sporalceae	2		
2008	3	Control	7	2	Sporalceae	0		
2008	3	Control	7	3	Sporalceae	0		
2008	3	Control	7	4	Sporalceae	0		
2008	3	Control	7	5	Sporalceae	2		
2008	3	Control	7	6	Sporalceae	0		
2008	3	Control	7	7	Sporalceae	0		
2008	3	Control	8	1	Sporalceae	0		
2008	3	Control	8	2	Sporalceae	0		
2008	3	Control	8	3	Sporalceae	0		
2008	3	Control	8	4	Sporalceae	1		
2008	3	Control	8	5	Sporalceae	0		
2008	3	Control	8	6	Sporalceae	0		
2008	3	Control	8	7	Sporalceae	3		
2008	3	Control	9	1	Sporalceae	2		
2008	3	Control	9	2	Sporalceae	3		
2008	3	Control	9	3	Sporalceae	0		
2008	3	Control	9	4	Sporalceae	0		
2008	3	Control	9	5	Sporalceae	0		
2008	3	Control	9	6	Sporalceae	0		
2008	3	Control	9	7	Sporalceae	0		

Year	Transect	Treatment	Area	Category	Cover
2007	1	Grazed	1	Bare Ground	10.7
2007	1	Grazed	1	Litter	46.7
2007	1	Grazed	1	Gravel	12.7
2007	1	Grazed	1	Cheat Grass	22.0
2007	1	Grazed	1	Sandberg	2.0
2007	1	Grazed	1	Crested	3.3
2007	1	Grazed	1	Needle and Thread	0.7
2007	1	Grazed	1	annual	2.0
2007	2	Grazed	1	Bare Ground	15.3
2007	2	Grazed	1	Litter	50.7
2007	2	Grazed	1	Gravel	8.7
2007	2	Grazed	1	Cheat Grass	18.7
2007	2	Grazed	1	Sandberg	3.3
2007	2	Grazed	1	Crested	0.0
2007	2	Grazed	1	Needle and Thread	0.0
2007	2	Grazed	1	annual	3.3
2007	3	Grazed	1	Bare Ground	10.7
2007	3	Grazed	1	Litter	55.3
2007	3	Grazed	1	Gravel	7.3
2007	3	Grazed	1	Cheat Grass	14.7
2007	3	Grazed	1	Sandberg	4.7
2007	3	Grazed	1	Crested	0.7
2007	3	Grazed	1	Needle and Thread	1.3
2007	3	Grazed	1	annual	5.3
2007	4	Grazed	2	Bare Ground	14.7
2007	4	Grazed	2	Litter	54.7
2007	4	Grazed	2	Gravel	1.3
2007	4	Grazed	2	Cheat Grass	16.0
2007	4	Grazed	2	Sandberg	7.3
2007	4	Grazed	2	Crested	0.0
2007	4	Grazed	2	Needle and Thread	0.0
2007	4	Grazed	2	annual	6.0
2007	5	Grazed	2	Bare Ground	6.7
2007	5	Grazed	2	Litter	62.7
2007	5	Grazed	2	Gravel	1.3
2007	5	Grazed	2	Cheat Grass	24.7
2007	5	Grazed	2	Sandberg	2.0
2007	5	Grazed	2	Crested	0.0
2007	5	Grazed	2	Needle and Thread	0.0
2007	5	Grazed	2	annual	2.7
2007	6	Grazed	2	Bare Ground	6.7
2007	6	Grazed	2	Litter	54.7

Year	Transect	Treatment	Area	Category	Cover
2007	6	Grazed	2	Gravel	2.7
2007	6	Grazed	2	Cheat Grass	28.7
2007	6	Grazed	2	Sandberg	2.0
2007	6	Grazed	2	Crested	1.3
2007	6	Grazed	2	Needle and Thread	0.0
2007	6	Grazed	2	annual	4.0
2007	7	Control	3	Bare Ground	10.0
2007	7	Control	3	Litter	63.3
2007	7	Control	3	Gravel	3.3
2007	7	Control	3	Cheat Grass	19.3
2007	7	Control	3	Sandberg	1.3
2007	7	Control	3	Crested	0.7
2007	7	Control	3	Needle and Thread	0.0
2007	7	Control	3	annual	2.0
2007	8	Control	3	Bare Ground	5.3
2007	8	Control	3	Litter	62.7
2007	8	Control	3	Gravel	1.3
2007	8	Control	3	Cheat Grass	21.3
2007	8	Control	3	Sandberg	3.3
2007	8	Control	3	Crested	3.3
2007	8	Control	3	Needle and Thread	1.3
2007	8	Control	3	annual	1.3
2007	9	Control	3	Bare Ground	8.0
2007	9	Control	3	Litter	62.0
2007	9	Control	3	Gravel	4.7
2007	9	Control	3	Cheat Grass	19.3
2007	9	Control	3	Sandberg	4.0
2007	9	Control	3	Crested	0.7
2007	9	Control	3	Needle and Thread	0.0
2007	9	Control	3	annual	1.3
2008	1	Grazed	1	Bare Ground	4.7
2008	1	Grazed	1	Litter	46.0
2008	1	Grazed	1	Gravel	14.0
2008	1	Grazed	1	Cheat Grass	24.7
2008	1	Grazed	1	Sandberg	4.0
2008	1	Grazed	1	Crested	0.7
2008	1	Grazed	1	Needle and Thread	1.3
2008	1	Grazed	1	annual	4.7
2008	2	Grazed	1	Bare Ground	5.3
2008	2	Grazed	1	Litter	55.3
2008	2	Grazed	1	Gravel	9.3
2008	2	Grazed	1	Cheat Grass	22.7

Year	Transect	Treatment	Area	Category	Cover
2008	2	Grazed	1	Sandberg	2.7
2008	2	Grazed	1	Crested	0.7
2008	2	Grazed	1	Needle and Thread	0.7
2008	2	Grazed	1	annual	3.3
2008	3	Grazed	1	Bare Ground	8.0
2008	3	Grazed	1	Litter	60.7
2008	3	Grazed	1	Gravel	8.7
2008	3	Grazed	1	Cheat Grass	6.0
2008	3	Grazed	1	Sandberg	5.3
2008	3	Grazed	1	Crested	6.0
2008	3	Grazed	1	Needle and Thread	0.0
2008	3	Grazed	1	annual	5.3
2008	4	Grazed	2	Bare Ground	16.0
2008	4	Grazed	2	Litter	61.3
2008	4	Grazed	2	Gravel	6.0
2008	4	Grazed	2	Cheat Grass	8.7
2008	4	Grazed	2	Sandberg	5.3
2008	4	Grazed	2	Crested	2.0
2008	4	Grazed	2	Needle and Thread	0.0
2008	4	Grazed	2	annual	0.7
2008	5	Grazed	2	Bare Ground	15.3
2008	5	Grazed	2	Litter	58.7
2008	5	Grazed	2	Gravel	2.0
2008	5	Grazed	2	Cheat Grass	17.3
2008	5	Grazed	2	Sandberg	5.3
2008	5	Grazed	2	Crested	0.7
2008	5	Grazed	2	Needle and Thread	0.0
2008	5	Grazed	2	annual	0.7
2008	6	Grazed	2	Bare Ground	20.0
2008	6	Grazed	2	Litter	64.7
2008	6	Grazed	2	Gravel	3.3
2008	6	Grazed	2	Cheat Grass	10.7
2008	6	Grazed	2	Sandberg	1.3
2008	6	Grazed	2	Crested	0.0
2008	6	Grazed	2	Needle and Thread	0.0
2008	6	Grazed	2	annual	0.0
2008	7	Control	3	Bare Ground	25.3
2008	7	Control	3	Litter	48.7
2008	7	Control	3	Gravel	0.0
2008	7	Control	3	Cheat Grass	23.3
2008	7	Control	3	Sandberg	0.7
2008	7	Control	3	Crested	1.3

Year	Transect	Treatment	Area	Category	Cover
2008	7	Control	3	Needle and Thread	0.7
2008	7	Control	3	annual	0.0
2008	8	Control	3	Bare Ground	32.0
2008	8	Control	3	Litter	42.7
2008	8	Control	3	Gravel	0.7
2008	8	Control	3	Cheat Grass	21.3
2008	8	Control	3	Sandberg	0.7
2008	8	Control	3	Crested	0.7
2008	8	Control	3	Needle and Thread	2.0
2008	8	Control	3	annual	0.0
2008	9	Control	3	Bare Ground	17.3
2008	9	Control	3	Litter	52.0
2008	9	Control	3	Gravel	0.7
2008	9	Control	3	Cheat Grass	22.0
2008	9	Control	3	Sandberg	4.0
2008	9	Control	3	Crested	2.0
2008	9	Control	3	Needle and Thread	0.0
2008	9	Control	3	annual	2.0

