Evaluating Habitat Aeration Treatments in Wyoming's Northern Johnson County (Northern Rolling High Plains)

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by

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Abstract: *Greater sage-grouse (Centrocercus urophasianus) have become a species of concern, due to a wide-range population decline. Local working groups along with state and federal conservation and wildlife organizations have implemented management practices to improve sage-grouse habitat and ultimately protect populations from further decline.*

A pasture aerator has been used to enhance sage-grouse habitat in several western states, including Northern Johnson County of Wyoming (Lake DeSmet Conservation District). Aeration and broadcast seeding treatments were conducted to improve rangeland condition and promote forb growth (Lake DeSmet Sage-Grouse Habitat Management Project). The Wyoming Game and Fish Department (WGFD) and the Natural Resources Conservation Service (NRCS) evaluated these to determine plant community changes.

These treatments resulted in many changes in the plant communities. The majority of sites showed a decrease in low seral species that reduce rangeland health such as blue grama (Bouteloua gracilis) and threadleaf sedge (Carex filifolia). An increase in western wheatgrass (Pascopyrum smithii) was observed on all sites. Valuable forbs such as American vetch (Vicia Americana) and shrubs such as winterfat (Krascheninnikovia lanata) increased in treated sites with and without seeding. Wyoming big sagebrush (Artemisia tridentata ssp. wyomingensis) was crushed, stimulating growth of surviving branches within the treatment sites. A reduction in the canopy closure of approximately fifty percent resulted when Wyoming big sagebrush was treated, yet little sagebrush mortality was observed. The treatments resulted in a dramatic increase in annual bromes, especially Japanese brome (Bromus japonicus). Falcata alfalfa (Medicago sativa spp. falcate) was also broadcasted in all treatment sites. Falcata was used because of its ability to fix nitrogen and add diversity to the landscape. Little success has been observed with the dry land alfalfa species.

Introduction

In northeastern Wyoming, big sagebrush (*Artemisia tridentata ssp. wyomingensis*) is a requirement for greater sage-grouse (*Centrocercus urophasianus*) survival, however during the first stage of their lives they rely on forbs and insects to provide the energy needed to grow and develop. Aeration treatments should favor grass and forb production while reducing big sagebrush canopy cover. This treatment does not remove sagebrush from the system like fire or chemical treatments.

Aeration treatments were chosen to rejuvenate rangeland while still maintaining the Wyoming big sagebrush component. Forbs such as falcata alfalfa (*Medicago sativa* spp. falcate), yellow prairie coneflower Stillwater cultivar (*Ratibida columnifera)*, and American vetch (*Vicia Americana*) were broadcast seeded. Rangeland treatments began in 2005 to enhance sage-grouse habitat, while landowners provided the needed grazing rest on these vital sage-grouse habitat

areas. During the summer of 2007, one, two and three year-old treatments were evaluated to determine the effects on plant diversity and composition.

Much of the aeration and broadcast seeding practices were implemented during drought years, which may have impacted seed germination. The second year of aerating (2006) was one of the driest years on record for northeastern Wyoming, with extremely poor plant production. Compared to previous years, 2007 had a wet spring that allowed for good production on most forb and grass species.

Study Area

The study was conducted on private lands in the Powder River Basin (PRB) of northern Johnson County. It is classified as a 10-14" precipitation zone, although wide fluctuations occur in precipitation resulting in more drought years than above normal precipitation years. Soils are dominated by clay and clay-loams. In many cases, areas with greater than 75% ground cover have the most potential for high infiltration and lower runoff. An exception would be where short-grasses form a strong sod and dominate the site. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Part 630, NRCS National Engineering Handbook for detailed hydrology information). Elevation ranges from 3800 feet to 5100 feet. The major drainage system is the Powder River.

Northeastern Wyoming is a mixed grass/sagebrush habitat. Much of this area has shifted to a steady state of threadleaf sedge (*Carex filifolia*), blue grama (*Bouteloua gracilis*), and prickly pear (*Opuntia polyacantha*) communities due to a combination of shrub removal, overgrazing, farming and drought. Without land management changes or some disturbance, the community will remain at this steady state.

Methods

To monitor the affects of the treatment, we sampled random locations both inside the treatment and an adjacent untreated area (control). Sampling methods were based on the US Forest Service ECODATA sampling method, but were modified to fit our sampling needs.

Transects located within the treatment sites were chosen first. From the starting point a 100-foot tape was stretched through the determined site. Control transects were then located on a similar heading on the same ecological site adjacent to the treatment area. Rooted frequency, percent canopy, and ground cover were evaluated at every 10-foot mark.

Canopy cover estimates were based on techniques developed by Daubenmire (1959). Canopy coverage was recorded to the nearest percent in the microplot. Microplots were a 20-inch square quadrant frame. Line intercept techniques were used on one site to determine the shrub canopy closure within and outside the treatment areas.

Nested-rooted frequency was estimated in each microplot. The 20-inch frame was sectioned into four quadrants. The smallest quadrant a plant was rooted in was identified and recorded. The sections used in this study were; 2 x 2 inch (1 percent of total area), 10 x 10 inch (25 percent of total area), 10 x 20 inch (50 percent of total area), 20 x 20 (100 percent of total area).

Ground (basal) coverage was estimated by point sampling at designated marks on the microplot frame. Fifteen points were sampled at each microplot location. The point was classified as; bare soil, gravel/rock, moss, litter, basal vegetation, or wood.

Results

Evaluations of aeration/broadcast seeding treatments were done on all sites that had more than one growing season after the treatment. Six of the aeration sites met the criteria. Four of the sites were in a mixed grass sagebrush community with one being an overflow site. Another site was a threadleaf sedge, blue grama and prickly pear dominated site. The sixth site was considered go-back land.

Go-back land was once used as farmland and then allowed to re-establish with native species. This land was most likely planted to crested wheatgrass (*Agropyron cristatum*) during the 1930s. Eventually the land was allowed to reestablish with native and non-native plant species. Figure 5 shows the results of the aeration/broadcast seeding done in this community type. Annual bromes are filling in the voids left by other species.

The following graphs (Figures 1-6) show the differences between plant communities on the treated and untreated sites. The y-axis of each graph contains the importance value. The importance value for each species found in the plot was derived using the following formula: ((relative percent canopy + relative rooted frequency)/2)*100.

Line intercept data from one site, located in a mixed grass/sagebrush community, shows approximately a fifty percent reduction in sagebrush canopy closure, yet overall canopy cover was increased with graminoid species. Graminoid is defined as grasses and grasslike plants. The area had 19.5% canopy cover in untreated habitat and 9.67% in treated habitat. Other sites show a reduction in the importance value of Wyoming big sagebrush, but the critical shrub is still in the system. (See Figures 2, 3, and 4) Although the reduction in Wyoming big sage canopy is clearly displayed, the treatment stimulated new plant growth, rarely resulting in shrub mortality.

Many areas in the PRB have suffered from ten years of drought, which have affected land management decisions and consequently shifted plant community types. Species that reduce rangeland production such as blue grama and threadleaf sedge are now quite prevalent in the Northern Rolling High Plains Major Land Resource Area of the PRB. Blue grama forms a sod that unless disturbed, will only produce approximately 20% of the soils' potential forage for grazers and wildlife cover. The greatest success of treatments was seen in the steady state rangelands of blue grama/prickly pear communities (see Figure 1). On this site blue grama substantially decreased, providing an opportunity for western wheatgrass to expand.

Ground cover data from the sites show an increase in litter when the treatment area is in a mixed grass/sagebrush community. When treatments occur in graminoid-dominated sites there is an increase in bare ground from divots produced by the aerator.

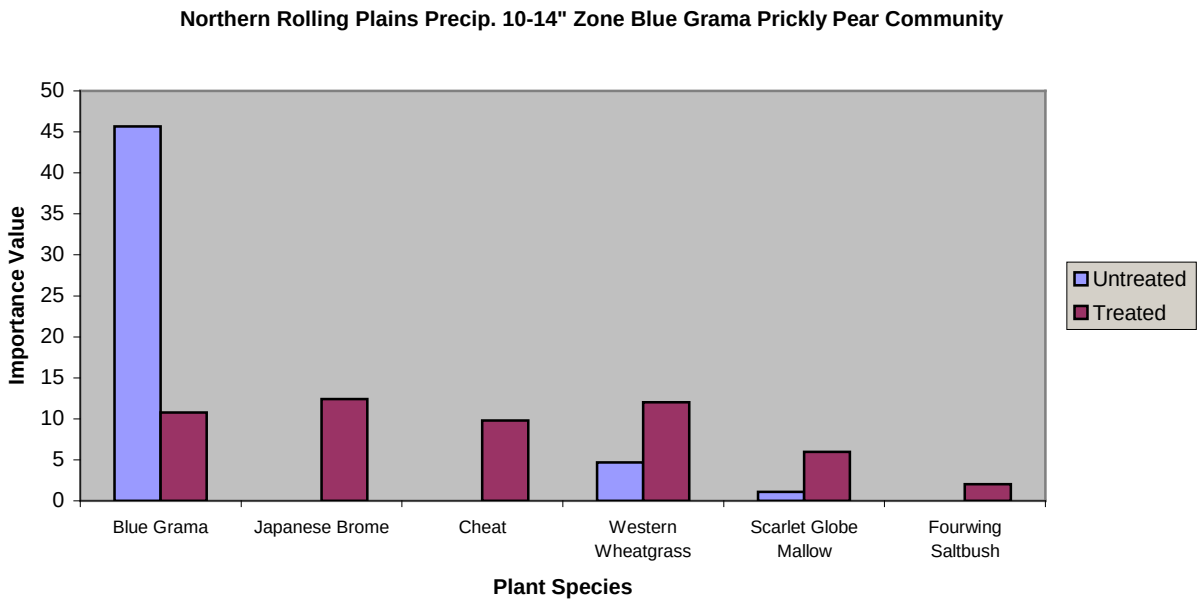

Figure 1. Shows the affects the aerator/broadcast seeder had on the blue grama community. There is a substantial decrease in blue grama. Western wheatgrass and annual bromes substantially increased. Blue grama forms a sod that remains in a steady state unless some disturbance breaks the sod mat. Scarlet globemallow (*Sphaeralcea coccinea*) increased in the aeration site. Fourwing saltbush-Natrona cultivar(*Atriplex canescens*), which was seeded, also increased.