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2007	1	1	Grazed	CHEAT GRASS	94
2007	1	1	Grazed	CHEAT GRASS	91
2007	1	1	Grazed	CHEAT GRASS	96
2007	1	1	Grazed	CHEAT GRASS	81
2007	1	1	Grazed	CHEAT GRASS	124
2007	1	1	Grazed	CHEAT GRASS	303
2007	1	1	Grazed	CHEAT GRASS	169
2007	1	1	Grazed	CHEAT GRASS	249
2007	1	1	Grazed	CHEAT GRASS	240
2007	1	1	Grazed	CHEAT GRASS	183
2007	1	2	Grazed	CHEAT GRASS	2
2007	1	2	Grazed	CHEAT GRASS	150
2007	1	2	Grazed	CHEAT GRASS	75
2007	1	2	Grazed	CHEAT GRASS	145
2007	1	2	Grazed	CHEAT GRASS	0
2007	1	2	Grazed	CHEAT GRASS	97
2007	1	2	Grazed	CHEAT GRASS	82
2007	1	2	Grazed	CHEAT GRASS	147
2007	1	2	Grazed	CHEAT GRASS	108
2007	1	2	Grazed	CHEAT GRASS	198
2007	1	3	Grazed	CHEAT GRASS	93
2007	1	3	Grazed	CHEAT GRASS	101
2007	1	3	Grazed	CHEAT GRASS	50
2007	1	3	Grazed	CHEAT GRASS	70
2007	1	3	Grazed	CHEAT GRASS	72
2007	1	3	Grazed	CHEAT GRASS	121
2007	1	3	Grazed	CHEAT GRASS	188
2007	1	3	Grazed	CHEAT GRASS	331
2007	1	3	Grazed	CHEAT GRASS	300
2007	1	3	Grazed	CHEAT GRASS	72
2007	2	4	Grazed	CHEAT GRASS	305
2007	2	4	Grazed	CHEAT GRASS	137
2007	2	4	Grazed	CHEAT GRASS	120
2007	2	4	Grazed	CHEAT GRASS	59
2007	2	4	Grazed	CHEAT GRASS	52
2007	2	4	Grazed	CHEAT GRASS	13
2007	2	4	Grazed	CHEAT GRASS	58
2007	2	4	Grazed	CHEAT GRASS	18
2007	2	4	Grazed	CHEAT GRASS	45
2007	2	4	Grazed	CHEAT GRASS	75
2007	2	5	Grazed	CHEAT GRASS	51
2007	2	5	Grazed	CHEAT GRASS	52
2007	2	5	Grazed	CHEAT GRASS	188
2007	2	5	Grazed	CHEAT GRASS	91

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2007	2	5	Grazed	CHEAT GRASS	50
2007	2	5	Grazed	CHEAT GRASS	24
2007	2	5	Grazed	CHEAT GRASS	25
2007	2	5	Grazed	CHEAT GRASS	55
2007	2	5	Grazed	CHEAT GRASS	21
2007	2	5	Grazed	CHEAT GRASS	36
2007	2	6	Grazed	CHEAT GRASS	50
2007	2	6	Grazed	CHEAT GRASS	121
2007	2	6	Grazed	CHEAT GRASS	55
2007	2	6	Grazed	CHEAT GRASS	39
2007	2	6	Grazed	CHEAT GRASS	70
2007	2	6	Grazed	CHEAT GRASS	50
2007	2	6	Grazed	CHEAT GRASS	260
2007	2	6	Grazed	CHEAT GRASS	142
2007	2	6	Grazed	CHEAT GRASS	37
2007	2	6	Grazed	CHEAT GRASS	88
2007	3	7	Control	CHEAT GRASS	40
2007	3	7	Control	CHEAT GRASS	82
2007	3	7	Control	CHEAT GRASS	74
2007	3	7	Control	CHEAT GRASS	53
2007	3	7	Control	CHEAT GRASS	137
2007	3	7	Control	CHEAT GRASS	39
2007	3	7	Control	CHEAT GRASS	95
2007	3	7	Control	CHEAT GRASS	109
2007	3	7	Control	CHEAT GRASS	59
2007	3	7	Control	CHEAT GRASS	15
2007	3	8	Control	CHEAT GRASS	300
2007	3	8	Control	CHEAT GRASS	239
2007	3	8	Control	CHEAT GRASS	100
2007	3	8	Control	CHEAT GRASS	147
2007	3	8	Control	CHEAT GRASS	108
2007	3	8	Control	CHEAT GRASS	58
2007	3	8	Control	CHEAT GRASS	81
2007	3	8	Control	CHEAT GRASS	4
2007	3	8	Control	CHEAT GRASS	89
2007	3	8	Control	CHEAT GRASS	151
2007	3	9	Control	CHEAT GRASS	203
2007	3	9	Control	CHEAT GRASS	45
2007	3	9	Control	CHEAT GRASS	60
2007	3	9	Control	CHEAT GRASS	27
2007	3	9	Control	CHEAT GRASS	46
2007	3	9	Control	CHEAT GRASS	69
2007	3	9	Control	CHEAT GRASS	61
2007	3	9	Control	CHEAT GRASS	62

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2007	3	9	Control	CHEAT GRASS	30
2007	3	9	Control	CHEAT GRASS	92
2007	1	1	Grazed	Annual MUSTARD	8
2007	1	1	Grazed	Annual MUSTARD	1
2007	1	1	Grazed	Annual MUSTARD	11
2007	1	1	Grazed	Annual MUSTARD	3
2007	1	1	Grazed	Annual MUSTARD	0
2007	1	1	Grazed	Annual MUSTARD	3
2007	1	1	Grazed	Annual MUSTARD	5
2007	1	1	Grazed	Annual MUSTARD	0
2007	1	1	Grazed	Annual MUSTARD	3
2007	1	1	Grazed	Annual MUSTARD	9
2007	1	2	Grazed	Annual MUSTARD	4
2007	1	2	Grazed	Annual MUSTARD	1
2007	1	2	Grazed	Annual MUSTARD	0
2007	1	2	Grazed	Annual MUSTARD	17
2007	1	2	Grazed	Annual MUSTARD	0
2007	1	2	Grazed	Annual MUSTARD	1
2007	1	2	Grazed	Annual MUSTARD	0
2007	1	2	Grazed	Annual MUSTARD	0
2007	1	2	Grazed	Annual MUSTARD	0
2007	1	2	Grazed	Annual MUSTARD	0
2007	1	3	Grazed	Annual MUSTARD	1
2007	1	3	Grazed	Annual MUSTARD	2
2007	1	3	Grazed	Annual MUSTARD	0

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2007	1	3	Grazed	Annual MUSTARD	5
2007	1	3	Grazed	Annual MUSTARD	0
2007	1	3	Grazed	Annual MUSTARD	1
2007	1	3	Grazed	Annual MUSTARD	5
2007	1	3	Grazed	Annual MUSTARD	0
2007	1	3	Grazed	Annual MUSTARD	3
2007	1	3	Grazed	Annual MUSTARD	3
2007	2	4	Grazed	Annual MUSTARD	6
2007	2	4	Grazed	Annual MUSTARD	4
2007	2	4	Grazed	Annual MUSTARD	6
2007	2	4	Grazed	Annual MUSTARD	3
2007	2	4	Grazed	Annual MUSTARD	2
2007	2	4	Grazed	Annual MUSTARD	7
2007	2	4	Grazed	Annual MUSTARD	28
2007	2	4	Grazed	Annual MUSTARD	33
2007	2	4	Grazed	Annual MUSTARD	52
2007	2	4	Grazed	Annual MUSTARD	12
2007	2	5	Grazed	Annual MUSTARD	1
2007	2	5	Grazed	Annual MUSTARD	4
2007	2	5	Grazed	Annual MUSTARD	51
2007	2	5	Grazed	Annual MUSTARD	1
2007	2	5	Grazed	Annual MUSTARD	0
2007	2	5	Grazed	Annual MUSTARD	1
2007	2	5	Grazed	Annual MUSTARD	21
2007	2	5	Grazed	Annual	17

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2007	2	5	Grazed	MUSTARD Annual	0
2007	2	5	Grazed	MUSTARD Annual	0
2007	2	6	Grazed	MUSTARD Annual	20
2007	2	6	Grazed	MUSTARD Annual	8
2007	2	6	Grazed	MUSTARD Annual	0
2007	2	6	Grazed	MUSTARD Annual	12
2007	2	6	Grazed	MUSTARD Annual	69
2007	2	6	Grazed	MUSTARD Annual	1
2007	2	6	Grazed	MUSTARD Annual	25
2007	2	6	Grazed	MUSTARD Annual	9
2007	2	6	Grazed	MUSTARD Annual	11
2007	2	6	Grazed	MUSTARD Annual	18
2007	3	7	Control	MUSTARD Annual	6
2007	3	7	Control	MUSTARD Annual	7
2007	3	7	Control	MUSTARD Annual	0
2007	3	7	Control	MUSTARD Annual	0
2007	3	7	Control	MUSTARD Annual	7
2007	3	7	Control	MUSTARD Annual	17
2007	3	7	Control	MUSTARD Annual	2
2007	3	7	Control	MUSTARD Annual	8
2007	3	7	Control	MUSTARD Annual	12
2007	3	7	Control	MUSTARD Annual	1
2007	3	8	Control	MUSTARD Annual	7
2007	3	8	Control	MUSTARD	3

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2007	3	8	Control	Annual MUSTARD	0
2007	3	8	Control	Annual MUSTARD	4
2007	3	8	Control	Annual MUSTARD	0
2007	3	8	Control	Annual MUSTARD	1
2007	3	8	Control	Annual MUSTARD	1
2007	3	8	Control	Annual MUSTARD	2
2007	3	8	Control	Annual MUSTARD	0
2007	3	8	Control	Annual MUSTARD	2
2007	3	9	Control	Annual MUSTARD	0
2007	3	9	Control	Annual MUSTARD	3
2007	3	9	Control	Annual MUSTARD	11
2007	3	9	Control	Annual MUSTARD	0
2007	3	9	Control	Annual MUSTARD	3
2007	3	9	Control	Annual MUSTARD	2
2007	3	9	Control	Annual MUSTARD	6
2007	3	9	Control	Annual MUSTARD	0
2007	3	9	Control	Annual MUSTARD	8
2007	3	9	Control	Annual MUSTARD	7
2007	1	1	Grazed	Annuals	1
2007	1	1	Grazed	Annuals	0
2007	1	1	Grazed	Annuals	4
2007	1	1	Grazed	Annuals	0
2007	1	1	Grazed	Annuals	9
2007	1	1	Grazed	Annuals	13
2007	1	1	Grazed	Annuals	0
2007	1	1	Grazed	Annuals	0
2007	1	1	Grazed	Annuals	3
2007	1	1	Grazed	Annuals	6
2007	1	2	Grazed	Annuals	0

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2007	1	2	Grazed	Annuals	0
2007	1	2	Grazed	Annuals	0
2007	1	2	Grazed	Annuals	0
2007	1	2	Grazed	Annuals	0
2007	1	2	Grazed	Annuals	0
2007	1	2	Grazed	Annuals	19
2007	1	2	Grazed	Annuals	0
2007	1	2	Grazed	Annuals	1
2007	1	2	Grazed	Annuals	23
2007	1	3	Grazed	Annuals	4
2007	1	3	Grazed	Annuals	3
2007	1	3	Grazed	Annuals	3
2007	1	3	Grazed	Annuals	31
2007	1	3	Grazed	Annuals	0
2007	1	3	Grazed	Annuals	43
2007	1	3	Grazed	Annuals	0
2007	1	3	Grazed	Annuals	0
2007	1	3	Grazed	Annuals	2
2007	1	3	Grazed	Annuals	6
2007	2	4	Grazed	Annuals	19
2007	2	4	Grazed	Annuals	75
2007	2	4	Grazed	Annuals	48
2007	2	4	Grazed	Annuals	195
2007	2	4	Grazed	Annuals	3
2007	2	4	Grazed	Annuals	8
2007	2	4	Grazed	Annuals	12
2007	2	4	Grazed	Annuals	22
2007	2	4	Grazed	Annuals	26
2007	2	4	Grazed	Annuals	21
2007	2	5	Grazed	Annuals	10
2007	2	5	Grazed	Annuals	54
2007	2	5	Grazed	Annuals	36
2007	2	5	Grazed	Annuals	3
2007	2	5	Grazed	Annuals	20
2007	2	5	Grazed	Annuals	54
2007	2	5	Grazed	Annuals	25
2007	2	5	Grazed	Annuals	1
2007	2	5	Grazed	Annuals	4
2007	2	5	Grazed	Annuals	52
2007	2	6	Grazed	Annuals	75
2007	2	6	Grazed	Annuals	41
2007	2	6	Grazed	Annuals	86
2007	2	6	Grazed	Annuals	22
2007	2	6	Grazed	Annuals	6

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2007	2	6	Grazed	Annuals	36
2007	2	6	Grazed	Annuals	107
2007	2	6	Grazed	Annuals	12
2007	2	6	Grazed	Annuals	8
2007	2	6	Grazed	Annuals	35
2007	3	7	Control	Annuals	0
2007	3	7	Control	Annuals	7
2007	3	7	Control	Annuals	17
2007	3	7	Control	Annuals	121
2007	3	7	Control	Annuals	5
2007	3	7	Control	Annuals	16
2007	3	7	Control	Annuals	1
2007	3	7	Control	Annuals	112
2007	3	7	Control	Annuals	0
2007	3	7	Control	Annuals	9
2007	3	8	Control	Annuals	11
2007	3	8	Control	Annuals	0
2007	3	8	Control	Annuals	0
2007	3	8	Control	Annuals	0
2007	3	8	Control	Annuals	0
2007	3	8	Control	Annuals	4
2007	3	8	Control	Annuals	3
2007	3	8	Control	Annuals	0
2007	3	8	Control	Annuals	18
2007	3	8	Control	Annuals	7
2007	3	9	Control	Annuals	0
2007	3	9	Control	Annuals	33
2007	3	9	Control	Annuals	1
2007	3	9	Control	Annuals	4
2007	3	9	Control	Annuals	13
2007	3	9	Control	Annuals	18
2007	3	9	Control	Annuals	2
2007	3	9	Control	Annuals	6
2007	3	9	Control	Annuals	2
2007	3	9	Control	Annuals	57
2007	1	1	Grazed	SANDBERG	0
2007	1	1	Grazed	SANDBERG	0
2007	1	1	Grazed	SANDBERG	0
2007	1	1	Grazed	SANDBERG	58
2007	1	1	Grazed	SANDBERG	5
2007	1	1	Grazed	SANDBERG	0
2007	1	1	Grazed	SANDBERG	0
2007	1	1	Grazed	SANDBERG	0
2007	1	1	Grazed	SANDBERG	2

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2007	1	1	Grazed	SANDBERG	0
2007	1	2	Grazed	SANDBERG	0
2007	1	2	Grazed	SANDBERG	0
2007	1	2	Grazed	SANDBERG	0
2007	1	2	Grazed	SANDBERG	0
2007	1	2	Grazed	SANDBERG	0
2007	1	2	Grazed	SANDBERG	0
2007	1	2	Grazed	SANDBERG	0
2007	1	2	Grazed	SANDBERG	0
2007	1	2	Grazed	SANDBERG	0
2007	1	2	Grazed	SANDBERG	4
2007	1	3	Grazed	SANDBERG	0
2007	1	3	Grazed	SANDBERG	0
2007	1	3	Grazed	SANDBERG	0
2007	1	3	Grazed	SANDBERG	0
2007	1	3	Grazed	SANDBERG	0
2007	1	3	Grazed	SANDBERG	1
2007	1	3	Grazed	SANDBERG	0
2007	1	3	Grazed	SANDBERG	24
2007	1	3	Grazed	SANDBERG	0
2007	1	3	Grazed	SANDBERG	3
2007	2	4	Grazed	SANDBERG	0
2007	2	4	Grazed	SANDBERG	10
2007	2	4	Grazed	SANDBERG	35
2007	2	4	Grazed	SANDBERG	3
2007	2	4	Grazed	SANDBERG	0
2007	2	4	Grazed	SANDBERG	0
2007	2	4	Grazed	SANDBERG	26
2007	2	4	Grazed	SANDBERG	0
2007	2	4	Grazed	SANDBERG	13
2007	2	4	Grazed	SANDBERG	82
2007	2	5	Grazed	SANDBERG	74
2007	2	5	Grazed	SANDBERG	0
2007	2	5	Grazed	SANDBERG	0
2007	2	5	Grazed	SANDBERG	0
2007	2	5	Grazed	SANDBERG	7
2007	2	5	Grazed	SANDBERG	1
2007	2	5	Grazed	SANDBERG	0
2007	2	5	Grazed	SANDBERG	14
2007	2	5	Grazed	SANDBERG	20
2007	2	5	Grazed	SANDBERG	134
2007	2	6	Grazed	SANDBERG	5
2007	2	6	Grazed	SANDBERG	0
2007	2	6	Grazed	SANDBERG	0