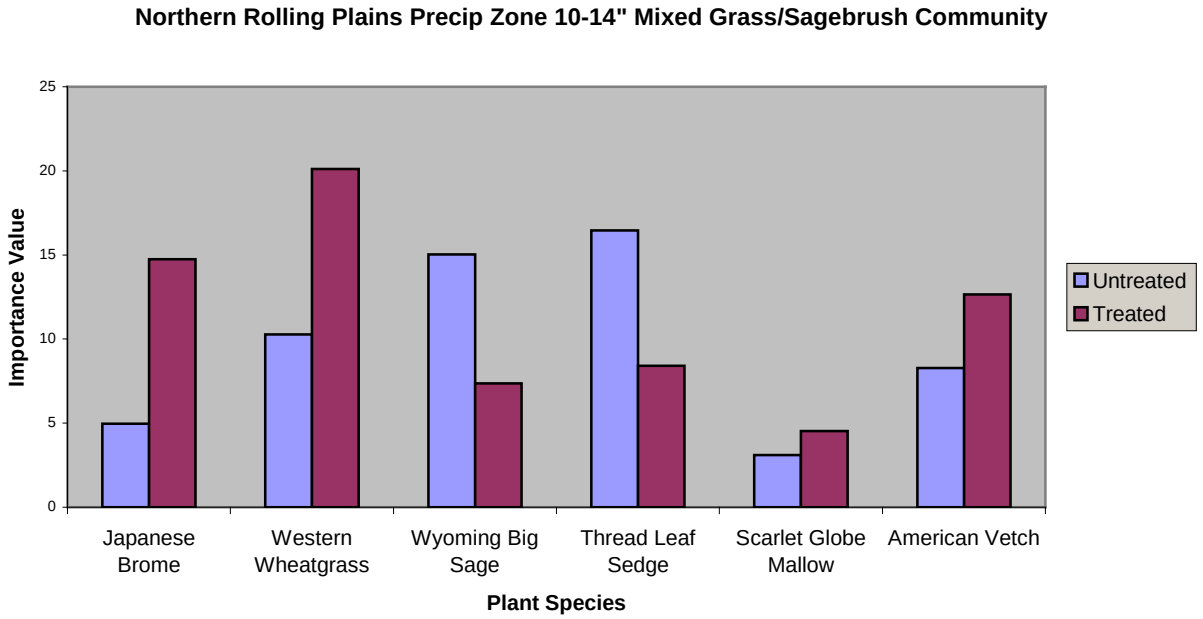

Figure 2. Treatment of the mixed grass/sagebrush community resulted in a large increase in western wheatgrass while keeping the sagebrush component in the system. There was also a decline in threadleaf sedge, which decreases rangeland production. The crown closure of Wyoming big sagebrush was reduced with little mortality of existing plants. Forbs such as American vetch and scarlet globemallow increased.

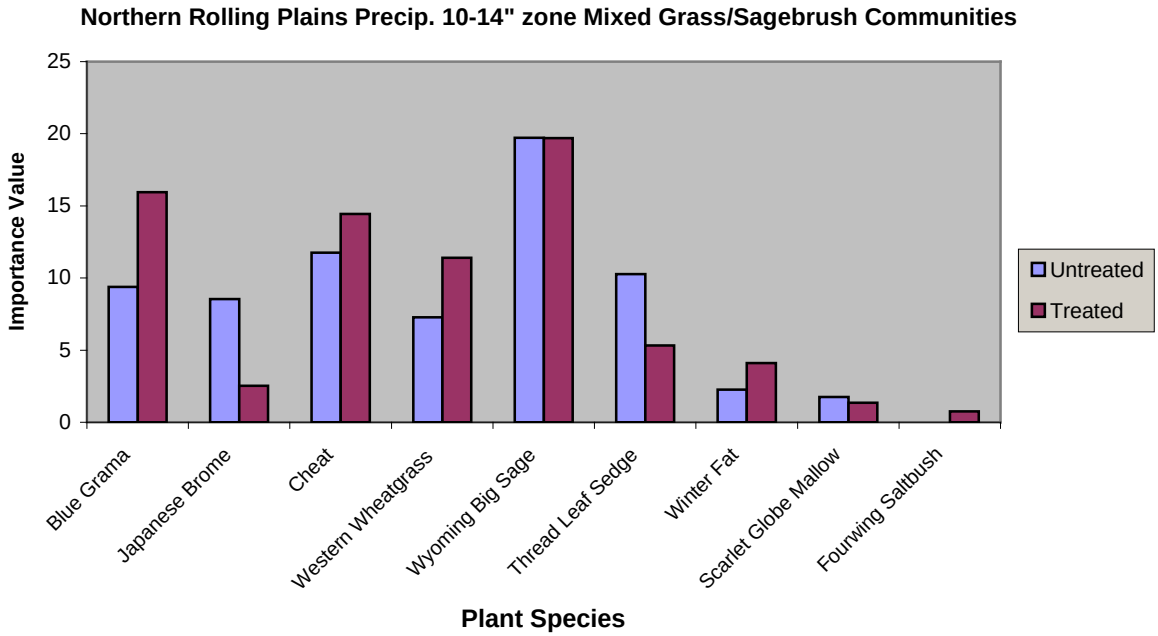

Figure 3. Another treatment in a mixed grass/sagebrush community resulted in a slight increase in blue grama. Annual bromes are prevalent both inside and outside the treatment area. Western wheatgrass and winterfat importance values increased in the treatment area. Winterfat and fourwing saltbush were used in the seed mix on this site.

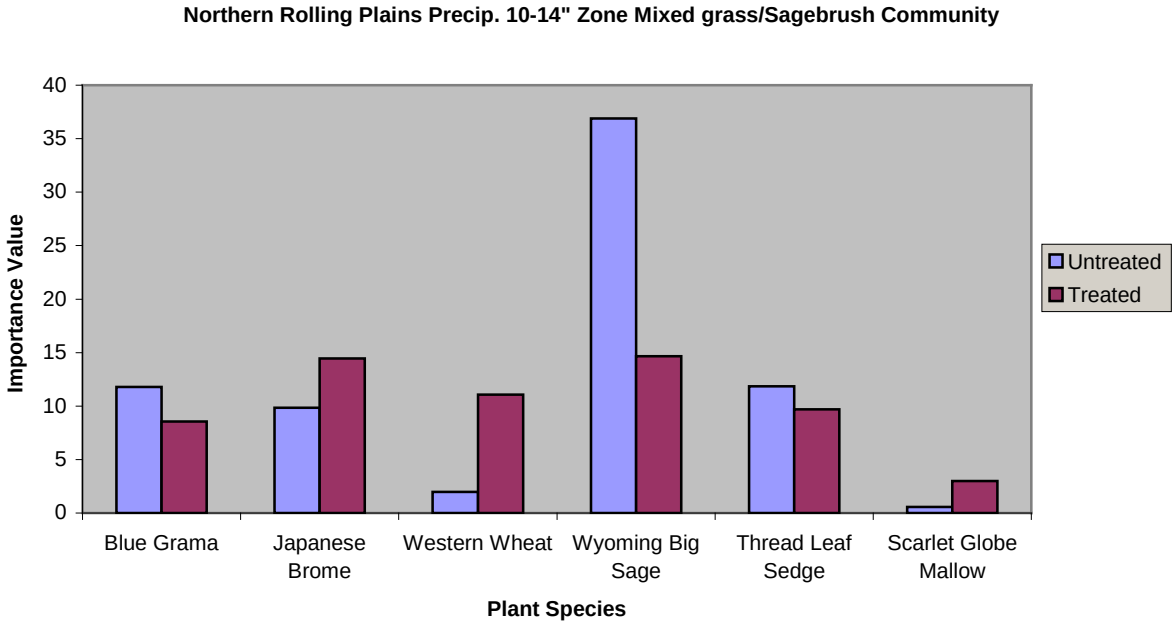

Figure 4. This graph shows another example of treatment results from a mixed grass/sagebrush community. Western wheatgrass shows substantial benefits from the aeration. Species such as blue grama and thread leaf sedge, which are less desirable grass species, show a decrease in the site. Forbs such as scarlet globe mallow increased in the aeration site.