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2007	2	6	Grazed	SANDBERG	3
2007	2	6	Grazed	SANDBERG	0
2007	2	6	Grazed	SANDBERG	1
2007	2	6	Grazed	SANDBERG	1
2007	2	6	Grazed	SANDBERG	1
2007	2	6	Grazed	SANDBERG	0
2007	2	6	Grazed	SANDBERG	13
2007	3	7	Control	SANDBERG	61
2007	3	7	Control	SANDBERG	73
2007	3	7	Control	SANDBERG	11
2007	3	7	Control	SANDBERG	67
2007	3	7	Control	SANDBERG	127
2007	3	7	Control	SANDBERG	33
2007	3	7	Control	SANDBERG	3
2007	3	7	Control	SANDBERG	5
2007	3	7	Control	SANDBERG	91
2007	3	7	Control	SANDBERG	1
2007	3	8	Control	SANDBERG	79
2007	3	8	Control	SANDBERG	22
2007	3	8	Control	SANDBERG	0
2007	3	8	Control	SANDBERG	27
2007	3	8	Control	SANDBERG	38
2007	3	8	Control	SANDBERG	4
2007	3	8	Control	SANDBERG	0
2007	3	8	Control	SANDBERG	4
2007	3	8	Control	SANDBERG	6
2007	3	8	Control	SANDBERG	4
2007	3	9	Control	SANDBERG	0
2007	3	9	Control	SANDBERG	1
2007	3	9	Control	SANDBERG	1
2007	3	9	Control	SANDBERG	85
2007	3	9	Control	SANDBERG	0
2007	3	9	Control	SANDBERG	1
2007	3	9	Control	SANDBERG	3
2007	3	9	Control	SANDBERG	0
2007	3	9	Control	SANDBERG	2
2007	3	9	Control	SANDBERG	9
2007	1	1	Grazed	CRESTED	0
2007	1	1	Grazed	CRESTED	0
2007	1	1	Grazed	CRESTED	0
2007	1	1	Grazed	CRESTED	0
2007	1	1	Grazed	CRESTED	0
2007	1	1	Grazed	CRESTED	0
2007	1	1	Grazed	CRESTED	0

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2007	1	1	Grazed	CRESTED	0
2007	1	1	Grazed	CRESTED	0
2007	1	1	Grazed	CRESTED	0
2007	1	2	Grazed	CRESTED	0
2007	1	2	Grazed	CRESTED	0
2007	1	2	Grazed	CRESTED	0
2007	1	2	Grazed	CRESTED	0
2007	1	2	Grazed	CRESTED	0
2007	1	2	Grazed	CRESTED	0
2007	1	2	Grazed	CRESTED	1
2007	1	2	Grazed	CRESTED	0
2007	1	2	Grazed	CRESTED	0
2007	1	2	Grazed	CRESTED	0
2007	1	3	Grazed	CRESTED	0
2007	1	3	Grazed	CRESTED	0
2007	1	3	Grazed	CRESTED	3
2007	1	3	Grazed	CRESTED	11
2007	1	3	Grazed	CRESTED	0
2007	1	3	Grazed	CRESTED	0
2007	1	3	Grazed	CRESTED	0
2007	1	3	Grazed	CRESTED	0
2007	1	3	Grazed	CRESTED	0
2007	1	3	Grazed	CRESTED	0
2007	2	4	Grazed	CRESTED	1
2007	2	4	Grazed	CRESTED	0
2007	2	4	Grazed	CRESTED	10
2007	2	4	Grazed	CRESTED	1
2007	2	4	Grazed	CRESTED	0
2007	2	4	Grazed	CRESTED	8
2007	2	4	Grazed	CRESTED	0
2007	2	4	Grazed	CRESTED	0
2007	2	4	Grazed	CRESTED	0
2007	2	4	Grazed	CRESTED	0
2007	2	5	Grazed	CRESTED	0
2007	2	5	Grazed	CRESTED	0
2007	2	5	Grazed	CRESTED	0
2007	2	5	Grazed	CRESTED	0
2007	2	5	Grazed	CRESTED	10
2007	2	5	Grazed	CRESTED	0
2007	2	5	Grazed	CRESTED	0
2007	2	5	Grazed	CRESTED	0
2007	2	5	Grazed	CRESTED	0
2007	2	5	Grazed	CRESTED	0
2007	2	6	Grazed	CRESTED	0

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2007	2	6	Grazed	CRESTED	0
2007	2	6	Grazed	CRESTED	0
2007	2	6	Grazed	CRESTED	0
2007	2	6	Grazed	CRESTED	0
2007	2	6	Grazed	CRESTED	0
2007	2	6	Grazed	CRESTED	0
2007	2	6	Grazed	CRESTED	0
2007	2	6	Grazed	CRESTED	0
2007	2	6	Grazed	CRESTED	3
2007	3	7	Control	CRESTED	0
2007	3	7	Control	CRESTED	10
2007	3	7	Control	CRESTED	11
2007	3	7	Control	CRESTED	0
2007	3	7	Control	CRESTED	0
2007	3	7	Control	CRESTED	0
2007	3	7	Control	CRESTED	0
2007	3	7	Control	CRESTED	2
2007	3	7	Control	CRESTED	0
2007	3	7	Control	CRESTED	0
2007	3	8	Control	CRESTED	0
2007	3	8	Control	CRESTED	0
2007	3	8	Control	CRESTED	0
2007	3	8	Control	CRESTED	0
2007	3	8	Control	CRESTED	0
2007	3	8	Control	CRESTED	0
2007	3	8	Control	CRESTED	0
2007	3	8	Control	CRESTED	0
2007	3	8	Control	CRESTED	0
2007	3	8	Control	CRESTED	0
2007	3	9	Control	CRESTED	0
2007	3	9	Control	CRESTED	0
2007	3	9	Control	CRESTED	0
2007	3	9	Control	CRESTED	1
2007	3	9	Control	CRESTED	0
2007	3	9	Control	CRESTED	0
2007	3	9	Control	CRESTED	0
2007	3	9	Control	CRESTED	0
2007	3	9	Control	CRESTED	0
2007	3	9	Control	CRESTED	0
2007	1	1	Grazed	Stipa	0
2007	1	1	Grazed	Stipa	0
2007	1	1	Grazed	Stipa	0
2007	1	1	Grazed	Stipa	0
2007	1	1	Grazed	Stipa	0

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2007	1	1	Grazed	Stipa	0
2007	1	1	Grazed	Stipa	0
2007	1	1	Grazed	Stipa	0
2007	1	1	Grazed	Stipa	0
2007	1	1	Grazed	Stipa	0
2007	1	2	Grazed	Stipa	0
2007	1	2	Grazed	Stipa	0
2007	1	2	Grazed	Stipa	0
2007	1	2	Grazed	Stipa	0
2007	1	2	Grazed	Stipa	0
2007	1	2	Grazed	Stipa	0
2007	1	2	Grazed	Stipa	0
2007	1	2	Grazed	Stipa	0
2007	1	2	Grazed	Stipa	0
2007	1	2	Grazed	Stipa	0
2007	1	2	Grazed	Stipa	0
2007	1	3	Grazed	Stipa	0
2007	1	3	Grazed	Stipa	0
2007	1	3	Grazed	Stipa	0
2007	1	3	Grazed	Stipa	0
2007	1	3	Grazed	Stipa	0
2007	1	3	Grazed	Stipa	0
2007	1	3	Grazed	Stipa	0
2007	1	3	Grazed	Stipa	0
2007	1	3	Grazed	Stipa	0
2007	1	3	Grazed	Stipa	0
2007	2	4	Grazed	Stipa	0
2007	2	4	Grazed	Stipa	0
2007	2	4	Grazed	Stipa	0
2007	2	4	Grazed	Stipa	0
2007	2	4	Grazed	Stipa	0
2007	2	4	Grazed	Stipa	0
2007	2	4	Grazed	Stipa	0
2007	2	4	Grazed	Stipa	0
2007	2	4	Grazed	Stipa	0
2007	2	5	Grazed	Stipa	0
2007	2	5	Grazed	Stipa	0
2007	2	5	Grazed	Stipa	0
2007	2	5	Grazed	Stipa	0
2007	2	5	Grazed	Stipa	0
2007	2	5	Grazed	Stipa	0
2007	2	5	Grazed	Stipa	0
2007	2	5	Grazed	Stipa	0

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2007	2	5	Grazed	Stipa	0
2007	2	6	Grazed	Stipa	0
2007	2	6	Grazed	Stipa	0
2007	2	6	Grazed	Stipa	0
2007	2	6	Grazed	Stipa	0
2007	2	6	Grazed	Stipa	0
2007	2	6	Grazed	Stipa	0
2007	2	6	Grazed	Stipa	0
2007	2	6	Grazed	Stipa	0
2007	2	6	Grazed	Stipa	0
2007	2	6	Grazed	Stipa	0
2007	3	7	Control	Stipa	12
2007	3	7	Control	Stipa	13
2007	3	7	Control	Stipa	0
2007	3	7	Control	Stipa	0
2007	3	7	Control	Stipa	0
2007	3	7	Control	Stipa	0
2007	3	7	Control	Stipa	0
2007	3	7	Control	Stipa	0
2007	3	7	Control	Stipa	0
2007	3	7	Control	Stipa	0
2007	3	8	Control	Stipa	0
2007	3	8	Control	Stipa	0
2007	3	8	Control	Stipa	0
2007	3	8	Control	Stipa	0
2007	3	8	Control	Stipa	0
2007	3	8	Control	Stipa	0
2007	3	8	Control	Stipa	0
2007	3	8	Control	Stipa	0
2007	3	8	Control	Stipa	0
2007	3	8	Control	Stipa	0
2007	3	9	Control	Stipa	0
2007	3	9	Control	Stipa	0
2007	3	9	Control	Stipa	0
2007	3	9	Control	Stipa	0
2007	3	9	Control	Stipa	0
2007	3	9	Control	Stipa	0
2007	3	9	Control	Stipa	0
2007	3	9	Control	Stipa	0
2007	3	9	Control	Stipa	0
2007	3	9	Control	Stipa	0
2008	1	1	Grazed	CHEAT GRASS	62
2008	1	1	Grazed	CHEAT GRASS	40