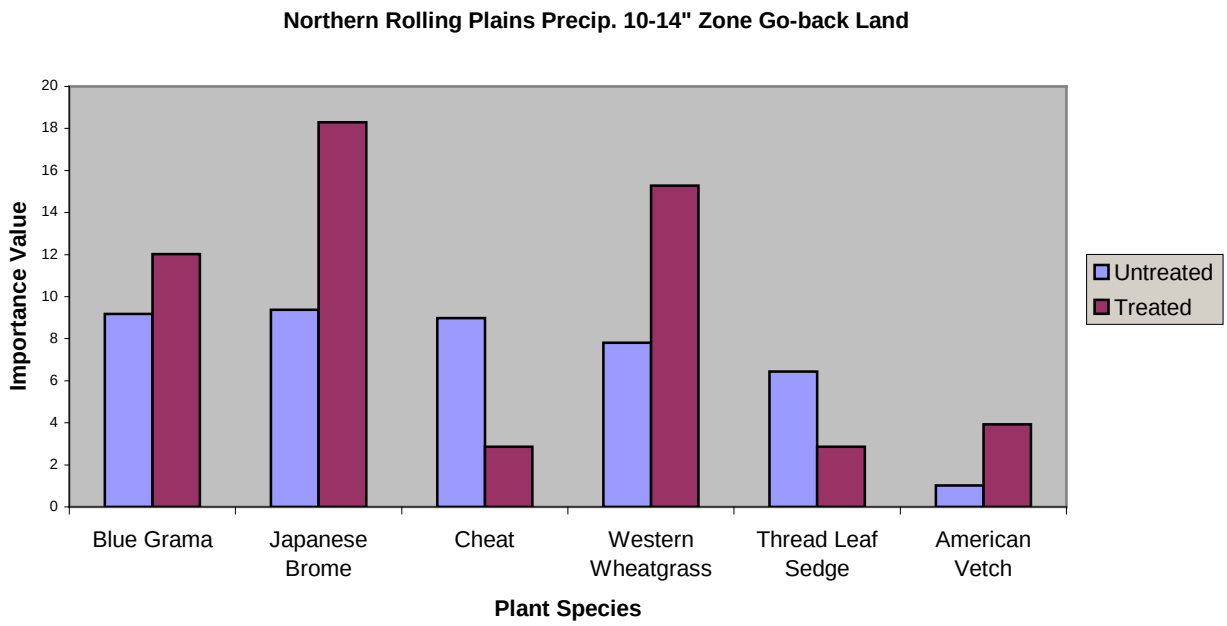

Figure 5. Again, western wheatgrass and Japanese brome increased in the treatment site. On these go-back lands, the broadcasted American vetch was substantially increased.

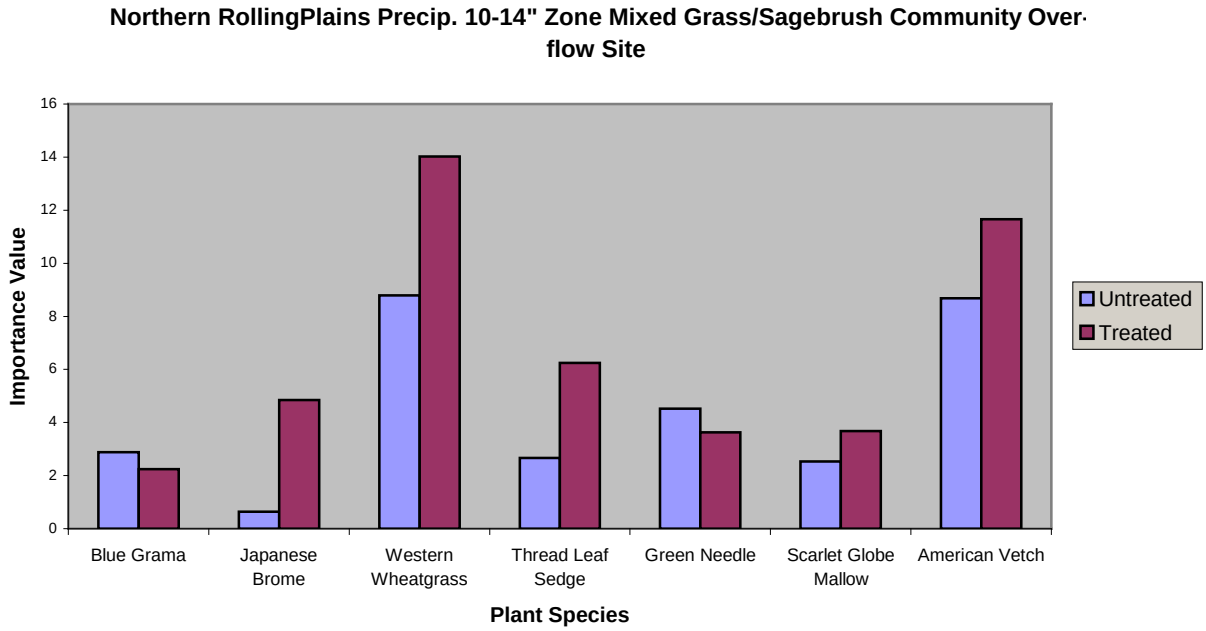

Figure 6. Treatment of an overflow site resulted in an increase in western wheatgrass and Japanese brome. Green needlegrass (*Nassella viridula*) and blue grama stayed approximately the same. Scarlet globemallow and American vetch showed an increase, which should improve sage-grouse brood survival.

Conclusion

Although some data errors may occur because of inadequate sample sizes, there is enough evidence to document the benefits and consequences of the treatment. Clay and clay loam soils coupled with low precipitation may be partially to blame for the lack of dramatic changes seen on other aeration sites. Low precipitation may have also reduced the germination of seeds in all areas.

Species such as blue grama, prickly pear and thread-leaf sedge hinder range productivity and prevent beneficial species from responding to proper management. Steps should be taken in these rangelands to restore habitat. The aerator is one tool that can be used to restore these complex sites.

During the summer of 2007, above average precipitation during the month of May resulted in an increase of annual bromes in northeastern Wyoming. Consequently, all treatment sites showed a noticeable increase in these annuals. Annuals are better adapted to take advantage of available moisture after several years of drought.

Management Recommendations

Aeration treatments may not be the most cost effective way to rehabilitate rangelands, but the treatment is an effective alternative to accelerating change on a landscape. Fire and chemical treatments have been used within the PRB to remove sagebrush in certain areas. In some cases the removal of this shrub can negatively affect the range. Aeration is a good way to treat dense stands of sagebrush without removing this vital shrub from the system. It also stimulates new growth of important forbs and graminoid species.

Aeration treatments should continue on low seral state lands were threadleaf sedge and blue grama sod mats have formed. These lands are considered to be in a steady state and will not change under most management practices unless the mat is disturbed.

Seed mixes should include native forbs such as yellow prairie coneflower, four wing saltbush, American vetch and winterfat. Some success has been seen with these species. Falcata alfalfa should be reconsidered as part of the seed mix. A less expensive dry land species such as *Spreador II* may perform as well or better. Managers should assure that environmental factors such as soil type, precipitation and site condition would meet the requirements of whichever cultivar is selected.

Literature Cited

Duabenmire, R. 1959. A Canopy-Coverage Method of Vegetational Analysis. Northwest Science 33:43-46.

Appendix I (Full Results)

Site 1 (Figure 1)

Untreated Nested Frequency and % Canopy Closure

Plant Species	F-1	%C 1	F-2	%C 2	F-3	%C 3	F-4	%C 4	F-5	%C 5	F-6	%C 6	F-7	%C 7	F-8	%C 8	F-9	%C 9	F-10	%C 10	Frequency: Average Frequency	Std Dev Frequency	80% CI +/-	Low 80% CI	High 80% CI	Canopy Cover: Average % Canopy	Std Dev % Canopy	80% CI +/-	Low 80%	High 80% CI	Importance Value: Relative % Canopy	Relative Frequency	Importance Value
Blue Grama	75	20	100	50	100	50	75	20	75	70	100	70	100	70	100	50	75	50	75	70	87.5	13.176	5.330795	82.16	92.83079498	52	19.322	7.830	44.170	59.830	0.687	0.246	45.637
Japanese Brome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Cheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Pepper Weed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Lichen	100	10	75	10	100	10	75	3	100	10	75	10	75	10	75	10	100	10	100	10	87.5	13.176	5.330795	82.16	92.83079498	9.3	2.214	0.897	8.403	10.197	0.119	0.246	18.280
Plantain	0	0	0	0	0	0	0	0	0	0	0	0	75	0.3	0	0	0	0	0	0	7.5	23.717	9.611931	-2.11	17.11163096	0.03	0.095	0.038	-0.008	0.068	0.000	0.021	1.076
Western Wheat	75	3	0	0	75	0.3	0	0	50	0.3	0	0	25	0.3	0	0	0	0	75	3	30	34.960	14.16877	15.83	44.16877712	0.69	1.325	0.497	0.193	1.187	0.009	0.085	4.688
Wyoming Big Sage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Thread Leaf Sedge	100	3	75	20	100	20	100	10	75	10	75	10	75	10	75	10	100	10	100	20	87.5	13.176	5.330795	82.16	92.83079498	12.3	5.736	2.325	9.975	14.625	0.158	0.246	20.209
Winter Fat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Prickly Pear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Green Needle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Flax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Scarlet Globe Mallow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	0.3	0	0	0	0	7.5	23.717	9.611931	-2.11	17.11163096	0.03	0.095	0.038	-0.008	0.068	0.000	0.021	1.076
Fouwing Saltbush	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Broom Snake Weed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
American Vetch	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Sego-lily	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Unkown Aster	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Rabbit brush	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	3	0	0	0	0	2.5	7.906	3.203077	-0.70	5.703076986	0.3	0.949	0.384	-0.084	0.684	0.004	0.007	0.544
Smallseed falseflax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Prairie Cone???	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Birds foot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Fringed Sage Wort	0	0	0	0	0	0	25	3	25	10	0	0	0	0	75	3	50	10	50	3	22.5	27.513	11.149819	11.35	33.64981826	2.9	3.985	1.615	1.285	4.515	0.037	0.063	5.020
Needle and thread	25	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.5	7.906	3.203077	-0.70	5.703076986	0.03	0.095	0.038	-0.008	0.068	0.000	0.007	0.371
Sandberg blue	0	0	0	0	0	0	0	0	0	0	75	0.3	0	0	0	0	0	0	0	0	7.5	23.717	9.611931	-2.11	17.11163096	0.03	0.095	0.038	-0.008	0.068	0.000	0.021	1.076
yuka	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	3	2.5	7.906	3.203077	-0.70	5.703076986	0.3	0.949	0.384	-0.084	0.684	0.004	0.007	0.544
Loco Weed	0	0	0	0	25	0.3	25	0.3	0	0	0	0	50	0.3	0	0	0	0	0	0	10	17.480	7.0840089	2.92	17.08400890	0.09	0.145	0.059	0.031	0.149	0.001	0.028	1.498