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2008	1	1	Grazed	CHEAT GRASS	44
2008	1	1	Grazed	CHEAT GRASS	4
2008	1	1	Grazed	CHEAT GRASS	6
2008	1	1	Grazed	CHEAT GRASS	3
2008	1	1	Grazed	CHEAT GRASS	35
2008	1	1	Grazed	CHEAT GRASS	6
2008	1	1	Grazed	CHEAT GRASS	11
2008	1	1	Grazed	CHEAT GRASS	17
2008	1	2	Grazed	CHEAT GRASS	41
2008	1	2	Grazed	CHEAT GRASS	35
2008	1	2	Grazed	CHEAT GRASS	21
2008	1	2	Grazed	CHEAT GRASS	9
2008	1	2	Grazed	CHEAT GRASS	52
2008	1	2	Grazed	CHEAT GRASS	97
2008	1	2	Grazed	CHEAT GRASS	1
2008	1	2	Grazed	CHEAT GRASS	58
2008	1	2	Grazed	CHEAT GRASS	3
2008	1	2	Grazed	CHEAT GRASS	8
2008	1	3	Grazed	CHEAT GRASS	9
2008	1	3	Grazed	CHEAT GRASS	8
2008	1	3	Grazed	CHEAT GRASS	25
2008	1	3	Grazed	CHEAT GRASS	97
2008	1	3	Grazed	CHEAT GRASS	3
2008	1	3	Grazed	CHEAT GRASS	8
2008	1	3	Grazed	CHEAT GRASS	36
2008	1	3	Grazed	CHEAT GRASS	6
2008	1	3	Grazed	CHEAT GRASS	39
2008	1	3	Grazed	CHEAT GRASS	2
2008	2	4	Grazed	CHEAT GRASS	3
2008	2	4	Grazed	CHEAT GRASS	5
2008	2	4	Grazed	CHEAT GRASS	13
2008	2	4	Grazed	CHEAT GRASS	0
2008	2	4	Grazed	CHEAT GRASS	13
2008	2	4	Grazed	CHEAT GRASS	0
2008	2	4	Grazed	CHEAT GRASS	16
2008	2	4	Grazed	CHEAT GRASS	12
2008	2	4	Grazed	CHEAT GRASS	11

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2008	2	4	Grazed	CHEAT GRASS	10
2008	2	5	Grazed	CHEAT GRASS	104
2008	2	5	Grazed	CHEAT GRASS	0
2008	2	5	Grazed	CHEAT GRASS	4
2008	2	5	Grazed	CHEAT GRASS	6
2008	2	5	Grazed	CHEAT GRASS	45
2008	2	5	Grazed	CHEAT GRASS	11
2008	2	5	Grazed	CHEAT GRASS	2
2008	2	5	Grazed	CHEAT GRASS	33
2008	2	5	Grazed	CHEAT GRASS	1
2008	2	5	Grazed	CHEAT GRASS	4
2008	2	6	Grazed	CHEAT GRASS	32
2008	2	6	Grazed	CHEAT GRASS	10
2008	2	6	Grazed	CHEAT GRASS	10
2008	2	6	Grazed	CHEAT GRASS	18
2008	2	6	Grazed	CHEAT GRASS	1
2008	2	6	Grazed	CHEAT GRASS	7
2008	2	6	Grazed	CHEAT GRASS	30
2008	2	6	Grazed	CHEAT GRASS	8
2008	2	6	Grazed	CHEAT GRASS	36
2008	2	6	Grazed	CHEAT GRASS	3
2008	3	7	Control	CHEAT GRASS	8
2008	3	7	Control	CHEAT GRASS	15
2008	3	7	Control	CHEAT GRASS	12
2008	3	7	Control	CHEAT GRASS	16
2008	3	7	Control	CHEAT GRASS	0
2008	3	7	Control	CHEAT GRASS	81
2008	3	7	Control	CHEAT GRASS	92
2008	3	7	Control	CHEAT GRASS	6
2008	3	7	Control	CHEAT GRASS	109
2008	3	7	Control	CHEAT GRASS	8
2008	3	8	Control	CHEAT GRASS	29
2008	3	8	Control	CHEAT GRASS	6
2008	3	8	Control	CHEAT GRASS	157
2008	3	8	Control	CHEAT GRASS	141
2008	3	8	Control	CHEAT GRASS	104
2008	3	8	Control	CHEAT GRASS	11

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2008	3	8	Control	CHEAT GRASS	32
2008	3	8	Control	CHEAT GRASS	30
2008	3	8	Control	CHEAT GRASS	11
2008	3	8	Control	CHEAT GRASS	13
2008	3	9	Control	CHEAT GRASS	106
2008	3	9	Control	CHEAT GRASS	16
2008	3	9	Control	CHEAT GRASS	6
2008	3	9	Control	CHEAT GRASS	32
2008	3	9	Control	CHEAT GRASS	1
2008	3	9	Control	CHEAT GRASS	12
2008	3	9	Control	CHEAT GRASS	32
2008	3	9	Control	CHEAT GRASS	14
2008	3	9	Control	CHEAT GRASS	2
2008	3	9	Control	CHEAT GRASS	23
2008	1	1	Grazed	Annual MUSTARD	12
2008	1	1	Grazed	Annual MUSTARD	0
2008	1	1	Grazed	Annual MUSTARD	5
2008	1	1	Grazed	Annual MUSTARD	2
2008	1	1	Grazed	Annual MUSTARD	0
2008	1	1	Grazed	Annual MUSTARD	1
2008	1	1	Grazed	Annual MUSTARD	36
2008	1	1	Grazed	Annual MUSTARD	4
2008	1	1	Grazed	Annual MUSTARD	2
2008	1	1	Grazed	Annual MUSTARD	0
2008	1	2	Grazed	Annual MUSTARD	0
2008	1	2	Grazed	Annual MUSTARD	1
2008	1	2	Grazed	Annual MUSTARD	1
2008	1	2	Grazed	Annual MUSTARD	14
2008	1	2	Grazed	Annual MUSTARD	0

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2008	1	2	Grazed	Annual MUSTARD	5
2008	1	2	Grazed	Annual MUSTARD	4
2008	1	2	Grazed	Annual MUSTARD	1
2008	1	2	Grazed	Annual MUSTARD	0
2008	1	2	Grazed	Annual MUSTARD	2
2008	1	3	Grazed	Annual MUSTARD	0
2008	1	3	Grazed	Annual MUSTARD	5
2008	1	3	Grazed	Annual MUSTARD	0
2008	1	3	Grazed	Annual MUSTARD	5
2008	1	3	Grazed	Annual MUSTARD	0
2008	1	3	Grazed	Annual MUSTARD	3
2008	1	3	Grazed	Annual MUSTARD	0
2008	1	3	Grazed	Annual MUSTARD	3
2008	1	3	Grazed	Annual MUSTARD	16
2008	1	3	Grazed	Annual MUSTARD	0
2008	2	4	Grazed	Annual MUSTARD	2
2008	2	4	Grazed	Annual MUSTARD	10
2008	2	4	Grazed	Annual MUSTARD	2
2008	2	4	Grazed	Annual MUSTARD	0
2008	2	4	Grazed	Annual MUSTARD	0
2008	2	4	Grazed	Annual MUSTARD	0
2008	2	4	Grazed	Annual MUSTARD	3
2008	2	4	Grazed	Annual MUSTARD	1
2008	2	4	Grazed	Annual MUSTARD	12

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2008	2	4	Grazed	Annual MUSTARD	12
2008	2	5	Grazed	Annual MUSTARD	0
2008	2	5	Grazed	Annual MUSTARD	1
2008	2	5	Grazed	Annual MUSTARD	0
2008	2	5	Grazed	Annual MUSTARD	0
2008	2	5	Grazed	Annual MUSTARD	41
2008	2	5	Grazed	Annual MUSTARD	5
2008	2	5	Grazed	Annual MUSTARD	1
2008	2	5	Grazed	Annual MUSTARD	0
2008	2	5	Grazed	Annual MUSTARD	50
2008	2	5	Grazed	Annual MUSTARD	0
2008	2	6	Grazed	Annual MUSTARD	15
2008	2	6	Grazed	Annual MUSTARD	0
2008	2	6	Grazed	Annual MUSTARD	2
2008	2	6	Grazed	Annual MUSTARD	1
2008	2	6	Grazed	Annual MUSTARD	0
2008	2	6	Grazed	Annual MUSTARD	0
2008	2	6	Grazed	Annual MUSTARD	0
2008	2	6	Grazed	Annual MUSTARD	3
2008	2	6	Grazed	Annual MUSTARD	1
2008	2	6	Grazed	Annual MUSTARD	11
2008	3	7	Control	Annual MUSTARD	3
2008	3	7	Control	Annual MUSTARD	2
2008	3	7	Control	Annual MUSTARD	2