Treated Nested Frequency and % Canopy Closure

Plant Species	F-1	%C 1	F-2	%C 2	F-3	%C 3	F-4	%C 4	F-5	%C 5	F-6	%C 6	F-7	%C 7	F-8	%C 8	F-9	%C 9	F-10	%C 10	Frequency: Average Frequency	Std Dev Frequency	80%	Low 80% CI	High 80% CI	Canopy Cover: Average % Canopy	Std Dev % Canopy	80% CI +/-	Low 80% CI	High 80% CI	Importance Value: Relative % Canopy	Relative Frequency	Importance Value
Blue Grama	75	10	0	0	0	0	100	3	75	10	75	3	25	3	25	3	25	3	100	10	50	39.087	16	34.16	65.84039177	4.5	3.979	1.613	2.887	6.113	0.114	0.101	10.751
Japanese Brome	0	0	75	3	25	3	75	3	75	10	75	10	100	3	75	10	75	10	0	0	57.5	35.463	14	43.13	71.86791862	5.2	4.290	1.738	3.462	6.938	0.132	0.116	12.407
Cheat	0	0	0	0	0	0	75	3	0	0	0	0	0	0	100	40	100	10	25	0.3	30	43.780	18	12.26	47.74226736	5.33	12.583	5.099	0.231	10.429	0.135	0.061	9.794
Pepper Weed	0	0	75	3	0	0	75	0.3	0	0	100	3	50	3	50	3	25	3	0	0	37.5	37.731	15	22.21	52.7908459	1.53	1.552	0.629	0.901	2.159	0.039	0.076	5.730
Lichen	75	3	75	0.3	75	0.3	75	3	75	3	0	0	75	3	25	3	75	3	75	3	62.5	27.003	11	51.56	73.44332325	2.16	1.355	0.549	1.611	2.709	0.055	0.126	9.054
Plantain	0	0	0	0	25	0.3	100	3	75	3	75	10	50	3	0	0	0	0	25	0.3	35	37.639	15	19.75	50.25250546	1.96	3.140	1.273	0.687	3.233	0.050	0.071	6.029
Western Wheat	0	0	100	10	100	3	75	10	0	0	75	3	75	10	75	3	0	0	75	10	57.5	40.910	17	40.92	74.07959201	4.9	4.557	1.847	3.053	6.747	0.124	0.116	12.036
Wyoming Big Sage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	##	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Thread Leaf Sedge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	##	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Winter Fat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	##	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Prickly Pear	75	10	0	0	0	0	25	3	50	3	0	0	50	3	0	0	0	0	75	20	27.5	32.167	13	14.46	40.53610087	3.9	6.454	2.616	1.284	6.516	0.099	0.056	7.727
Green Needle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	##	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Flax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	##	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Scarlet Globe Mallow	0	0	0	0	50	3	0	0	75	3	75	10	75	3	0	0	0	0	75	0.3	35	37.639	15	19.75	50.25250546	1.93	3.159	1.280	0.650	3.210	0.049	0.071	5.986
Fouwing Saltbush	75	3	0	0	50	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.5	27.003	11	1.56	23.44332325	0.6	1.265	0.513	0.087	1.113	0.015	0.025	2.024
Broom Snake Weed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	##	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
American Vetch	0	0	25	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.5	7.906	3	-0.70	5.703076986	0.3	0.949	0.384	-0.084	0.684	0.008	0.005	0.639
Sego-lily	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	##	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Unkown Aster	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	##	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Rabbit brush	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	##	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Smallseed falseflax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	##	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Prairie Cone???	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	##	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Birds foot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	##	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Fringed Sage Wort	75	20	25	3	75	3	0	0	25	3	0	0	0	0	0	0	75	10	0	0	27.5	34.258	14	13.62	41.38046094	3.9	6.454	2.616	1.284	6.516	0.099	0.056	7.727
Needle and thread	75	3	0	0	25	10	0	0	0	0	0	0	25	3	0	0	50	3	25	3	20	25.820	10	9.54	30.46081842	2.2	3.120	1.264	0.936	3.464	0.056	0.040	4.812
Sandberg blue	75	3	0	0	0	0	0	0	100	3	0	0	0	0	0	0	0	0	75	0.3	25	40.825	17	8.46	41.54474961	0.63	1.253	0.508	0.122	1.138	0.016	0.051	3.325
yuka	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	##	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Loco Weed	75	3	0	0	0	0	50	0.3	0	0	0	0	0	0	0	0	0	0	0	0	12.5	27.003	11	1.56	23.44332325	0.33	0.943	0.382	-0.052	0.712	0.008	0.025	1.681
Falcada	0	0	0	0	0	0	25	0.3	0	0	0	0	0	0	0	0	0	0	0	0	2.5	7.906	3	-0.70	5.703076986	0.03	0.095	0.038	-0.008	0.068	0.001	0.005	0.291

Site 2 (Figure 2)

Untreated Nested Frequency and % Canopy Closure

Treated Nested Frequency and % Canopy Closure

Site 3 (Figure 3)

Untreated (Control) Nested Frequency and % Canopy Closure

Shrub Transect 19.00%

Plant Species	F-1	%C-1	F-2	%C-2	F-3	%C-3	F-4	%C-4	F-5	%C-5	F-6	%C-6	F-7	%C-7	F-8	%C-8	F-9	%C-9	F-10	%C-10	Frequency: Average Frequency	Frequency: Std Dev Frequency	Frequency: 80% CI +/-	Frequency: Low 80% CI	Frequency: High 80% CI	Canopy Cover: Average % Canopy	Canopy Cover: Std Dev % Canopy	Canopy Cover: 80% CI +/-	Canopy Cover: Low 80% CI	Canopy Cover: High 80% CI	Importance Value: Relative % Canopy	Importance Value: Relative Frequency	Importance Value: Importance Value
Blue Grama	100	10	100	10	100	10	75	10	25	3	0	0	75	3	25	3	3	0	0	0	50	44.096	17.07037	32.13	67.87037203	4.9	4.997	1.047	3.853	6.147	0.093	0.080	9.307
Japanese Brome	50	5	25	3	25	3	75	3	75	3	75	5	75	3	50	3	75	3	75	3	50	31.082	8.543872	51.46	98.54387198	3	0.000	#N/A	#N/A	#N/A	0.057	0.114	8.559
Cheat	75	3	75	10	75	3	75	3	75	3	100	3	100	10	75	3	75	3	75	3	80	10.541	4.271938	75.73	84.27193898	4.4	2.951	1.196	3.204	5.596	0.083	0.152	11.757
Pepper Weed	75	3	75	3	75	3	75	3	100	3	100	3	100	5	75	3	0	0	75	3	75	28.868	11.69898	63.30	86.69898464	2.9	1.197	0.485	2.415	3.385	0.055	0.142	9.863
Lichen	75	0.3	25	0.3	25	3	75	3	0	0	0	0	0	0	25	3	0	0	0	0	22.5	29.100	12.12993	10.37	34.62966625	0.96	1.413	0.573	0.387	1.533	0.018	0.043	3.043
Plantain	75	3	100	3	75	3	75	10	25	0.3	50	3	50	3	0	0	0	0	0	0	45	36.889	14.96114.8	30.06	59.96114.2593	2.61	3.831	1.276	1.314	3.746	0.049	0.086	6.664
Western Wheatgrass	50	3	25	0.3	75	3	25	3	75	3	75	3	0	0	50	3	50	3	100	3	52.5	29.930	12.13663	40.37	66.62966625	2.43	7.238	0.489	1.942	2.919	0.046	0.100	7.261
Wyoming Big Sage	0	0	0	0	0	0	0	0	25	30	75	40	75	10	75	5	75	40	75	40	40	37.639	15.26936	24.75	55.26936348	16.6	18.293	7.413	9.187	24.013	0.159	0.076	19.738
Thread Leaf Sedge	75	10	25	0.3	0	0	75	3	0	0	0	0	0	0	75	50	100	10	0	0	35	41.164	16.68393	18.37	51.68396379	7.33	15.534	6.296	1.036	13.630	0.139	0.084	10.211
Winter Fat	0	0	35	0.3	0	0	0	0	75	3	0	0	0	0	75	3	0	0	0	0	17.5	31.250	12.66131	4.87	30.18131547	0.63	1.353	0.508	0.120	1.138	0.012	0.051	2.396
Prickly Pear	0	0	0	0	100	40	50	0.3	0	0	0	0	0	0	0	0	0	0	0	0	10	33.747	13.67524	1.10	35.07524031	4.03	13.638	5.123	-3.093	9.153	0.076	0.038	5.345
Green Needle	0	0	0	0	75	10	0	0	0	0	0	0	25	3	0	0	75	3	25	3	20	30.732	12.45405	7.55	32.45405005	1.9	3.179	1.200	0.612	3.188	0.036	0.030	2.698
Flax	0	0	0	0	0	0	25	3	0	0	0	0	0	0	0	0	0	0	0	0	2.5	7.906	3.20307	-0.70	5.703076986	0.3	0.949	0.384	-0.084	0.684	0.006	0.005	0.022
Scarlet Globe Mallow	0	0	0	0	0	0	0	0	0	0	0	0	50	3	0	0	75	3	0	0	12.5	27.950	10.94333	1.56	23.44332325	0.6	1.266	0.513	0.087	1.113	0.011	0.024	1.758