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2008	3	7	Control	Annual MUSTARD	7
2008	3	7	Control	Annual MUSTARD	0
2008	3	7	Control	Annual MUSTARD	8
2008	3	7	Control	Annual MUSTARD	0
2008	3	7	Control	Annual MUSTARD	3
2008	3	7	Control	Annual MUSTARD	0
2008	3	7	Control	Annual MUSTARD	0
2008	3	8	Control	Annual MUSTARD	0
2008	3	8	Control	Annual MUSTARD	1
2008	3	8	Control	Annual MUSTARD	0
2008	3	8	Control	Annual MUSTARD	11
2008	3	8	Control	Annual MUSTARD	5
2008	3	8	Control	Annual MUSTARD	0
2008	3	8	Control	Annual MUSTARD	0
2008	3	8	Control	Annual MUSTARD	0
2008	3	8	Control	Annual MUSTARD	5
2008	3	8	Control	Annual MUSTARD	0
2008	3	9	Control	Annual MUSTARD	2
2008	3	9	Control	Annual MUSTARD	0
2008	3	9	Control	Annual MUSTARD	5
2008	3	9	Control	Annual MUSTARD	0
2008	3	9	Control	Annual MUSTARD	7
2008	3	9	Control	Annual MUSTARD	1
2008	3	9	Control	Annual MUSTARD	0

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2008	3	9	Control	Annual MUSTARD	3
2008	3	9	Control	Annual MUSTARD	7
2008	3	9	Control	Annual MUSTARD	8
2008	1	1	Grazed	Annuals	0
2008	1	1	Grazed	Annuals	0
2008	1	1	Grazed	Annuals	3
2008	1	1	Grazed	Annuals	0
2008	1	1	Grazed	Annuals	0
2008	1	1	Grazed	Annuals	0
2008	1	1	Grazed	Annuals	0
2008	1	1	Grazed	Annuals	0
2008	1	1	Grazed	Annuals	4
2008	1	1	Grazed	Annuals	0
2008	1	2	Grazed	Annuals	0
2008	1	2	Grazed	Annuals	13
2008	1	2	Grazed	Annuals	0
2008	1	2	Grazed	Annuals	10
2008	1	2	Grazed	Annuals	0
2008	1	2	Grazed	Annuals	0
2008	1	2	Grazed	Annuals	0
2008	1	2	Grazed	Annuals	4
2008	1	2	Grazed	Annuals	0
2008	1	2	Grazed	Annuals	0
2008	1	3	Grazed	Annuals	0
2008	1	3	Grazed	Annuals	5
2008	1	3	Grazed	Annuals	0
2008	1	3	Grazed	Annuals	3
2008	1	3	Grazed	Annuals	2
2008	1	3	Grazed	Annuals	0
2008	1	3	Grazed	Annuals	1
2008	1	3	Grazed	Annuals	0
2008	1	3	Grazed	Annuals	0
2008	1	3	Grazed	Annuals	3
2008	2	4	Grazed	Annuals	7
2008	2	4	Grazed	Annuals	8
2008	2	4	Grazed	Annuals	64

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2008	2	4	Grazed	Annuals	0
2008	2	4	Grazed	Annuals	1
2008	2	4	Grazed	Annuals	0
2008	2	4	Grazed	Annuals	42
2008	2	4	Grazed	Annuals	16
2008	2	4	Grazed	Annuals	17
2008	2	4	Grazed	Annuals	34
2008	2	5	Grazed	Annuals	0
2008	2	5	Grazed	Annuals	4
2008	2	5	Grazed	Annuals	0
2008	2	5	Grazed	Annuals	9
2008	2	5	Grazed	Annuals	0
2008	2	5	Grazed	Annuals	9
2008	2	5	Grazed	Annuals	0
2008	2	5	Grazed	Annuals	20
2008	2	5	Grazed	Annuals	7
2008	2	5	Grazed	Annuals	5
2008	2	6	Grazed	Annuals	20
2008	2	6	Grazed	Annuals	9
2008	2	6	Grazed	Annuals	61
2008	2	6	Grazed	Annuals	67
2008	2	6	Grazed	Annuals	8
2008	2	6	Grazed	Annuals	0
2008	2	6	Grazed	Annuals	27
2008	2	6	Grazed	Annuals	32
2008	2	6	Grazed	Annuals	17
2008	2	6	Grazed	Annuals	36
2008	3	7	Control	Annuals	0
2008	3	7	Control	Annuals	0
2008	3	7	Control	Annuals	2
2008	3	7	Control	Annuals	0
2008	3	7	Control	Annuals	3
2008	3	7	Control	Annuals	3
2008	3	7	Control	Annuals	10
2008	3	7	Control	Annuals	9
2008	3	7	Control	Annuals	0
2008	3	7	Control	Annuals	0

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2008	3	8	Control	Annuals	0
2008	3	8	Control	Annuals	1
2008	3	8	Control	Annuals	76
2008	3	8	Control	Annuals	9
2008	3	8	Control	Annuals	2
2008	3	8	Control	Annuals	0
2008	3	8	Control	Annuals	7
2008	3	8	Control	Annuals	3
2008	3	8	Control	Annuals	0
2008	3	8	Control	Annuals	0
2008	3	9	Control	Annuals	0
2008	3	9	Control	Annuals	0
2008	3	9	Control	Annuals	2
2008	3	9	Control	Annuals	4
2008	3	9	Control	Annuals	10
2008	3	9	Control	Annuals	7
2008	3	9	Control	Annuals	0
2008	3	9	Control	Annuals	0
2008	3	9	Control	Annuals	0
2008	3	9	Control	Annuals	3
2008	1	1	Grazed	SANDBERG	0
2008	1	1	Grazed	SANDBERG	1
2008	1	1	Grazed	SANDBERG	0
2008	1	1	Grazed	SANDBERG	10
2008	1	1	Grazed	SANDBERG	5
2008	1	1	Grazed	SANDBERG	3
2008	1	1	Grazed	SANDBERG	2
2008	1	1	Grazed	SANDBERG	0
2008	1	1	Grazed	SANDBERG	97
2008	1	1	Grazed	SANDBERG	0
2008	1	2	Grazed	SANDBERG	0
2008	1	2	Grazed	SANDBERG	0
2008	1	2	Grazed	SANDBERG	0
2008	1	2	Grazed	SANDBERG	0
2008	1	2	Grazed	SANDBERG	0
2008	1	2	Grazed	SANDBERG	0
2008	1	2	Grazed	SANDBERG	13

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2008	1	2	Grazed	SANDBERG	0
2008	1	2	Grazed	SANDBERG	10
2008	1	2	Grazed	SANDBERG	15
2008	1	3	Grazed	SANDBERG	0
2008	1	3	Grazed	SANDBERG	11
2008	1	3	Grazed	SANDBERG	0
2008	1	3	Grazed	SANDBERG	6
2008	1	3	Grazed	SANDBERG	0
2008	1	3	Grazed	SANDBERG	0
2008	1	3	Grazed	SANDBERG	0
2008	1	3	Grazed	SANDBERG	2
2008	1	3	Grazed	SANDBERG	13
2008	1	3	Grazed	SANDBERG	0
2008	2	4	Grazed	SANDBERG	13
2008	2	4	Grazed	SANDBERG	0
2008	2	4	Grazed	SANDBERG	2
2008	2	4	Grazed	SANDBERG	37
2008	2	4	Grazed	SANDBERG	2
2008	2	4	Grazed	SANDBERG	0
2008	2	4	Grazed	SANDBERG	0
2008	2	4	Grazed	SANDBERG	11
2008	2	4	Grazed	SANDBERG	2
2008	2	4	Grazed	SANDBERG	0
2008	2	5	Grazed	SANDBERG	0
2008	2	5	Grazed	SANDBERG	0
2008	2	5	Grazed	SANDBERG	3
2008	2	5	Grazed	SANDBERG	1
2008	2	5	Grazed	SANDBERG	103
2008	2	5	Grazed	SANDBERG	43
2008	2	5	Grazed	SANDBERG	0
2008	2	5	Grazed	SANDBERG	0
2008	2	5	Grazed	SANDBERG	0
2008	2	5	Grazed	SANDBERG	0
2008	2	6	Grazed	SANDBERG	0
2008	2	6	Grazed	SANDBERG	0
2008	2	6	Grazed	SANDBERG	0
2008	2	6	Grazed	SANDBERG	0