Treated Nested Frequency and % Canopy Closure

Shrub Transect 8.67%

Plant Species	F-1	%C-1	F-2	%C-2	F-3	%C-3	F-4	%C-4	F-5	%C-5	F-6	%C-6	F-7	%C-7	F-8	%C-8	F-9	%C-9	F-10	%C-10	Frequency: Average Frequency	Frequency: Std Dev Frequency	Frequency: 80% CI	Frequency: Low 80% CI	Frequency: High 80% CI	Canopy Cover: Average % Canopy	Canopy Cover: Std Dev % Canopy	Canopy Cover: 80% CI +/-	Canopy Cover: Low 80% CI	Canopy Cover: High 80% CI	Importance Value: Relative % Canopy	Importance Value: Relative Frequency	Importance Value: Importance Value
Blue Grama	0	0	0	0	75	0.3	0	0	100	3	0	0	25	3	0	0	0	0	0	0	20	36.693	5.06	34.94	34.94142593	0.63	1.283	0.508	0.122	1.138	0.014	0.037	2.539
Japanese Brome	75	10	75	10	100	3	75	10	75	10	75	3	50	3	75	3	100	3	100	10	80	15.811	73.69	66.45775397	93.54224603	6.5	3.689	1.486	5.005	7.995	0.141	0.147	14.436
Cheat	100	3	75	3	75	3	75	10	50	3	100	10	75	3	75	0.3	100	50	0	0	72.5	29.930	50.37	94.62966625	145.3703375	8.53	14.972	6.068	2.462	14.598	0.185	0.134	15.949
Pepper Weed	25	0.3	50	3	100	3	75	3	75	3	75	3	75	3	75	3	75	3	75	3	70	19.720	62.01	77.99187333	132.0081267	2.73	0.854	0.346	2.384	3.076	0.059	0.129	9.418
Lichen	0	0	0	0	0	0	50	3	75	0.3	0	0	50	0.3	75	3	0	0	75	0.3	32.5	35.453	18.13	46.86791882	78.13208118	0.69	1.235	0.497	0.193	1.187	0.015	0.060	3.745
Plantain	25	0.3	0	0	75	3	75	3	75	10	75	3	75	10	100	3	0	0	75	3	57.5	35.453	43.13	71.86791882	101.3179812	3.53	3.659	1.483	2.047	5.013	0.077	0.106	9.135
Western Wheat	75	10	75	3	75	3	75	3	75	3	100	3	75	3	100	3	75	3	75	3	80	10.541	75.73	84.27193898	155.7280611	3.7	2.214	0.897	2.803	4.597	0.080	0.147	11.394
Wyoming Big Sage	75	10	100	40	25	3	100	30	0	0	25	3	0	0	75	10	25	3	75	40	50	39.087	34.16	65.84039177	134.1596083	13.9	16.313	6.611	7.289	20.511	0.302	0.092	19.706
Thread Leaf Sedge	0	0	0	0	0	0	74	10	0	0	0	0	75	10	0	0	0	0	75	10	22.4	36.068	7.76	37.01717158	59.98282842	3	4.830	1.958	1.042	4.958	0.065	0.041	5.324
Winter Fat	0	0	0	0	0	0	25	3	0	0	0	0	25	3	100	3	75	3	75	0.3	30	38.730	14.30	45.69672763	74.30327237	1.23	1.526	0.618	0.612	1.848	0.027	0.095	4.102
Prickly Pear	0	0	25	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.5	7.906	-0.70	5.703076986	12.29692301	0.3	0.949	0.384	-0.084	0.684	0.007	0.005	0.556
Green Needle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	#N/A	#N/A	#N/A	0	0.000	#N/A	#N/A	#N/A	0.000	0.000	0.000
Flax	0	0	0	0	0	0	0	0	0	0	50	3	25	0.3	0	0	0	0	0	0	7.5	16.874	0.66	14.33827413	22.66172587	0.33	0.943	0.382	-0.052	0.712	0.007	0.014	1.050
Scarlet Globe Mallow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	3	50	3	0	0	7.5	16.874	0.66	14.33827413	22.66172587	0.6	1.265	0.513	0.087	1.113	0.013	0.014	1.343
Fringing Sagebush	0	0	0	0	25	0.3	0	0	0	0	0	0	50	0.3	0	0	0	0	0	0	7.5	16.874	0.66	14.33827413	22.66172587	0.06	0.126	0.051	0.009	0.111	0.001	0.014	0.757
Broom Snake Weed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	3	0	0	0	0	2.5	7.906	-0.70	5.703076986	12.29692301	0.3	0.949	0.384	-0.084	0.684	0.007	0.005	0.556

Site 4 (Figure 4)

Untreated Nested Frequency and % Canopy Closure

Plant Species	F 1	%C 1	F 2	%C 2	F 3	%C 3	F 4	%C 4	F 5	%C 5	F 6	%C 6	F 7	%C 7	F 8	%C 8	F 9	%C 9	F 10	%C 10
Blue Grama	75	20	75	3	0	0	75	3	75	3	75	3	75	10	75	10	50	0.5	25	0.5
Japanese Brome	75	3	75	3	75	0.5	100	3	50	3	75	3	75	3	25	3	75	3	25	3
Cheat	25	3	25	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pepper Weed	75	0.5	50	0.5	0	0	100	0.5	25	0.5	50	0.5	75	0.5	25	0.5	75	0.5	0	0
Lichen	75	0.5	0	0	0	0	75	0.5	75	0.5	75	0.5	100	0.5	75	3	75	0.5	25	3
Plantain	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0.5	0	0	0	0
Western Wheat	0	0	0	0	0	0	0	0	75	3	50	3	0	0	0	0	0	0	0	0
Wyoming Big Sage	0	10	100	40	75	80	0	0	75	30	100	10	0	0	50	20	100	20	100	50
Thread Leaf Sedge	75	3	50	3	100	3	0	0	100	10	75	10	75	10	75	3	75	3	25	3
Winter Fat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prickly Pear	0	0	25	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green Needle	0	0	0	0	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flox	0	0	0	0	0	0	75	0.5	25	0.5	0	0	75	0.5	0	0	50	1	0	0
Scarlet Globe Mallow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	1
Foaming Saltbush	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Broom Snake Weed	0	0	0	0	0	0	0	0	0	0	0	0	50	0.5	0	0	0	0	0	0
American Vetch	0	3	0	0	75	1	0	0	0	0	0	0	75	0.5	0	0	0	0	50	3
Sego lily	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unkown Aster	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabbit brush	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smallseed falseflax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0.5	0	0
Prairie Cone???	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Birds foot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fringed Sage Wort	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Needle and thread	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sandberg blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
yuka	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loco Weed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Falcada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prairie June Grass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biscuit Root	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
onion grass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gay Feather	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Woody Aster	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wild Onion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
danthonia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
blue bunch wheat grass	0	0	0	0	0	0	25	3	75	10	0	0	0	0	50	3	75	3	0	0