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2008	2	6	Grazed	SANDBERG	3
2008	2	6	Grazed	SANDBERG	3
2008	2	6	Grazed	SANDBERG	2
2008	2	6	Grazed	SANDBERG	0
2008	2	6	Grazed	SANDBERG	0
2008	2	6	Grazed	SANDBERG	0
2008	3	7	Control	SANDBERG	5
2008	3	7	Control	SANDBERG	0
2008	3	7	Control	SANDBERG	30
2008	3	7	Control	SANDBERG	1
2008	3	7	Control	SANDBERG	22
2008	3	7	Control	SANDBERG	52
2008	3	7	Control	SANDBERG	19
2008	3	7	Control	SANDBERG	12
2008	3	7	Control	SANDBERG	0
2008	3	7	Control	SANDBERG	1
2008	3	8	Control	SANDBERG	0
2008	3	8	Control	SANDBERG	89
2008	3	8	Control	SANDBERG	0
2008	3	8	Control	SANDBERG	4
2008	3	8	Control	SANDBERG	0
2008	3	8	Control	SANDBERG	11
2008	3	8	Control	SANDBERG	52
2008	3	8	Control	SANDBERG	3
2008	3	8	Control	SANDBERG	12
2008	3	8	Control	SANDBERG	188
2008	3	9	Control	SANDBERG	0
2008	3	9	Control	SANDBERG	1
2008	3	9	Control	SANDBERG	20
2008	3	9	Control	SANDBERG	11
2008	3	9	Control	SANDBERG	0
2008	3	9	Control	SANDBERG	12
2008	3	9	Control	SANDBERG	1
2008	3	9	Control	SANDBERG	16
2008	3	9	Control	SANDBERG	0
2008	3	9	Control	SANDBERG	44
2008	1	1	Grazed	CRESTED	0

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2008	1	1	Grazed	CRESTED	1
2008	1	1	Grazed	CRESTED	0
2008	1	1	Grazed	CRESTED	1
2008	1	1	Grazed	CRESTED	9
2008	1	1	Grazed	CRESTED	2
2008	1	1	Grazed	CRESTED	3
2008	1	1	Grazed	CRESTED	8
2008	1	1	Grazed	CRESTED	10
2008	1	1	Grazed	CRESTED	0
2008	1	2	Grazed	CRESTED	0
2008	1	2	Grazed	CRESTED	0
2008	1	2	Grazed	CRESTED	0
2008	1	2	Grazed	CRESTED	0
2008	1	2	Grazed	CRESTED	5
2008	1	2	Grazed	CRESTED	11
2008	1	2	Grazed	CRESTED	0
2008	1	2	Grazed	CRESTED	8
2008	1	2	Grazed	CRESTED	4
2008	1	2	Grazed	CRESTED	1
2008	1	3	Grazed	CRESTED	4
2008	1	3	Grazed	CRESTED	0
2008	1	3	Grazed	CRESTED	25
2008	1	3	Grazed	CRESTED	0
2008	1	3	Grazed	CRESTED	0
2008	1	3	Grazed	CRESTED	0
2008	1	3	Grazed	CRESTED	0
2008	1	3	Grazed	CRESTED	0
2008	1	3	Grazed	CRESTED	0
2008	1	3	Grazed	CRESTED	0
2008	2	4	Grazed	CRESTED	0
2008	2	4	Grazed	CRESTED	0
2008	2	4	Grazed	CRESTED	0
2008	2	4	Grazed	CRESTED	0
2008	2	4	Grazed	CRESTED	0
2008	2	4	Grazed	CRESTED	2
2008	2	4	Grazed	CRESTED	0
2008	2	4	Grazed	CRESTED	1

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2008	2	4	Grazed	CRESTED	2
2008	2	4	Grazed	CRESTED	0
2008	2	5	Grazed	CRESTED	0
2008	2	5	Grazed	CRESTED	0
2008	2	5	Grazed	CRESTED	2
2008	2	5	Grazed	CRESTED	0
2008	2	5	Grazed	CRESTED	0
2008	2	5	Grazed	CRESTED	0
2008	2	5	Grazed	CRESTED	0
2008	2	5	Grazed	CRESTED	0
2008	2	5	Grazed	CRESTED	0
2008	2	6	Grazed	CRESTED	0
2008	2	6	Grazed	CRESTED	0
2008	2	6	Grazed	CRESTED	0
2008	2	6	Grazed	CRESTED	0
2008	2	6	Grazed	CRESTED	1
2008	2	6	Grazed	CRESTED	1
2008	2	6	Grazed	CRESTED	3
2008	2	6	Grazed	CRESTED	0
2008	2	6	Grazed	CRESTED	0
2008	2	6	Grazed	CRESTED	0
2008	3	7	Control	CRESTED	0
2008	3	7	Control	CRESTED	0
2008	3	7	Control	CRESTED	3
2008	3	7	Control	CRESTED	1
2008	3	7	Control	CRESTED	0
2008	3	7	Control	CRESTED	0
2008	3	7	Control	CRESTED	0
2008	3	7	Control	CRESTED	0
2008	3	7	Control	CRESTED	7
2008	3	7	Control	CRESTED	0
2008	3	8	Control	CRESTED	1
2008	3	8	Control	CRESTED	0
2008	3	8	Control	CRESTED	0
2008	3	8	Control	CRESTED	0
2008	3	8	Control	CRESTED	0

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2008	3	8	Control	CRESTED	9
2008	3	8	Control	CRESTED	0
2008	3	8	Control	CRESTED	0
2008	3	8	Control	CRESTED	0
2008	3	8	Control	CRESTED	0
2008	3	9	Control	CRESTED	0
2008	3	9	Control	CRESTED	0
2008	3	9	Control	CRESTED	0
2008	3	9	Control	CRESTED	0
2008	3	9	Control	CRESTED	2
2008	3	9	Control	CRESTED	4
2008	3	9	Control	CRESTED	0
2008	3	9	Control	CRESTED	0
2008	3	9	Control	CRESTED	0
2008	3	9	Control	CRESTED	1
2008	1	1	Grazed	Stipa	2
2008	1	1	Grazed	Stipa	0
2008	1	1	Grazed	Stipa	0
2008	1	1	Grazed	Stipa	0
2008	1	1	Grazed	Stipa	0
2008	1	1	Grazed	Stipa	0
2008	1	1	Grazed	Stipa	0
2008	1	1	Grazed	Stipa	0
2008	1	1	Grazed	Stipa	0
2008	1	1	Grazed	Stipa	0
2008	1	1	Grazed	Stipa	0
2008	1	2	Grazed	Stipa	0
2008	1	2	Grazed	Stipa	0
2008	1	2	Grazed	Stipa	0
2008	1	2	Grazed	Stipa	0
2008	1	2	Grazed	Stipa	0
2008	1	2	Grazed	Stipa	0
2008	1	2	Grazed	Stipa	0
2008	1	2	Grazed	Stipa	0
2008	1	2	Grazed	Stipa	0
2008	1	2	Grazed	Stipa	0
2008	1	3	Grazed	Stipa	0
2008	1	3	Grazed	Stipa	0

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2008	1	3	Grazed	Stipa	7
2008	1	3	Grazed	Stipa	0
2008	1	3	Grazed	Stipa	0
2008	1	3	Grazed	Stipa	0
2008	1	3	Grazed	Stipa	0
2008	1	3	Grazed	Stipa	3
2008	1	3	Grazed	Stipa	0
2008	1	3	Grazed	Stipa	0
2008	2	4	Grazed	Stipa	0
2008	2	4	Grazed	Stipa	0
2008	2	4	Grazed	Stipa	0
2008	2	4	Grazed	Stipa	0
2008	2	4	Grazed	Stipa	0
2008	2	4	Grazed	Stipa	0
2008	2	4	Grazed	Stipa	0
2008	2	4	Grazed	Stipa	1
2008	2	4	Grazed	Stipa	0
2008	2	4	Grazed	Stipa	2
2008	2	5	Grazed	Stipa	1
2008	2	5	Grazed	Stipa	0
2008	2	5	Grazed	Stipa	0
2008	2	5	Grazed	Stipa	0
2008	2	5	Grazed	Stipa	0
2008	2	5	Grazed	Stipa	2
2008	2	5	Grazed	Stipa	0
2008	2	5	Grazed	Stipa	0
2008	2	5	Grazed	Stipa	0
2008	2	5	Grazed	Stipa	0
2008	2	6	Grazed	Stipa	0
2008	2	6	Grazed	Stipa	0
2008	2	6	Grazed	Stipa	0
2008	2	6	Grazed	Stipa	0
2008	2	6	Grazed	Stipa	0
2008	2	6	Grazed	Stipa	0
2008	2	6	Grazed	Stipa	0
2008	2	6	Grazed	Stipa	4

YEAR	BLOCK	TRANSECT	Treatment	SPECIES	DENSITY
2008	2	6	Grazed	Stipa	0
2008	3	7	Control	Stipa	0
2008	3	7	Control	Stipa	0
2008	3	7	Control	Stipa	0
2008	3	7	Control	Stipa	0
2008	3	7	Control	Stipa	0
2008	3	7	Control	Stipa	0
2008	3	7	Control	Stipa	0
2008	3	7	Control	Stipa	0
2008	3	7	Control	Stipa	0
2008	3	7	Control	Stipa	0
2008	3	8	Control	Stipa	0
2008	3	8	Control	Stipa	0
2008	3	8	Control	Stipa	0
2008	3	8	Control	Stipa	0
2008	3	8	Control	Stipa	0
2008	3	8	Control	Stipa	0
2008	3	8	Control	Stipa	0
2008	3	8	Control	Stipa	0
2008	3	8	Control	Stipa	0
2008	3	8	Control	Stipa	0
2008	3	9	Control	Stipa	0
2008	3	9	Control	Stipa	0
2008	3	9	Control	Stipa	0
2008	3	9	Control	Stipa	0
2008	3	9	Control	Stipa	0
2008	3	9	Control	Stipa	0
2008	3	9	Control	Stipa	0
2008	3	9	Control	Stipa	0
2008	3	9	Control	Stipa	0