Plant Species	Frequency: Average Frequency	Std Dev Frequency	80% CI +/-	Low 80% CI	High 80% CI	Canopy Cover: Average % Canopy	Std Dev % Canopy	80% CI +/-	Low 80% CI	High 80% CI	Importance Value: Relative % Canopy	Relative Frequency	Importance Value
Blue Grama	60	26.074	10.891000	49.11	70.89100751	5.3	6.266	2.547	2.753	7.847	0.104	0.122	11.774
Japanese Brome	65	24.152	8.7900059	56.21	73.79000597	2.75	0.791	0.320	2.430	3.070	0.054	0.132	9.301
Cheat	5	10.541	4.271836	0.73	9.27183681	0.36	0.844	0.383	-0.023	0.733	0.007	0.011	0.893
Pepper Weed	47.5	34.256	13.885467	33.62	61.38546734	0.4	0.211	0.085	0.315	0.485	0.008	0.104	5.611
Lichen	57.5	35.403	14.387515	43.13	71.88751582	0.9	1.126	0.456	0.444	1.356	0.018	0.126	7.196
Plantain	2.5	7.906	3.203877	-0.70	5.70387698	0.05	0.158	0.064	-0.014	0.114	0.001	0.005	0.324
Western Wheat	12.5	27.003	10.940325	1.56	23.44032525	0.6	1.265	0.513	0.087	1.113	0.012	0.027	1.950
Wyoming Big Sage	60	44.410	17.997595	42.02	77.99759489	31	32.126	13.020	17.980	44.020	0.606	0.132	36.976
Thread Leaf Sedge	65	31.623	12.815808	52.19	77.81580714	4.8	3.706	1.502	3.298	6.302	0.094	0.143	11.806
Winter Fat	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Prickly Pear	2.5	7.906	3.203877	-0.70	5.70387698	1	3.162	1.282	-0.282	2.282	0.020	0.005	1.257
Green Needle	2.5	7.906	3.203877	-0.70	5.70387698	0.1	0.316	0.128	-0.028	0.228	0.002	0.005	0.366
Flox	22.5	32.167	13.036103	9.46	35.53610357	0.25	0.425	0.172	0.078	0.422	0.005	0.049	2.717
Scarlet Globe Mallow	2.5	7.906	3.203877	-0.70	5.70387698	0.1	0.316	0.128	-0.028	0.228	0.002	0.005	0.366
Foaming Saltbush	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Broom Snake Weed	5	15.811	6.407754	-1.41	11.40775397	0.05	0.158	0.064	-0.014	0.114	0.001	0.011	0.588
American Vetch	20	32.914	13.338004	6.66	33.33800350	0.85	1.423	0.577	0.273	1.427	0.019	0.044	3.126
Sego lily	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Unkown Aster	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Rabbit brush	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Smallseed falseflax	2.5	7.906	3.203877	-0.70	5.70387698	0.05	0.158	0.064	-0.014	0.114	0.001	0.005	0.324
Prairie Cone???	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Birds foot	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Fringed Sage Wort	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Needle and thread	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Sandberg blue	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
yuka	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Loco Weed	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Falcada	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Prairie June Grass	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Biscuit Root	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
onion grass	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Gay Feather	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Woody Aster	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Wild Onion	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
danthonia	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
blue bunch wheat grass	22.5	32.167	13.036103	9.46	35.53610357	1.9	3.178	1.288	0.612	3.188	0.037	0.049	4.330

Treated Nested Frequency and % Canopy Closure

Plant Species	F 1	%C 1	F 2	%C 2	F 3	%C 3	F 4	%C 4	F 5	%C 5	F 6	%C 6	F 7	%C 7	F 8	%C 8	F 9	%C 9	F 10	%C 10
Blue Grama	0	0	100	3	75	3	75	10	75	3	25	3	100	3	75	3	100	3	0	0
Japanese Brome	75	10	75	10	75	10	75	3	100	3	100	3	75	10	75	3	75	3	100	10
Cheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pepper Weed	50	0.5	75	3	75	3	100	3	100	3	75	10	75	3	75	3	75	3	100	3
Lichen	100	10	75	3	75	3	75	3	100	0.5	75	0.5	75	0.5	100	3	100	0.5	75	0.5
Plantain	0	0	75	3	25	0.5	100	3	75	0.5	75	3	0	0	75	0.5	75	0.5	25	0.5
Western Wheat	75	10	75	3	75	3	75	3	75	10	75	3	100	3	75	0.5	100	0.5	100	3
Wyoming Big Sage	100	20	25	20	0	0	50	10	75	3	0	0	75	30	50	3	50	3	0	0
Thread Leaf Sedge	75	10	75	3	100	3	75	3	50	3	75	3	0	0	100	3	75	3	100	3
Winter Fat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prickly Pear	0	0	0	0	0	0	0	0	0	0	0	0	75	3	0	0	0	0	0	0
Green Needle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flox	75	0.5	0	0	25	3	75	3	75	3	75	3	25	3	75	0.5	0	0	25	0.5
Scarlet Globe Mallow	0	0	75	3	0	0	0	0	0	0	100	3	0	0	0	0	0	0	75	3
Foaming Saltbush	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Broom Snake Weed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
American Vetch	75	10	0	0	75	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sego lily	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unkown Aster	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabbit brush	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smallseed falseflax	0	0	0	0	0	0	25	0.5	75	3	25	0.5	25	3	0	0	0	0	0	0
Prairie Cone???	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Birds foot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fringed Sage Wort	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Needle and thread	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sandberg blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
yuka	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loco Weed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Falcada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prairie June Grass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
wild onion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	3	0	0	0	0
danthonia	0	0	0	0	0	0	0	0	25	0.5	0	0	25	3	0	0	0	0	0	0
Stragalous	75	0.5	25	0.5	0	0	0	0	25	0.5	0	0	0	0	0	0	0	0	0	0

Plant Species	Frequency: Average Frequency	Std Dev Frequency	80% CI +/-	Low 80% CI	High 80% CI	Canopy Cover: Average % Canopy	Std Dev % Canopy	80% CI +/-	Low 80% CI	High 80% CI	Importance Value: Relative % Canopy	Relative Frequency	Importance Value
Blue Grama	62.5	39.528	16	46.48	78.51938403	3.1	2.726	1.105	1.995	4.205	0.061	0.091	8.571
Japanese Brome	82.5	12.076	4.89	77.61	87.39400294	6.5	3.689	1.495	5.005	7.995	0.169	0.120	14.442
Cheat	0	0.000	####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Pepper Weed	80	15.811	6.41	73.59	86.40775397	3.45	2.432	0.986	2.464	4.436	0.090	0.116	10.299
Lichen	85	12.910	5.23	79.77	90.23190821	2.45	2.929	1.187	1.263	3.637	0.064	0.124	9.364
Plantain	52.5	36.228	14.7	37.82	67.18200881	1.15	1.292	0.524	0.626	1.674	0.030	0.076	5.312
Western Wheat	82.5	12.076	4.89	77.61	87.39400294	3.9	3.373	1.367	2.533	5.267	0.101	0.120	11.065
Wyoming Big Sage	42.5	35.453	14.4	28.13	56.86711862	8.9	10.723	4.346	4.554	13.246	0.231	0.062	14.649
Thread Leaf Sedge	72.5	29.930	12.1	60.37	84.62998825	3.4	2.503	1.015	2.385	4.415	0.088	0.105	9.669
Winter Fat	0	0.000	####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Prickly Pear	7.5	23.717	9.61	-2.11	17.11163096	0.3	0.949	0.384	-0.084	0.684	0.008	0.011	0.935
Green Needle	0	0.000	####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Flox	45	32.914	13.3	31.66	58.33800350	1.65	1.435	0.581	1.069	2.231	0.043	0.065	5.410
Scarlet Globe Mallow	25	40.825	16.5	8.46	41.54474961	0.9	1.449	0.587	0.313	1.487	0.023	0.036	2.867
Foaming Saltbush	0	0.000	####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Broom Snake Weed	0	0.000	####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
American Vetch	15	31.623	12.8	2.18	27.81550754	1.3	3.199	1.296	0.004	2.596	0.034	0.022	2.779
Sego lily	0	0.000	####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Unkown Aster	0	0.000	####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Rabbit brush	0	0.000	####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Smallseed falseflax	15	24.152	9.79	5.21	24.79000597	0.7	1.229	0.498	0.202	1.198	0.018	0.022	2.000
Prairie Cone???	0	0.000	####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Birds foot	0	0.000	####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Fringed Sage Wort	0	0.000	####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Needle and thread	0	0.000	####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Sandberg blue	0	0.000	####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
yuka	0	0.000	####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Loco Weed	0	0.000	####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Falcada	0	0.000	####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Prairie June Grass	0	0.000	####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
wild onion	2.5	7.906	3.2	-0.70	5.70387698	0.3	0.949	0.384	-0.084	0.684	0.008	0.004	0.571
danthonia	5	10.541	4.27	0.73	9.27183681	0.35	0.944	0.383	-0.033	0.733	0.009	0.007	0.819
Stragalous	12.5	24.296	9.85	2.65	22.34809544	0.15	0.242	0.098	0.052	0.248	0.004	0.018	1.104

Site 5 (Figure 5)

Untreated Nested Frequency and % Canopy Closure

| | | |

Site 6 (Figure 6)