Cow Number	Year	Treatment	Cow Weight	BCCS
247	2007	Pregraze	1180	5
977	2007	Pregraze	1295	6
51	2007	Pregraze	1515	6
113	2007	Pregraze	1210	5
913	2007	Pregraze	1175	5
431	2007	Pregraze	991	5
904	2007	Pregraze	1170	5
203	2007	Pregraze	1190	5.75
44	2007	Pregraze	1045	4.75
442	2007	Pregraze	1015	5.5
144	2007	Pregraze	1270	5
207	2007	Pregraze	1110	5
46	2007	Pregraze	1205	5.75
841	2007	Pregraze	1295	6
306	2007	Pregraze	1100	6
302	2007	Pregraze	1130	6
245	2007	Pregraze	1225	5.75
406	2007	Pregraze	1050	5.5
35	2007	Pregraze	1245	5
17	2007	Pregraze	1040	5.5
928	2007	Pregraze	1275	6
265	2007	Pregraze	1245	5.75
942	2007	Pregraze	1180	5.5
313	2007	Pregraze	1180	5.5
48	2007	Pregraze	1215	5.5
47	2007	Pregraze	1205	6
223	2007	Pregraze	1125	5.25
920	2007	Pregraze	1350	6.25
125	2007	Pregraze	1045	4.75
109	2007	Pregraze	1160	5.5
345	2007	Pregraze	1095	5
322	2007	Pregraze	1045	6
440	2007	Pregraze	1085	5
112	2007	Pregraze	1150	5.5
911	2007	Pregraze	1185	5
938	2007	Pregraze	1305	5.5
624	2007	Pregraze	1290	6.25
845	2007	Pregraze	1230	5.75
413	2007	Pregraze	1125	6.25
209	2007	Pregraze	1220	6.25
948	2007	Pregraze	1145	5.25
247	2007	Post Graze	1235	5.5

Cow Number	Year	Treatment	Cow Weight	BCCS
977	2007	Post Graze	1355	6.25
51	2007	Post Graze	1550	6
113	2007	Post Graze	1260	6
913	2007	Post Graze	1200	5.5
431	2007	Post Graze	980	5.25
904	2007	Post Graze	1220	5.5
203	2007	Post Graze	1245	5.5
44	2007	Post Graze	1110	5
442	2007	Post Graze	1025	5.5
144	2007	Post Graze	1305	6
207	2007	Post Graze	1210	6
46	2007	Post Graze	1325	6
841	2007	Post Graze	1375	6.5
306	2007	Post Graze	1130	6
302	2007	Post Graze	1190	6.25
245	2007	Post Graze	1275	6
406	2007	Post Graze	1075	5
35	2007	Post Graze	1245	6
17	2007	Post Graze	1040	5
928	2007	Post Graze	1280	6.2
265	2007	Post Graze	1255	6
942	2007	Post Graze	1210	5.5
313	2007	Post Graze	1165	5.5
48	2007	Post Graze	1295	6.25
47	2007	Post Graze	1250	6.25
223	2007	Post Graze	1190	5.5
920	2007	Post Graze	1385	6.25
125	2007	Post Graze	1145	5.5
109	2007	Post Graze	1185	5.5
345	2007	Post Graze	1135	5.5
322	2007	Post Graze	1180	6
440	2007	Post Graze	1080	5
112	2007	Post Graze	1215	6
911	2007	Post Graze	1205	5
938	2007	Post Graze	1300	5.5
624	2007	Post Graze	1350	6
845	2007	Post Graze	1300	6
413	2007	Post Graze	1145	6.25
209	2007	Post Graze	1270	6.5
948	2007	Post Graze	1185	5.5
210	2008	Pregraze	1205	5
301	2008	Pregraze	1175	5

Cow Number	Year		Treatment	Cow Weight	BCCS
323		2008	Pregraze	1220	5
234		2008	Pregraze	1375	5.25
412		2008	Pregraze	1390	5.25
303		2008	Pregraze	1250	6
235		2008	Pregraze	1350	6
221		2008	Pregraze	1265	5.25
201		2008	Pregraze	1300	5.5
145		2008	Pregraze	1225	5.25
528		2008	Pregraze	1110	5.25
310		2008	Pregraze	1165	5.75
302		2008	Pregraze	1135	5.5
230		2008	Pregraze	1290	6
242		2008	Pregraze	1335	6
126		2008	Pregraze	1185	5.5
27		2008	Pregraze	1085	5
442		2008	Pregraze	1085	5.5
1		2008	Pregraze	1320	6
42		2008	Pregraze	1295	5.25
223		2008	Pregraze	1155	6
39		2008	Pregraze	1330	5.5
509		2008	Pregraze	1070	5.5
321		2008	Pregraze	1215	6
504		2008	Pregraze	1095	5.75
13		2008	Pregraze	1170	6
304		2008	Pregraze	1220	6
406		2008	Pregraze	1240	6
8		2008	Pregraze	1125	6
17		2008	Pregraze	1010	5.5
526		2008	Pregraze	1050	5.25
518		2008	Pregraze	865	4.75
305		2008	Pregraze	1195	5.5
941		2008	Pregraze	1475	5.25
909		2008	Pregraze	1220	5.5
138		2008	Pregraze	1365	6
511		2008	Pregraze	1125	5.5
180		2008	Pregraze	1260	6
329		2008	Pregraze	1170	6
427		2008	Pregraze	1045	5.5
328		2008	Pregraze	1275	5
309		2008	Pregraze	1350	5.75
7		2008	Pregraze	1285	5.5
551		2008	Pregraze	1150	6

Cow Number	Year		Treatment	Cow Weight	BCCS
317		2008	Pregraze	1340	5.5
527		2008	Pregraze	1000	6
541		2008	Pregraze	1120	5.75
239		2008	Pregraze	1180	5
425		2008	Pregraze	1160	5.25
502		2008	Pregraze	1030	6
548		2008	Pregraze	1100	5.75
501		2008	Pregraze	1030	5.5
338		2008	Pregraze	1000	5.5
4		2008	Pregraze	1195	5.25
426		2008	Pregraze	1225	5.5
217		2008	Pregraze	1360	5.5
44		2008	Pregraze	1030	5.5
210		2008	Post Graze	1230	5.75
301		2008	Post Graze	1260	5.75
323		2008	Post Graze	1220	5.5
234		2008	Post Graze	1355	6
412		2008	Post Graze	1430	6.5
303		2008	Post Graze	1280	7
235		2008	Post Graze	1350	7
221		2008	Post Graze	1270	6.25
201		2008	Post Graze	1380	6.5
145		2008	Post Graze	1325	5.75
528		2008	Post Graze	1125	6
310		2008	Post Graze	1250	6.5
302		2008	Post Graze	1205	6
230		2008	Post Graze	1300	6.5
242		2008	Post Graze	1395	6.5
126		2008	Post Graze	1240	6
27		2008	Post Graze	1150	6.5
442		2008	Post Graze	1130	6
1		2008	Post Graze	1395	7
42		2008	Post Graze	1300	6.5
223		2008	Post Graze	1170	6.5
39		2008	Post Graze	1360	6
509		2008	Post Graze	1140	6.25
321		2008	Post Graze	1270	6.5
504		2008	Post Graze	1115	6
13		2008	Post Graze	1155	7
304		2008	Post Graze	1260	6.5
406		2008	Post Graze	1235	6.5
8		2008	Post Graze	1175	6.5

Cow Number	Year		Treatment	Cow Weight	BCCS
17		2008	Post Graze	1010	5.5
526		2008	Post Graze	1050	5.5
518		2008	Post Graze	956	6
305		2008	Post Graze	1200	6.5
941		2008	Post Graze	1460	6.25
909		2008	Post Graze	1210	5.75
138		2008	Post Graze	1465	6.5
511		2008	Post Graze	1160	6.25
180		2008	Post Graze	1310	6.5
329		2008	Post Graze	1235	7
427		2008	Post Graze	1055	6
328		2008	Post Graze	1300	6
309		2008	Post Graze	1315	6.5
7		2008	Post Graze	1325	6.25
551		2008	Post Graze	1255	6
317		2008	Post Graze	1355	6.5
527		2008	Post Graze	1060	6.75
541		2008	Post Graze	1230	6.5
239		2008	Post Graze	1185	6
425		2008	Post Graze	1250	6.25
502		2008	Post Graze	1105	6
548		2008	Post Graze	1175	6.5
501		2008	Post Graze	1100	6
338		2008	Post Graze	1070	6.5
4		2008	Post Graze	1265	6.25
426		2008	Post Graze	1295	6.75
217		2008	Post Graze	1465	6.5
44		2008	Post Graze	1110	5.75