Treated Nested Frequency and % Canopy Closure

Plant Species	F-1	%C 1	F-2	%C 2	F-3	%C 3	F-4	%C 4	F-5	%C 5	F-6	%C 6	F-7	%C 7	F-8	%C 8	F-9	%C 9	F-10	%C 10
Blue Grama	50	0.3	0	0	0	0	0	0	25	0.3	25	0.3	0	0	0	0	75	3	0	0
Japanese Brome	0	0	0	0	0	0	0	0	50	0.3	0	0	25	3	75	10	0	0	75	3
Cheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pepper Weed	25	0.3	25	0.3	75	3	25	0.3	75	3	75	0.3	75	0.3	75	3	75	0.3	75	3
Lichen	50	0.3	50	0.3	75	0.3	75	3	75	0.3	100	3	100	0.3	75	3	100	3	25	0.3
Plantain	0	0	0	0	50	3	75	3	75	3	75	3	50	3	75	3	75	3	75	3
Western Wheatgrass	75	3	75	3	100	3	75	10	75	3	100	3	75	3	100	3	100	3	75	3
Wyoming Big Sage	25	3	75	20	0	0	0	0	0	0	0	0	75	20	50	3	0	0	75	50
Thread Leaf Sedge	75	10	0	0	0	0	100	3	0	0	75	10	0	0	0	0	0	0	0	0
Winter Fat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prickly Pear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green Needle	50	3	75	3	75	3	25	0.3	0	0	0	0	0	0	0	0	0	0	0	0
Flax	0	0	25	0.3	25	0.3	25	0.3	0	0	0	0	0	0	75	3	0	0	0	0
Scarlet Globe Mallow	25	0.3	75	0.3	0	0	0	0	0	0	0	0	75	3	50	0.3	75	0.3	25	0.3
Foaming Saltbush	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Broom Snake Weed	0	0	75	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
American Vetch	75	3	100	3	75	3	100	3	75	3	75	3	75	3	75	3	75	3	50	0.3
Sego-lily	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown Aster	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabbit brush	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smallseed falseflax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prairie Cone???	0	0	0	0	0	0	25	3	0	0	0	0	0	0	0	0	0	0	0	0
Birds foot	0	0	75	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fringed Sage Wort	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Needle and thread	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sandberg blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
yuka	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loco Weed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Falcada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prairie June Grass	0	0	75	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biscuit Root	0	0	25	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
onion grass	0	0	0	0	0	0	50	0.3	0	0	0	0	0	0	0	0	0	0	0	0
Gay Feather	0	0	0	0	0	0	0	0	75	0.3	75	0.3	0	0	0	0	0	0	0	0

Plant Species	Frequency: Average Frequency	Std Dev Frequency	80% +/-	Low 80% CI	High 80% CI	Canopy Cover: Average % Canopy	Std Dev % Canopy	80% CI +/-	Low 80% CI	High 80% CI	Importance Value: Relative % Canopy	Relative Frequency	Importance Value
Blue Grama	17.5	26.484	10.7	6.77	28.23295507	0.39	0.928	0.376	0.014	0.766	0.014	0.031	2.237
Japanese Brome	22.5	32.167	13	9.46	35.53610087	1.63	3.189	1.292	0.338	2.922	0.057	0.040	4.850
Cheat	0	0.000	#####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Pepper Weed	60	24.152	9.79	50.21	69.79800587	1.38	1.394	0.565	0.815	1.945	0.048	0.107	7.740
Lichen	72.5	24.861	10.1	62.42	82.57910601	1.38	1.394	0.565	0.815	1.945	0.048	0.129	8.857
Plantain	55	30.732	12.5	42.55	67.45443505	2.4	1.265	0.513	1.887	2.913	0.084	0.098	9.085
Western Wheatgrass	85	12.910	5.23	79.77	90.23190921	3.7	2.214	0.897	2.803	4.597	0.129	0.151	14.024
Wyoming Big Sage	30	34.960	14.2	15.83	44.16607712	9.6	16.318	6.613	2.987	16.213	0.336	0.053	19.450
Thread Leaf Sedge	25	40.825	16.5	8.46	41.54474951	2.3	4.165	1.688	0.612	3.988	0.080	0.044	6.240
Winter Fat	0	0.000	#####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Prickly Pear	0	0.000	#####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Green Needle	22.5	32.167	13	9.46	35.53610087	0.93	1.431	0.580	0.350	1.510	0.033	0.040	3.626
Flax	15	24.152	9.79	5.21	24.79800587	0.39	0.928	0.376	0.014	0.766	0.014	0.027	2.015
Scarlet Globe Mallow	32.5	33.437	13.6	18.95	46.05089952	0.45	0.908	0.368	0.082	0.818	0.016	0.058	3.676
Foaming Saltbush	0	0.000	#####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Broom Snake Weed	7.5	23.717	9.61	-2.11	17.11163096	0.3	0.949	0.384	-0.084	0.684	0.010	0.013	1.191
American Vetch	77.5	14.191	5.75	71.75	83.2511352	2.73	0.854	0.346	2.384	3.076	0.095	0.138	11.862
Sego-lily	0	0.000	#####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Unknown Aster	0	0.000	#####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Rabbit brush	0	0.000	#####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Smallseed falseflax	0	0.000	#####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Prairie Cone???	2.5	7.906	3.2	-0.70	5.703675095	0.3	0.949	0.384	-0.084	0.684	0.010	0.004	0.747
Birds foot	7.5	23.717	9.61	-2.11	17.11163096	0.3	0.949	0.384	-0.084	0.684	0.010	0.013	1.191
Fringed Sage Wort	0	0.000	#####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Needle and thread	0	0.000	#####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Sandberg blue	0	0.000	#####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
yuka	0	0.000	#####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Loco Weed	0	0.000	#####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Falcada	0	0.000	#####	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Prairie June Grass	7.5	23.717	9.61	-2.11	17.11163096	0.3	0.949	0.384	-0.084	0.684	0.010	0.013	1.191
Biscuit Root	2.5	7.906	3.2	-0.70	5.703675095	0.03	0.095	0.038	-0.008	0.068	0.001	0.004	0.275
onion grass	5	15.811	6.41	-1.41	11.40771297	0.03	0.095	0.038	-0.008	0.068	0.001	0.009	0.497
Gay Feather	15	31.623	12.8	2.18	27.81580794	0.06	0.126	0.051	0.009	0.111	0.002	0.027	1.439

Untreated Nested Frequency and % Canopy Closure

Plant Species	F-1	%C 1	F-2	%C 2	F-3	%C 3	F-4	%C 4	F-5	%C 5	F-6	%C 6	F-7	%C 7	F-8	%C 8	F-9	%C 9	F-10	%C 10
Blue Grama	0	0	0	0	0	0	0	0	100	3	25	3	0	0	50	3	0	0	0	0
Japanese Brome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	3	0	0
Cheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pepper Weed	0	0	0	0	0	0	25	0.3	25	0.3	0	0	0	0	75	3	25	0.3	50	0.3
Lichen	0	0	0	0	50	0.3	0	0	0	0	75	0.3	0	0	75	0.3	0	0	75	0.3
Plantain	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Western Wheat	75	3	75	3	0	0	75	3	75	3	75	3	25	3	75	3	25	3	75	0.3
Wyoming Big Sage	75	10	0	0	50	10	0	0	75	40	25	10	100	50	100	0.3	100	30	100	10
Thread Leaf Sedge	0	0	0	0	0	0	0	0	0	0	75	10	0	0	0	0	0	0	25	3
Winter Fat	0	0	0	0	0	0	0	0	75	3	75	10	0	0	0	0	0	0	0	0
Prickly Pear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green Needle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	10	75	3	75	3
Flax	25	0.3	50	0.3	75	0.3	75	0.3	75	0.3	75	0.3	0	0	75	3	25	0.3	0	0
Scarlet Globe Mallow	0	0	75	3	0	0	0	0	0	0	75	3	0	0	25	0.3	0	0	0	0
Foaming Saltbush	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Broom Snake Weed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
American Vetch	75	3	50	3	75	0.3	50	0.3	50	3	50	3	0	0	75	3	100	3	75	3
Sego-lily	75	3	50	0.3	0	0	0	0	0	0	25	0.3	25	3	0	0	25	0.3	75	3
Unknown Aster	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	3	0	0
Rabbit brush	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smallseed falseflax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prairie Cone???	0	0	75	3	50	0.3	0	0	0	0	0	0	0	0	25	3	0	0	0	0
Birds foot	0	0	0	0	0	0	0	0	0	0	25	3	0	0	0	0	0	0	0	0
Fringed Sage Wort	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Needle and thread	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sandberg blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
yuka	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loco Weed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Falcada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prairie June Grass	75	3	75	3	50	3	75	3	50	3	0	0	0	0	0	0	0	0	0	0
Biscuit Root	0	0	75	3	0	0	0	0	0	0	50	3	25	3	0	0	0	0	0	0
onion grass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gay Feather	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Woody Aster	0	0	75	3	75	0.3	100	0.3	0	0	50	3	0	0	0	0	0	0	0	0
Wild Onion	0	0	25	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scurf Pea	0	0	0	0	0	0	75	20	75	3	0	0	0	0	50	3	0	0	0	0

Plant Species	Frequency: Average Frequency	Std Dev Frequency	80% CI +/-	Low 80% CI	High 80% CI	Canopy Cover: Average % Canopy	Std Dev % Canopy	80% CI +/-	Low 80% CI	High 80% CI	Importance Value: Relative % Canopy	Relative Frequency	Importance Value
Blue Grama	17.5	33.437	13.55580081	3.95	31.05580052	0.9	1.449	0.587	0.313	1.487	0.023	0.024	2.801
Japanese Brome	2.5	7.906	3.20377	-0.70	5.70367509	0.3	0.949	0.384	-0.084	0.684	0.008	0.005	0.634
Cheat	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Pepper Weed	20	25.820	10.45618	9.54	30.4561842	0.42	0.915	0.372	0.048	0.792	0.011	0.029	2.505
Lichen	27.5	36.228	14.68209	12.82	42.18208	0.12	0.155	0.063	0.057	0.183	0.003	0.054	2.851
Plantain	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Western Wheat	57.5	28.166	11.747549	45.75	69.2475495	2.43	1.204	0.488	1.942	2.918	0.063	0.113	8.799
Wyoming Big Sage	62.5	41.248	16.716202	45.78	79.2162327	16.03	25.111	10.100	5.930	26.130	0.453	0.123	30.771
Thread Leaf Sedge	10	24.152	9.788	0.21	19.788	1.3	3.156	1.296	0.004	2.596	0.034	0.020	2.849
Winter Fat	15	31.623	12.816	2.18	27.816	1.3	3.199	1.296	0.004	2.596	0.034	0.029	3.168
Prickly Pear	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Green Needle	25	40.825	16.5447	8.46	41.5447	1.6	3.204	1.299	0.301	2.899	0.041	0.040	4.529
Flax	47.5	32.167	13.036	34.46	60.536	0.51	0.864	0.350	0.160	0.860	0.013	0.065	6.517
Scarlet Globe Mallow	17.5	31.292	12.681	4.82	30.181	0.63	1.253	0.508	0.122	1.138	0.016	0.024	2.022
Foaming Saltbush	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Broom Snake Weed	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
American Vetch	60	26.874	10.89	49.11	70.89	2.16	1.355	0.549	1.611	2.709	0.056	0.110	8.600
Sego-lily	27.5	29.930	12.129	15.37	39.629	0.99	1.393	0.565	0.425	1.555	0.026	0.054	3.979
Unknown Aster	2.5	7.906	3.20377	-0.70	5.70367509	0.3	0.949	0.384	-0.084	0.684	0.008	0.005	0.634
Rabbit brush	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Smallseed falseflax	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Prairie Cone???	15	26.874	10.89	4.11	25.89	0.63	1.253	0.508	0.122	1.138	0.016	0.029	2.283
Birds foot	2.5	7.906	3.20377	-0.70	5.70367509	0.3	0.949	0.384	-0.084	0.684	0.008	0.005	0.634
Fringed Sage Wort	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Needle and thread	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Sandberg blue	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
yuka	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Loco Weed	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Falcada	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Prairie June Grass	32.5	35.463	14.367919	18.13	46.8679	1.5	1.581	0.641	0.859	2.141	0.039	0.064	8.128
Biscuit Root	15	26.874	10.89	4.11	25.89	0.9	1.449	0.587	0.313	1.487	0.023	0.029	2.636
onion grass	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Gay Feather	0	0.000	#NUM!	#NUM!	#NUM!	0	0.000	#NUM!	#NUM!	#NUM!	0.000	0.000	0.000
Woody Aster	30	40.825	16.545	13.46	46.545	0.66	1.228	0.502	0.158	1.162	0.017	0.059	3.790
Wild Onion	2.5	7.906	3.20377	-0.70	5.70367509	0.03	0.095	0.038	-0.008	0.068	0.001	0.005	0.204
Scurf Pea	20	32.914	13.339	6.66	33.339	2.6	6.240	2.529	0.071	5.129	0.067	0.039	8.309

Appendix II

Ground cover data

Site 1

Untreated Ground Cover

Microplot	1	2	3	4	5	6	7	8	9	10	Total	% Ground
Bare Soil	2	0	2	4	3	4	3	5	0	2	25	16.67%
Gravel/rock						1	1				2	1.33%
Moss											0	0.00%
Litter	7	4	2	0	5	5	5	2	5	4	39	26.00%
Basal Vegetation	6	11	11	6	7	5	9	5	11	13	84	56.00%
Wood					0	0	0	0	0	0	0	0.00%

Treated Ground Cover

Microplot	1	2	3	4	5	6	7	8	9	10	Total	% Ground
Bare Soil	3	6	5	7	6	4	4	5	4	5	49	32.67%
Gravel/rock											0	0.00%
Moss											0	0.00%
Litter	4	8	7	5	7	4	7	8	8	5	63	42.00%
Basal Vegetation	8	1	3	3	2	7	4	2	3	5	38	25.33%
Wood											0	0.00%

Site 2

Untreated Ground Cover

Microplot	1	2	3	4	5	6	7	8	9	10	Total	% Ground
Bare Soil	4	3	4	5	2	3	6	7	5	3	42	28.00%
Gravel/rock											0	0.00%
Moss											0	0.00%
Litter	9	7	9	9	11	9	8	6	1	10	79	52.67%
Basal Vegetation	2	5	2	1	2	3	1	1	7	2	26	17.33%
Wood					0	0	0	1	2	0	3	2.00%

Treated Ground Cover

Microplot	1	2	3	4	5	6	7	8	9	10	Total	% Ground
Bare Soil	7	1	4	2	4	2	8	1	2	5	36	24.00%
Gravel/rock											0	0.00%
Moss											0	0.00%
Litter	2	12	10	10	9	6	6	6	10	9	80	53.33%
Basal Vegetation	1	1	1	1	2	0	0	0	0	0	6	4.00%
Wood	5	1	0	2	0	7	1	8	3	1	28	18.67%

Site 3

Untreated Ground Cover

Microplot	1	2	3	4	5	6	7	8	9	10	Total	% Ground
Bare Soil	5	6	6	3	4	2	3	2	2	3	36	24.00%
Gravel/rock											0	0.00%
Moss											0	0.00%
Litter	6	5	6	9	7	5	9	7	8	5	67	44.67%
Basal Vegetation	4	4	3	3	2	4	1	2	3	3	29	19.33%
Wood					2	4	2	4	2	4	18	12.00%

Treated Ground Cover

Microplot	1	2	3	4	5	6	7	8	9	10	Total	% Ground
Bare Soil		4	2	2	6	4	9	3	4	4	38	25.33%
Gravel/rock											0	0.00%
Moss											0	0.00%
Litter	5		2	6	5	9	2	3	4	5	41	27.33%
Basal Vegetation		2	4	4	2	2	3	5	2	3	27	18.00%
Wood	10	9	7	3	2		1	4	5	3	44	29.33%

Site 4

Untreated Ground Cover

Microplot	1	2	3	4	5	6	7	8	9	10	Total	% Ground
Bare Soil	5	2	2	11	2	8	6	7	5	4	52	34.67%
Gravel/rock						0	0				0	0.00%
Moss											0	0.00%
Litter	7	1	4	3	7	4	6	3	7	6	48	32.00%
Basal Vegetation	3	10	5	1	2	3	3	5	1	5	38	25.33%
Wood		2	4	0	4	0	0	0	2	0	12	8.00%

Treated Ground Cover

Microplot	1	2	3	4	5	6	7	8	9	10	Total	% Ground
Bare Soil	2	8	9	3	9	9	5	7	6	4	62	41.33%
Gravel/rock											0	0.00%
Moss											0	0.00%
Litter	10	5	3	8	4	4	7	6	8	7	62	41.33%
Basal Vegetation	2	2	3	1	2	2	3	1	2	3	21	14.00%
Wood	1	0	0	2	0	0	0	1	0	1	5	3.33%

Site 5

Untreated Ground Cover

Microplot	1	2	3	4	5	6	7	8	9	10	Total	% Ground
Bare Soil	2	6	2	3	1	3	1	2	4	1	25	16.67%
Gravel/rock						0	0				0	0.00%
Moss											0	0.00%
Litter	11	9	12	12	14	11	10	10	9	11	109	72.67%
Basal Vegetation	2	0	1	0	0	1	4	3	2	3	16	10.67%
Wood					0	0	0	0	0	0	0	0.00%

Treated Ground Cover

Microplot	1	2	3	4	5	6	7	8	9	10	Total	% Ground
Bare Soil	7	3	3	2	5	3	3	2	4	9	41	27.33%
Gravel/rock											0	0.00%
Moss											0	0.00%
Litter	7	11	8	9	8	12	8	12	7	4	86	57.33%
Basal Vegetation	1	1	4	4	2	0	4	1	4	2	23	15.33%
Wood	0	0	0	0	0	0	0	0	0	0	0	0.00%

Site 6

Untreated Ground Cover

Microplot	1	2	3	4	5	6	7	8	9	10	Total	% Ground
Bare Soil	10	8	11	8	4	8	3	7	3	2	64	42.67%
Gravel/rock						0	0				0	0.00%
Moss											0	0.00%
Litter	0	4	1	5	4	4	1	6	1	5	31	20.67%
Basal Vegetation	5	3	3	2	7	3	11	2	11	4	51	34.00%
Wood					0	0	0	0	0	4	4	2.67%

Treated Ground Cover

Microplot	1	2	3	4	5	6	7	8	9	10	Total	% Ground
Bare Soil	2	7	8	7	9	6	5	5	4	2	55	36.67%
Gravel/rock											0	0.00%
Moss											0	0.00%
Litter	7	4	0	6	4	4	6	5	6	3	45	30.00%
Basal Vegetation	1	3	0	2	1	3	3	3	1	3	20	13.33%
Wood	5	1	7	0	1	2	1	2	4	7	30	20.00%